



U.S. Department of Health & Human Services

Food and Drug Administration

SAVE REQUEST

USER: (jsh)
FOLDER: K091496 - 520 pages
COMPANY: MIDWEST R.F. LLC. (MIDWRF)
PRODUCT: LASER, COMB, HAIR (OAP)
SUMMARY: Product: MEP-90 HAIR GROWTH STIMULATION SYSTEM

DATE REQUESTED: Jul 22, 2011

DATE PRINTED: Jul 22, 2011

Note: Printed



510(k) Summary

(as required per 21CFR; §807.92)

FEB 23 2010

MEP-90 Hair Growth Stimulation System

I. Applicant Midwest RF LLC
1050 Walnut Ridge Drive
Hartland, WI 53029 USA

Phone: (262) 867-8254
Fax: (262) 867-8554

II. Contact Name Helmut Keidl, President
helmut@midwestcomposite.com

III. Device Name

Proprietary Name MEP-90 Hair Growth Stimulation System
Common/Usual Name(s) Light Therapy Hair System
Classification Name Infrared Lamp per 21CFR 890.5500
Product Code(s) OAP; NHN

IV. Predicate Devices

<u>510(k) Number</u>	<u>Device</u>	<u>Manufacturer</u>
K060305	Hairmax Lasercomb	Lexington International LLC
K032816	Quantum Light Therapy System	Stargate International

VI. Indications For Use

The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

Medically prescribed use for the treatment of androgenic alopecia in females;

The treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

VII. Technological Characteristics

The MEP-90 is a stationary low-level laser device that promotes hair growth and provides treatment for androgenic (androgenetic) alopecia in females. The device provides automated and timed equal distribution of laser light to 100% of the scalp.

The MEP-90 operation is controlled by an operating system that affords the user maximum flexibility for individual treatments. The device applies a measured very high tolerance ($\pm 7.6\%$) wavelength (λ) to the scalp stimulating hair growth by the proven concept of biostimulation.

VII. Performance Data And Clinical Efficacy

A multi-phased experimental study was performed with Institutional Review Board (IRB) pre-approval and oversight, in accordance with all applicable references of the Food and Drug Cosmetic Act and Title 21; Code of Federal Regulations.

Androgenic alopecia in women is a chronic medical condition requiring diagnosis, treatment, and monitoring by a licensed medical physician. The condition in women demonstrates both physical and emotional symptoms, which requires addressing by a licensed medical professional.

For the MEP-90 efficacy determination, each subject received a total of 36 each, 20-minute treatments with the MEP-90, over a period of 18 weeks. Results were reviewed at the 10-Week (20 treatment) and 18-Week (36 treatment) levels.

After 20 treatments (10-Weeks), 92% of the subjects demonstrated an increased hair count of $\geq 10\%$ with 57% demonstrating an increase of $\geq 30\%$. 98% of the subjects indicated a medically significant stabilization of their rate of hair loss.

After the 36th treatment, 97% of the subject population demonstrated an increased hair count of $\geq 20\%$. A total of 89% of all subjects demonstrated an increased hair count of $\geq 30\%$, with 57% demonstrating an increased hair count of $\geq 50\%$.

87% of the subjects indicated the treatments have helped their condition, with 60% reporting their loss rate has further slowed down from the 10-week period, and 65% reported their visible area of the alopecia (bald spot) had gotten smaller.

100% of the linear trend plotting for all subjects of their Initial, 10-Week, and 18-Week hair counts demonstrated a historical rate of increased hair growth.

No subject experienced any adverse event and/or effect from the treatments.

VI. Substantial Equivalency

The MEP-90 is substantially equivalent to other pulsed therapeutic light therapy systems currently in commercial distribution. The MEP-90 has the same intended use to the predicate device approved for commercial distribution under 510(k) number K060305 and technological and safety characteristics to the predicate device approved for commercial distribution under 510(k) number K032816.

It exceeds the clinically accepted therapeutic results standards of FDA 510(k) K060305 previously approved light therapy system into a system which provides a more controlled application and larger treatment coverage area at no increased risk to the patient.

The technological equivalence to the predicate devices is substantiated by the wavelength and power output generated by the MEP-90. The MEP-90 provides expanded treatment benefits and regimens for clinical presentations already approved by the Food and Drug Administration for the predicate device.

The MEP-90 is as safe and effective as a combination of the predicate devices listed and numerous others. It has the same intended use of affecting hair growth as the hair growth predicate device (K060305). In addition, the MEP-90 has the same general indications, i.e., treating androgenic alopecia, and the same specific indication of promoting hair growth as the predicate device.

The MEP-90 also has many of the same or similar technological characteristics as a combination of its predicate devices. These include multiple lasers and visible laser wavelength.

The technological differences between the MEP-90 and its predicate devices, specifically the use of red laser to treat androgenic alopecia in females, does not raise new questions of safety or effectiveness for several reasons:

First, the safety and effectiveness profile of the type, wavelength, and power output of this type of laser is well established and previously cleared by the FDA.

Second, FDA's clearance of the predicate device with a much wider wavelength tolerances than the MEP-90's, confirms the favorable risk benefit ratio of visible lasers.

Third, the clinical data acquired confirms both the safety and effectiveness of the MEP-90 for prescription use in promoting hair growth in the intended patient population, despite the difference in technological characteristics between the MEP-90 and K060305. The data demonstrates clear statistical significance of the treatment results obtained and provide mathematical certainty that the results attained did not occur by chance.

These facts exceed FDA's substantial equivalence requirements with respect to the intended use, clinical efficacy, and technological characteristics of the MEP-90.

While there are some technological differences between the MEP-90 and its predicate devices, Midwest conducted an Institutional Review Board approved and monitored clinical study, with the MEP-90, to show that the device functions as intended for its proposed indication for use without any serious side effects or risks.

The clinical and effectiveness data demonstrates that the MEP-90 is effective in promoting hair growth, does not present any safety issues, is classified by the FDA as a non-significant risk (NSR) device, therefore the FDA should approve the medical device by approval of the 510(k).



Food and Drug Administration
10903 New Hampshire Avenue
Document Control Room W-066-0609
Silver Spring, MD 20993-0002

FEB 23 2010

Midwest RF, LLC
% Mr. Helmut Keidl
President
1050 Walnut Ridge Drive
Hartland, Wisconsin 53029

Re: K091496

Trade/Device Name: MEP-90 Hair Growth Stimulation System
Regulation Number: 21 CFR 890.5500
Regulation Name: Infrared lamp
Regulatory Class: Class II
Product Code: OAP
Dated: January 15, 2010
Received: January 20, 2010

Dear Mr. Keidl:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you; however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21

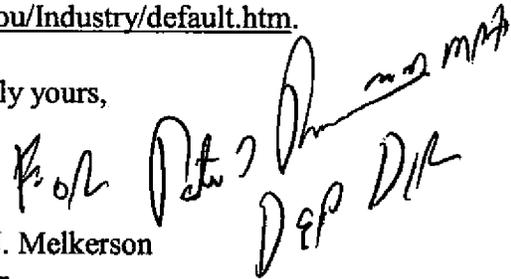
Page 2 - Mr. Helmut Keidl

CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please go to <http://www.fda.gov/AboutFDA/CentersOffices/CDRH/CDRHOffices/ucm115809.htm> for the Center for Devices and Radiological Health's (CDRH's) Office of Compliance. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Mark N. Melkerson". To the right of the signature, there are handwritten initials "MMA" and "DEP DIR".

Mark N. Melkerson
Director
Division of Surgical, Orthopedic
And Restorative Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

INDICATIONS FOR USE

510(k) Number: K091496

Device Name: MEP-90 Hair Growth Stimulation System

Indications For Use: The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

The treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

Prescription Use: **AND/OR** **Over The Counter Use:**
(Part 21 CFR 801 Subpart D)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)



(Division Sign-Off)
Division of Surgical, Orthopedic,
and Restorative Devices

510(k) Number 12091496



Midwest RF, LLC • 1050 Walnut Ridge Drive • Hartland, WI 53029
(262) 367-8254 • fax (262) 367-8544

K091496 / A1

September 14, 2009

FDA CDRH

SEP 16 2009

Received

Food and Drug Administration
Center For Devices and Radiological Health
Document Mail Center (HFZ-401)
9200 Corporate Boulevard
Rockville, MD 20850

ATTN: LTJG Atiq Chowdhury

Subject: Initial Response to Your 9/10/09 Letter Referencing 510(k) Submission K091946

Dear LTJG Chowdhury:

I am in receipt of your email and attachment titled "K091496 - AI_S1 (1).doc" of September 10th. My staff and I reviewed it along with all the correspondence between Midwest and the FDA to date. Please consider this correspondence as a partial response to your requests, with the full response to be submitted after our conference call.

We are convinced there exists significant misinterpretations between the FDA and Midwest over the contents and context of all the correspondence to date. I believe this was generated by our interpretation to follow FDA guidelines of the Least Burdensome Approach publication regarding the submission of excessive documentation that "would delay review of 510(k)s without contributing to the SE determination." I believe therein lies the basis for the misinterpretations.

Whereas the FDA clearly states "Clinical data are not required for most 510(k)s," we fully expected it was going to be required due to the current nature of the industry, its dubious, and questionable reputation, and its unregulated condition. Based on some of your comments in your September 10th letter, it would seem we are not far very apart on agreeing to that description.

Regardless, the standards I insisted my staff meet were that of evidenced based medicine (EBM). Our initial research found absolutely nothing that could come close to meeting the criterion for what is called "evidenced based medicine" (EBM). As you are aware, EBM far exceeds the standards necessary for meeting substantial equivalence (SE).

EBM aims to apply the best available evidence gained from the scientific method to medical decision making. It seeks to assess the quality of evidence of the risks and benefits of treatments (including lack of treatment).

EBM recognizes that many aspects of medical care depend on individual factors such as quality- and value-of-life judgments, which are only partially subject to scientific methods. EBM however, seeks to clarify those parts of medical practice that are in principle subject to scientific methods and to apply these methods to ensure the best prediction of outcomes in medical treatment, even as debate continues about which outcomes are desirable.

E3
297

I never intended for you to interpret our response to be a formal challenge of the legitimacy for a "double-blind, sham-control, and randomized clinical study" (placebo study). Based on the content of your September 10th letter, I can see where you did, and for that I sincerely apologize.

My intent was to put forth the rationale of a placebo study would not provide the necessary information for legitimate FDA approval, meeting EBM criterion, and would be extremely burdensome to the subjects, if not totally impossible to legitimately execute. Even if we somehow had successfully executed a placebo study, all we would have is data comparing the MEP-90's performance to "chance."

Before I would ever commit Midwest RF, or any other of the Midwest Group companies to any endeavor, it has to be based on far more than "chance." I wanted to know exactly what we would be getting into; therefore I sought out an Institutional Review Board (IRB) for guidance and oversight.

To achieve this end, I knew our efforts had to be didactic in nature. That is we also needed to determine what was required to support this product beyond just the design compliance to the safety and performance standards of 21CFR Part 1010 and SE.

Your statement on page 8 evidences this:

Further, all subjects treated in this trial were done so under the aegis of a single clinical investigator. It is possible that this clinician is substantially more familiar with the device than other clinicians would be if the device were cleared for use. It is possible that the use of the device by such other clinicians may lead to variations in safety and / or effectiveness, perhaps only in a learning curve of the first few subjects, perhaps of longer duration. By conducting the trial at only one site, with one clinical investigator, these possibilities cannot be adequately evaluated.

- My staff has engineering, design, product management, and FDA regulatory compliance experience in pulse-oximetry, patient monitoring, computerized tomography, magnetic resonance imaging, x-ray (portable to catheterization), nuclear medicine, diagnostic ultrasound, radiation therapy, radiation therapy simulation, and medical lasers.
- Dr. Koher, and the research staff had never seen or used the MEP-90s prior to the Study.
- Dr. Koher, and the research staff were all trained on the operation of the MEP-90 before using it on any subject.
- The MEP-90 is in full compliance with 21CFR Part 1010 with regards to performance and safety requirements for the lasers employed.

However, the Study confirmed to us the following few, of many, items pertaining to your comment that go beyond compliance. For example:

- 1) The MEP-90 systems will have to be installed by a certified installer
- 2) Formal user operation training will be required (either on-site or at factory)
- 3) Due to the high potential for misdiagnosis of androgenic (androgenetic) alopecia in women, the MEP-90 is labeled as a device that can only be used under the direction of a licensed physician. This is why we specifically noted the MEP-90 was a "Prescription Use" only device.
- 4) We will have to make our disclaimers and guidelines stronger about only using it for the specified "Indications For Use." Almost all states allow the practice of "evidence-based individual decision" (EBID) medicine. As you know this is medicine as practiced by the individual health care provider. We believe this is what you currently have in the laser hair-growth marketplace. Some believe it works and some don't. However, few if any can back up their decisions on why they use it or not.
- 5) Androgenic (androgenetic) alopecia in women is a genetic disorder. CDRH regulates "radiation emitting devices" like those Class IIIa (Class IIIr) lasers in the MEP-90 which generate an energy related reaction on tissue and cells within the human body, which is undoubtedly why they are regulated by CDRH. This makes all these devices actual medical devices and not cosmetic improvement devices.

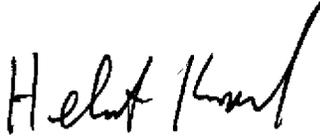
My staff and I look forward to the opportunity to discuss any items you would prefer in the conference call you scheduled for Thursday September 17th at 3:00PM Eastern. I assume we dial the number you provided at 3:00 Eastern promptly, then when prompted dial in the password. If that is not correct, please advise.

I also would like to know if there are specific items (agenda) that you wish to discuss so that we are properly prepared and whether you want us and/or you to record it. On page 1, I referred to "misinterpretations" and avoiding inundating FDA with "excessive documentation." On the following page, I am providing you with a documentation log of our efforts to date. These 3,342 files consisting of 7,025 pages represent at least 10GB of pertinent 510(k) data. Whereas we firmly believe the FDA has a right to review any or all of it, I hope you now understand why we only submitted a Study summary in our original 510(k).

We are committed to be totally open and cooperative with the FDA. Should you have any clarification needs, please feel free to contact me at anytime.

Respectfully yours,

Midwest RF LLC



Helmut Keidl
President

cc: Les Weinstein; CDRH Ombudsman

As of September 10, 2009

FINAL KEY RECORDS LOG Not Including Support Inserted Files, Art Work, etc.

#	Major Item Documentation Description*	Number of Files*	Document Pages	Document Format
(b)(4)		1	14	PDF
		7	7	PDF
		7	7	PDF
		1	20	PDF
		1	28	PDF
		2	106	PDF
		1	16	PDF
		1	12	PDF
		3	7	PDF
		245	1225	PDF
		171	1197	Paper
		63	378	PDF
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September 14, 2009

CDRH Ombudsman
Office of the Center Director (HFZ-5)
Center for Devices and Radiological Health
U.S. Food and Drug Administration
9200 Corporate Boulevard
Rockville, MD 20850

ATTN: Mr. Les Weinstein

Subject: FYI Concerning Dispute Regarding 510(k) Application K091496

Dr. Mr. Weinstein:

As Mr. Maher indicated you said would happen, I received a response from LTJG Chowdhury on September 10th. He sent it in email format, and I am enclosing a copy of my acknowledgment letter dated today.

I am sending it via email to insure your receiving it in a timely matter, but will also forward it in hard copy form.

Thank you for your follow-up.

Respectfully yours,

Midwest RF LLC

Helmut Keidl
President

Attachment

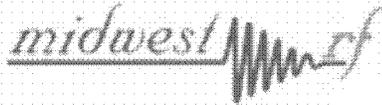
FDA CDRH OMC

SEP 16 2009

Received

K1

302



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September 14, 2009

Food and Drug Administration
Center For Devices and Radiological Health
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9200 Corporate Boulevard
Rockville, MD 20850

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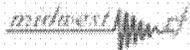
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3-3



510(k) K091946 Response

September 14, 2009

Page 2

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Respectfully yours,

Midwest RF LLC

Helmut Keidl
President

cc: Les Weinstein, CDRH Ombudsman



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(262) 367-8254 • fax (262) 367-8544

K09496/A2

October 1, 2009

CDRH Ombudsman
Office of the Center Director (HFZ-5)
Center for Devices and Radiological Health
U.S. Food and Drug Administration
9200 Corporate Boulevard
Rockville, MD 20850

FDA CDRH DMC

OCT - 5 2009

Received

(b)(4)



(b)(4)



(b)(4)

Respectfully yours,

Midwest RF LLC



Helmut Keidl
President



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(262) 367-8254 • fax (262) 367-8544

September 30, 2009

Food and Drug Administration
Center For Devices and Radiological Health
Document Mail Center (HFZ-401)
9200 Corporate Boulevard
Rockville, MD 20850

FDA CDRH DMC

OCT - 5 2009

Received

ATTN: LTJG Atiq Chowdhury

K-4

**Subject: Response to Your 9/10/09 Letter Referencing 510(k) Submission K091946
Responses To Our Teleconference Of September 17, 2009**

Dear LTJG Chowdhury:

I am in receipt of your email and attachment titled "K091496 - AI_SI (1).doc" of September 10th. I also wanted to express my appreciation for the teleconferencing session, with FDA Staff, on September 17, 2009.

My staff and I reviewed the two items above, along with all the correspondence between Midwest and the FDA to date. Please consider this correspondence as the response to your requests. Furthermore, to avoid any confusion, I have incorporated the contents of my six page email response dated September 14, 2009 into this document.

My staff and I interpreted our teleconference discussions to indicate no unresolvable issues and/or disagreements concerning the MEP-90 remain on our part. We did interpret your letter and the discussions to indicate your request(s) for several specific and additional documents pertaining to the Study, and certain responses to the issues we discussed.

Since your requests for additional data includes several significantly sized documents, I have prepared a "Table of Contents" for your ease of reference and use, which is located on Page 2. Please review and let me know immediately if we have misinterpreted and/or missed anything.

Respectfully yours,

Midwest RF LLC

Helmut Keidl
President

cc: Les Weinstein; CDRH Ombudsman

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Point-By-Point Response To Your Letter of September 10, 2009

Page 2; ¶2 Issue:

- A. Please provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. Also, please include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile).

Response: Please refer to our revised Device Comparison Table.

Page 2; §6 continued thru Page 3; ¶1 Issue:

Comment 1: There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.

Response(s): As I stated in my attachment of September 14th, I never intended for you to interpret our response to be a formal challenge of the legitimacy for a "double-blind, sham-control, and randomized clinical study" (placebo study). Based on the content of your September 10th letter, I can see where you did, and for that I again apologize.

My intent was to put forth the rationale of a placebo study would not provide the necessary information for legitimate FDA approval, meeting EBM criterion, and would be extremely burdensome to the subjects, if not totally impossible to legitimately execute. Even if we somehow had successfully executed a placebo study, all we would have is data comparing the MEP-90's performance to "chance."

Before I would ever commit Midwest RF, or any other of the Midwest Group companies to any endeavor, it has to be based on far more than "chance." I wanted to know exactly what we would be getting into; therefore I sought out an Institutional Review Board (IRB) for guidance and oversight.

To achieve this end, I knew our efforts had to be didactic in nature. That is we also needed to determine what was required to support this product beyond just the design compliance to the safety and performance standards of 21CFR Part 1010 and SE.

Except for age and pregnancy, the medical history, the Ludwig Scale, and the Savin Scale established the "control group" by eliminating all variables (bias), which could have contributed to errors in assessment whether that would be in the diagnosis or the observed results.

There is no natural phenomenon, or other natural cause(s), which impacts hair growth on this disease as classified by the World Health Organization (WHO) of which the United States is a member nation. In addition, androgenic (androgenetic) alopecia in women is a chronic genetic disorder. CDRH regulates "radiation emitting devices" like those Class IIIa (Class IIIr) lasers in the MEP-90 which generate an energy related reaction on tissue and cells within the human body, which is undoubtedly why they are regulated by CDRH. This makes all these devices actual medical

devices and not cosmetic improvement devices. This is also confirmed in the response to "Page 8; ¶1 Response.

Unlike the Study concerning K060305, we administered all treatments on the subjects versus assuming that the subjects rigidly adhered to the usage called for in the enclosed documentation, which is a possible bias based on improper usage of K060305. All subjects formally acknowledged their prohibition of usage of any chemicals and/or other treatments during the course of the Study.

Page 4; ¶3 Issue:

Comment 2: (a) A large proportion of subjects screened were not accepted (82 accepted out of 157 screened). It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. (b) In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. (c) It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, (d) in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

(a) A large proportion of subjects screened were not accepted (82 accepted out of 157 screened). It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled.

Response(s): Originally it was planned that we would commence the actual study upon obtaining 80(±5) qualified subjects. Due to advertising restrictions, the acquisition of qualified subjects was much slower than anticipated.

The IRB approved a targeted Study population of 80, with the restriction of no less than 50 for each phase. The first individual screened was on June 27, 2008.

Whereas it was assumed the first treatment date would be in early July 2008, the first treatment was not administered until August 12, 2008. Due to IRB restrictions in advertising, our prohibition of any and all compensation being given to the subjects (a definite bias), and timing some already approved subjects dropped out before the Study (first treatments) began.

Since your letters, another and more comprehensive audit was conducted of all "Screening Files." Several discrepancies were found, however none of those discrepancies involved the obtained Study data published. As stated, the screening process could not and did not begin until after receipt of the Study's Certificate of Approval by the IRB (June 2008).

The results of the more detailed and comprehensive audit were as follows:

(b)(4)

As previously stated, the files were limited in access and deletion required a specific password. To track advertising results, a new file was generated if a response (phone call) was received. If they were determined to be unqualified during the phone call, these became "Screening" Records Not Used (Blanks).

If the potential subject made an appointment, but did not show up for screening, they were classified as "Screening" Records Generated For Appointments But Did Not Show.

In accordance with HIPAA, names were not recorded unless candidate showed up for screening.

171 potential subjects had Screening forms generated. 82 of the potential subjects were excluded based on the following:

Total Screened	171
Excluded For Informed Consent Issues	5
Excluded For Medical History Issues	57
Excluded For Ludwig and/or Savin Scales Issues	14
Excluded For Fitzpatrick Skin Typing Issues	2
Excluded For Physical Examination Issues	4
Total Subjects Who Met Criterion For Study	89

Each of the subjects "excluded" were sent a letter indicating they did not meet the Study criterion. There were no letters sent neither regarding a possible pregnancy nor referring them to their personal physician based on findings in the physical examination as called for in the protocol if warranted.

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)		1		1			
		1		1			
		1		1			
		1		1			
		1	1	1			
		1		1			
		1		1			
		1		1			
		1		1			
		1				1	1
		1				1	
		1		1			
		1		1			

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)		1		1			
		1			1		
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		1			1		
		1		1			
		1			1		
		1		1			
		1					1
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ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(4)							
		1					1
		1		1			
		1		1			
		1		1			
		1				1	
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ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)							
					1		
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		1				1	
		1		1			
		1		1			

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)							

Phase 1 Results:

No.	ID#	Initial	10-Week	Gain/Loss		Hair Growth	Hair Growth
		Hair Count	Hair Count	Gain/Loss	Percent	≥10%	≥20%
(b)(6)		78	104	26	33%	✓	✓
		103	138	35	34%	✓	✓
		52	149	97	187%	✓	✓
		64	100	36	56%	✓	✓
		11	33	22	200%	✓	✓
		92	136	44	48%	✓	✓
		55	74	19	35%	✓	✓
		57	96	39	68%	✓	✓
		22	29	7	32%	✓	✓
		65	51	-14	-22%		
		82	131	49	60%	✓	✓
		105	121	16	15%	✓	✓
		41	87	46	112%	✓	✓
		59	107	48	81%	✓	✓
		80	114	34	43%	✓	✓
		82	91	9	11%	✓	✓
		65	92	27	42%	✓	✓
		102	121	19	19%	✓	✓
		42	54	12	29%	✓	✓
		77	122	45	58%	✓	✓
		77	98	21	27%	✓	✓
		81	131	50	62%	✓	✓
		109	135	26	24%	✓	✓
		77	112	35	45%	✓	✓
		85	132	47	55%	✓	✓
		81	116	35	43%	✓	✓
		95	134	39	41%	✓	✓
		65	81	16	25%	✓	✓
		76	90	14	18%	✓	✓
		95	99	4	4%		
		95	165	70	74%	✓	✓
		52	72	20	38%	✓	✓
		103	161	58	56%	✓	✓
		63	110	47	75%	✓	✓
		67	84	17	25%	✓	✓
		92	101	9	10%	✓	✓
		80	113	33	41%	✓	✓
		81	99	18	22%	✓	✓
		114	114	0	0%		
		85	90	5	6%		
		39	66	27	69%	✓	✓
		101	103	2	2%		
	99	151	52	53%	✓	✓	
	65	89	24	37%	✓	✓	
	79	100	21	27%	✓	✓	
	121	147	26	21%	✓	✓	
	44	58	14	32%	✓	✓	
	75	119	44	59%	✓	✓	
	100	128	28	28%	✓	✓	
	84	97	13	15%	✓	✓	
	98	126	28	29%	✓	✓	
	82	147	65	79%	✓	✓	

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No.	ID#	Initial	10-Week	Gain/Loss		Hair	Hair
		Hair Count	Hair Count	Gain/Loss	Percent	Growth $\geq 10\%$	Growth $\geq 20\%$
(b)(6)		95	154	59	62%	✓	✓
		88	104	16	18%	✓	✓
		88	133	45	51%	✓	✓
		62	82	20	32%	✓	✓
		134	161	27	20%	✓	✓
		85	104	19	22%	✓	✓
		55	79	24	44%	✓	✓
		102	132	30	29%	✓	✓
		58	137	79	136%	✓	✓
		93	130	37	40%	✓	✓
		82	170	88	107%	✓	✓
Totals						58	50
Percent						92%	79%

The Study's criterion called for uninterrupted treatments which are no different than certain antibiotics and/or other medical treatments that mandate full adherence to dosage regarding amounts and over a designated period of time.

(c) It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, (d) in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

Response: As was previously stated, 63 subjects commenced Phase 2 (18 Weeks) of the Study, with 60 of them completing Phase 2 (18 Weeks).

Subjects Who Started Phase 2 of Treatments	63
(b)(6)	1
.....	1
.....	1
Subjects Who Completed Phase 2 of Treatments (18 Weeks)	60

The efficacy data for the 510(k) submission was based on the subjects adherence to the protocol mandates. There was no overestimation as at the end of 10-weeks, the dropped subjects had attained:

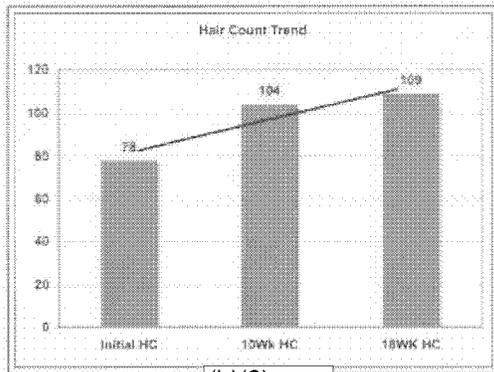
- (b)(6)
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Phase 2 Results:

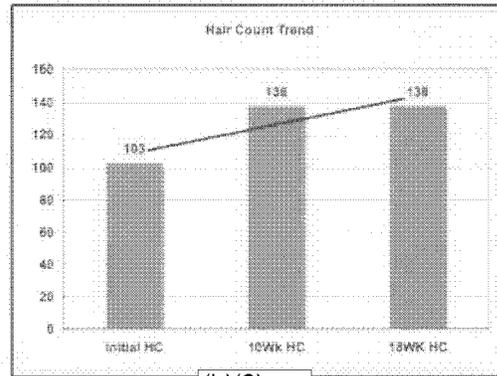
No. ID#	Initial	18-Week	Gain/ Loss	Gain/ Loss %	Hair Count ≥20%	Hair Count ≤20%	HC	HC	HC	Hair Count ≥51%
	Hair Count						20% To 30%	31% To 40%	41% To 50%	
(b)(6)	78	109	31	40%	✓					
	103	138	35	34%	✓					
	52	114	62	119%	✓					
	64	121	57	89%	✓					
	11	22	11	100%	✓					
	92	139	47	51%	✓					
	55	117	62	113%	✓					
	57	91	34	60%	✓					
	22	29	7	32%	✓					
	65	98	33	51%	✓					
	82	174	92	112%	✓					
	105	141	36	34%	✓					
	41	102	61	149%	✓					
	59	131	72	122%	✓					
	80	117	37	46%	✓					
	82	111	29	35%	✓					
	65	132	67	103%	✓					
	102	134	32	31%	✓					
	42	60	18	43%	✓					
	77	109	32	42%	✓					
	77	110	33	43%	✓					
	81	148	67	83%	✓					
	109	134	25	23%	✓					
	77	123	46	60%	✓					
	85	156	71	84%	✓					
	81	144	63	78%	✓					
	95	186	91	96%	✓					
	65	111	46	71%	✓					
	76	120	44	58%	✓					
	95	127	32	34%	✓					
	95	146	51	54%	✓					
	52	77	25	48%	✓					
	103	151	48	47%	✓					
	63	95	32	51%	✓					
	67	93	26	39%	✓					
	92	105	13	14%	✓					
	80	92	12	15%	✓					
	81	129	48	59%	✓					
	114	154	40	35%	✓					
	85	133	48	56%	✓					
	39	46	9	23%	✓					
	101	131	30	30%	✓					
	59	Deceased	After	Phase 1						
	65	125	60	92%	✓					
	79	117	38	48%	✓					
	121	154	33	27%	✓					
	44	Dropped	Out	After	Phase 1					
	75	145	70	93%	✓					
	100	230	130	130%	✓					
	84	103	19	23%	✓					
	98	153	55	56%	✓					
	82	170	88	107%	✓					
	95	210	115	121%	✓					

No. ID#	Initial Hair Count	18-Week Hair Count	Gain/Loss	Gain/Loss %	Hair Growth $\geq 20\%$	Hair Growth $\leq 20\%$	HG 20% To 30%	HG 31% To 40%	HG 41% To 50%	Hair Growth $\geq 51\%$
(b)(6)	88	140	52	59%	✓					
	82	92	30	48%	✓					
	134	190	56	42%	✓					
	55	Removed	Missed	Treatments						
	55	117	62	113%	✓					
	102	153	51	50%	✓					
	58	133	75	129%	✓					
	93	181	88	95%	✓					
	82	232	150	183%	✓					
Totals					58	2	5	10	9	34
					% = 97%	3%	8%	17%	15%	57%

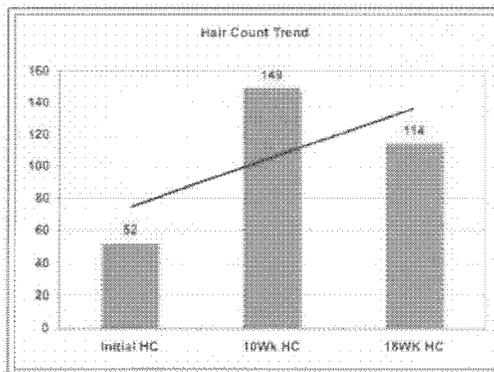
Phase 2 Historical Linear Trends



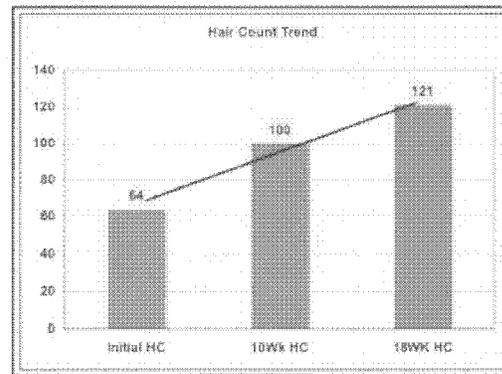
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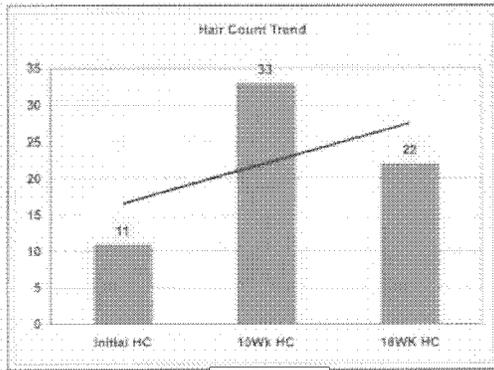


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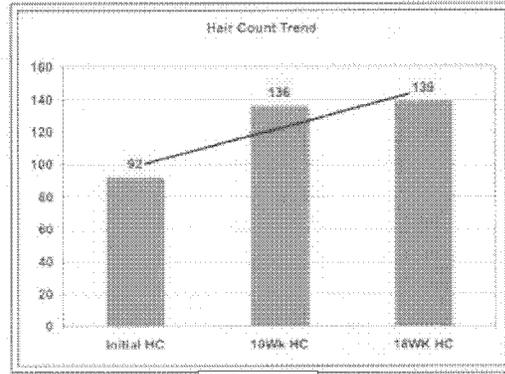


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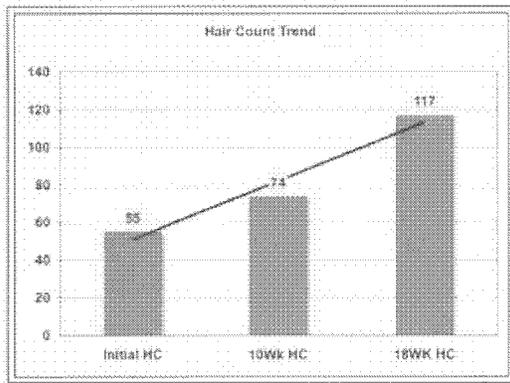
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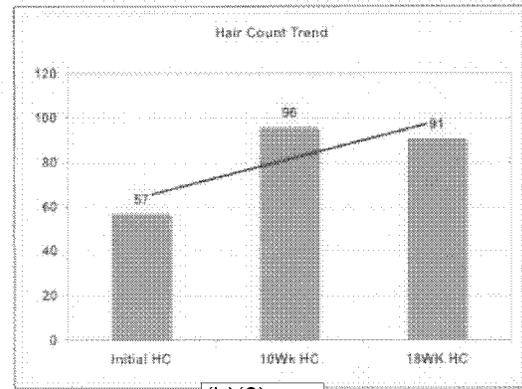
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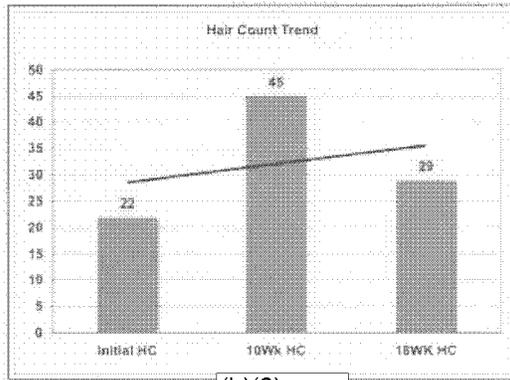
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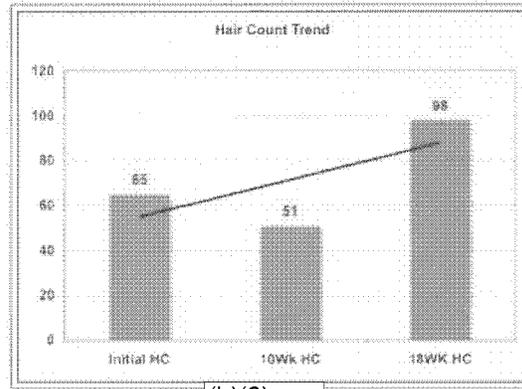
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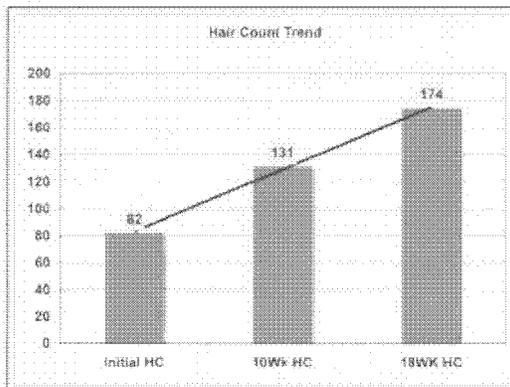
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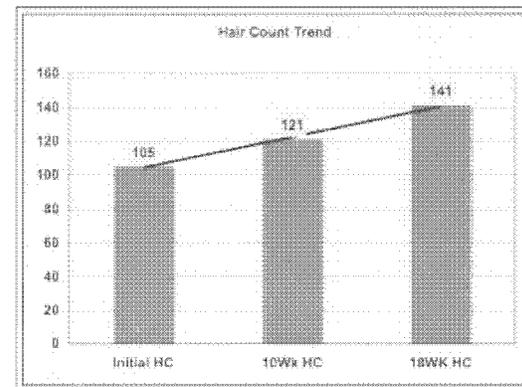
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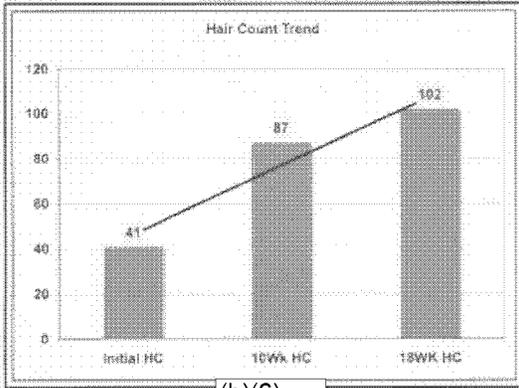


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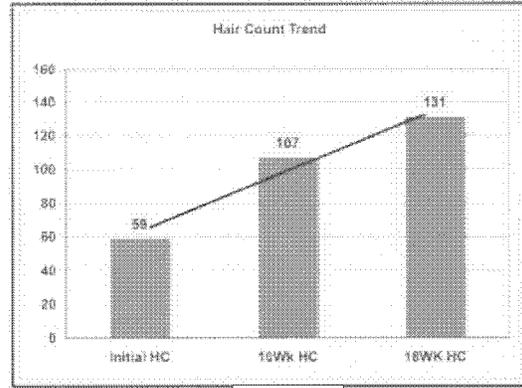


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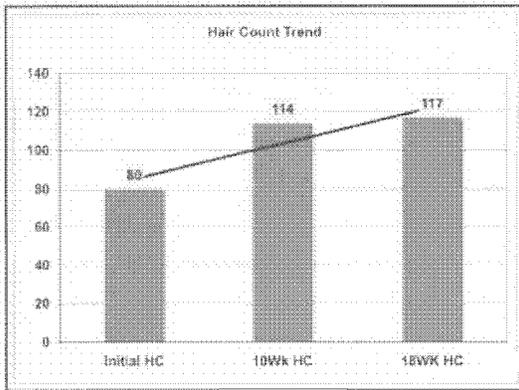
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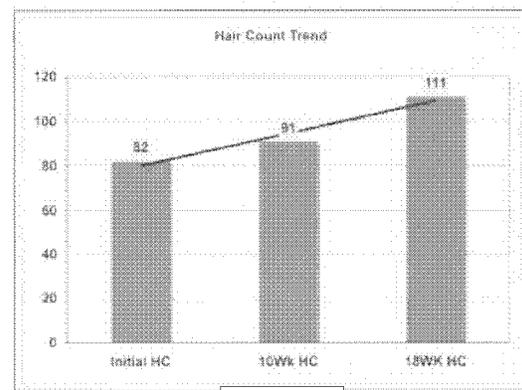
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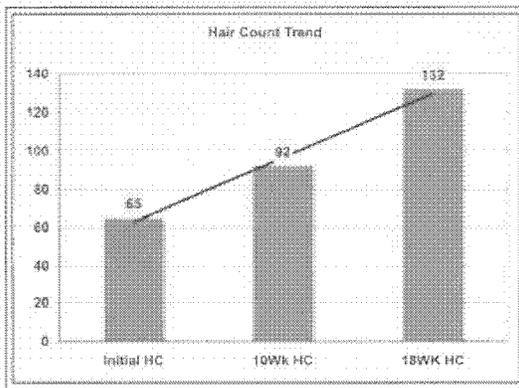
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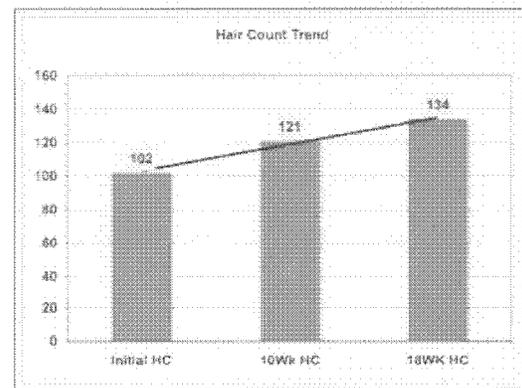
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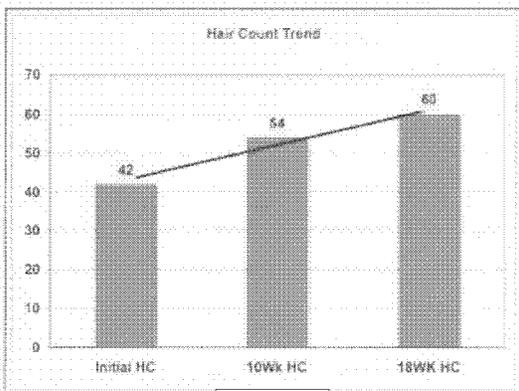
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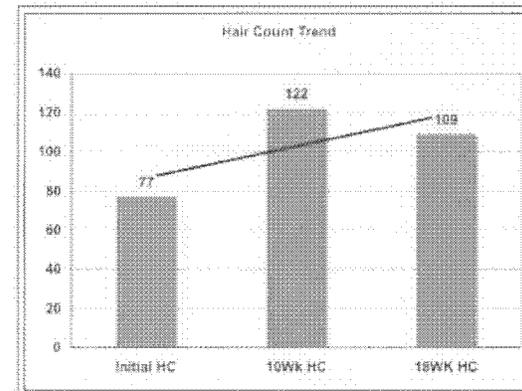
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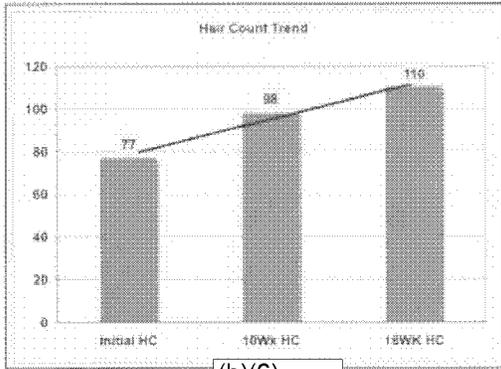


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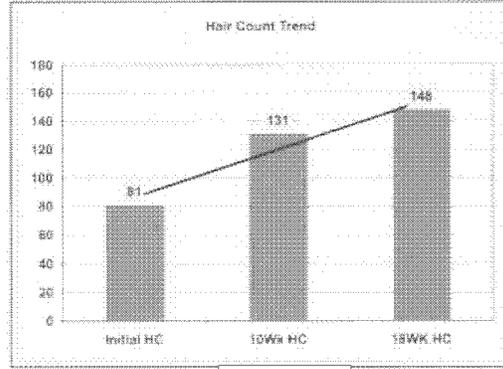


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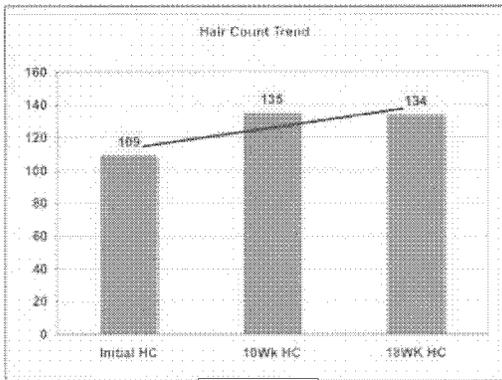
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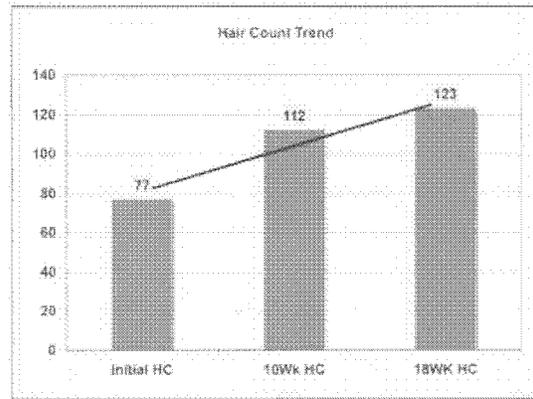
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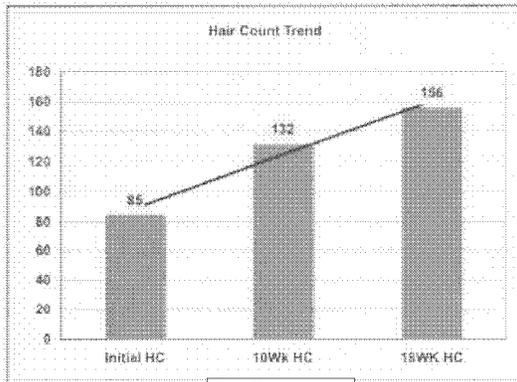
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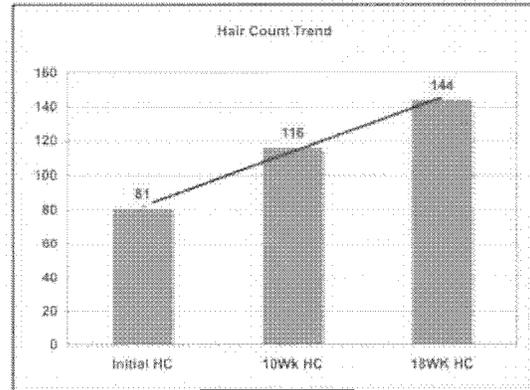
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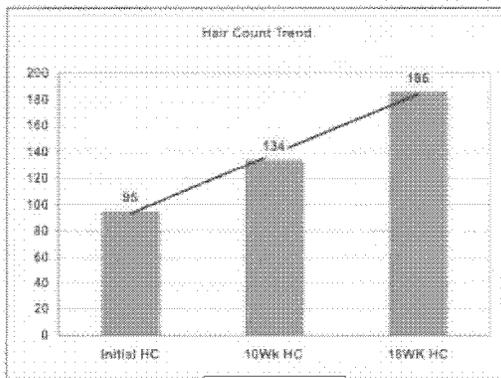
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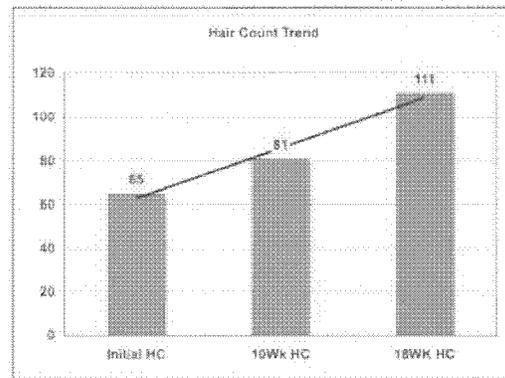
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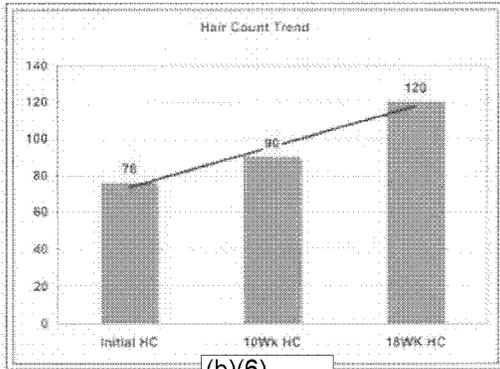


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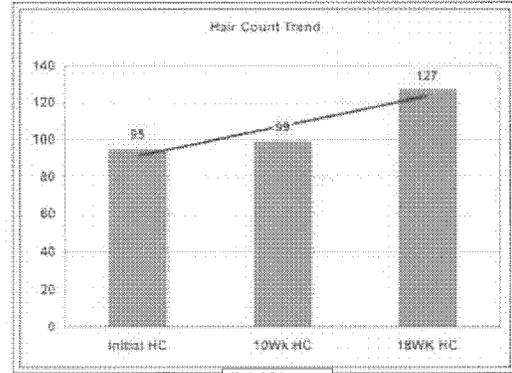


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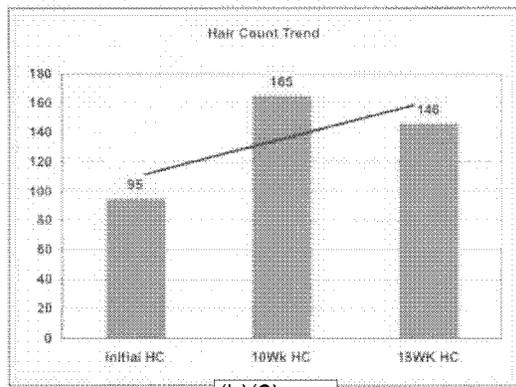
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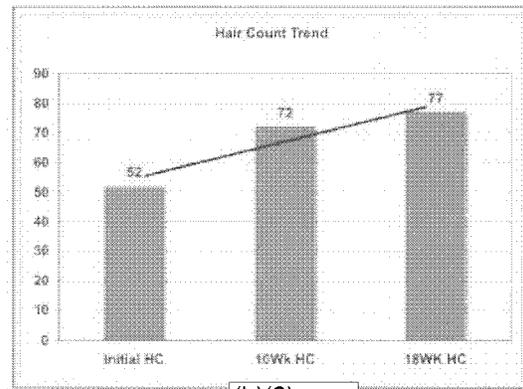
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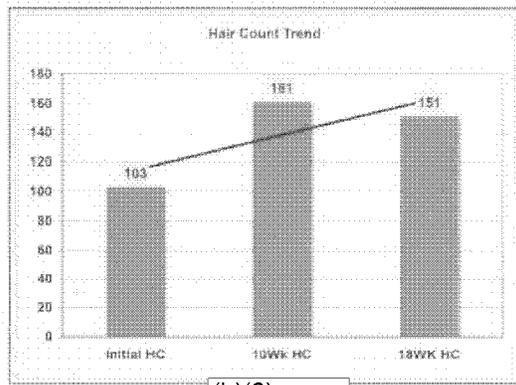
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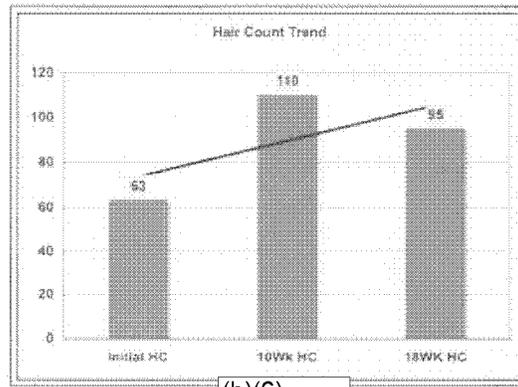
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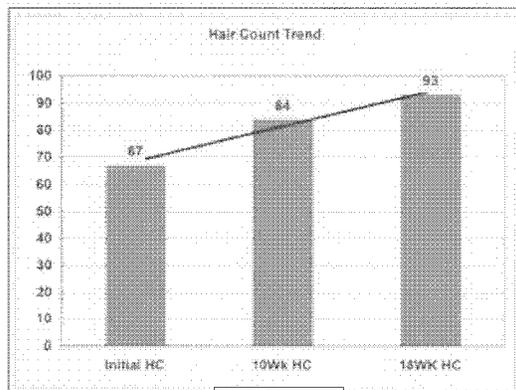
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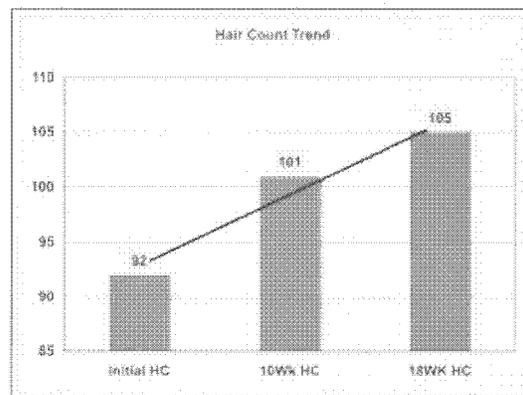
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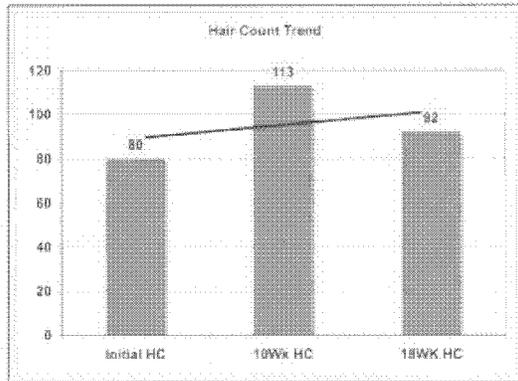


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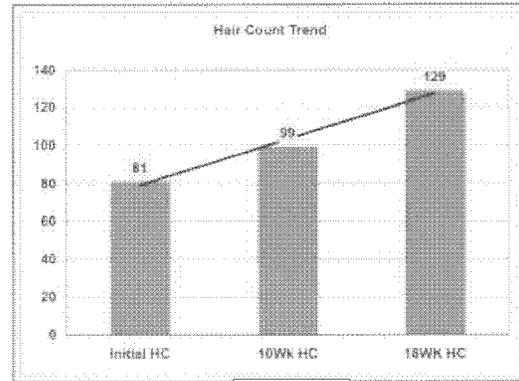


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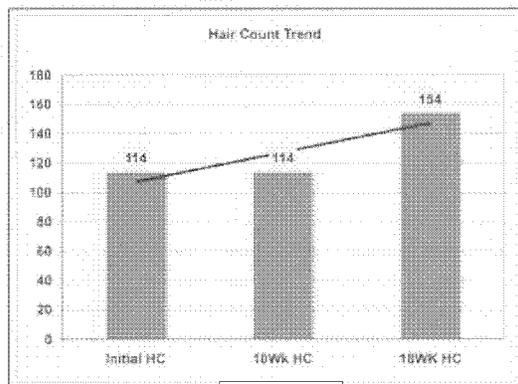
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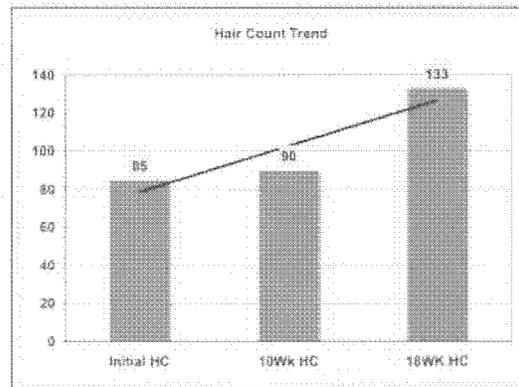
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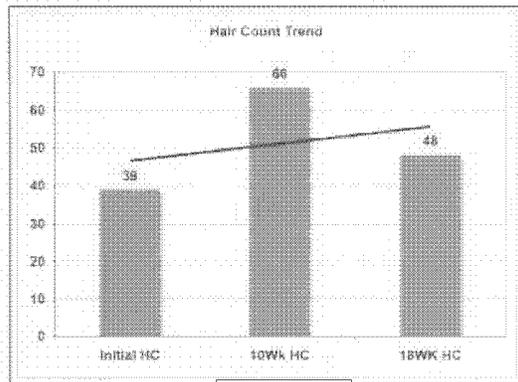
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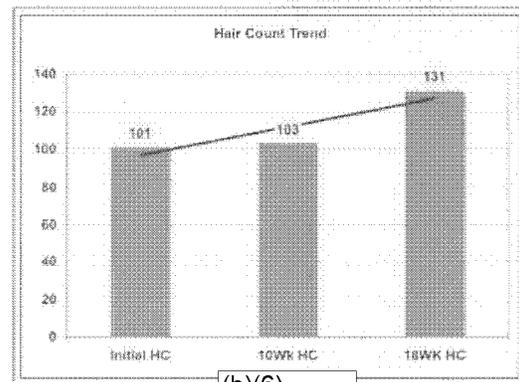
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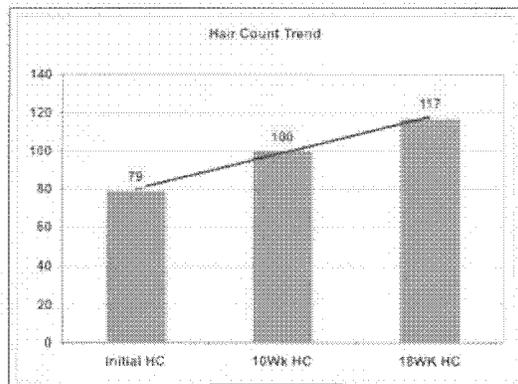
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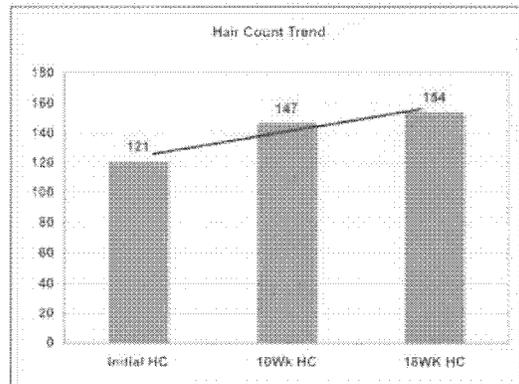
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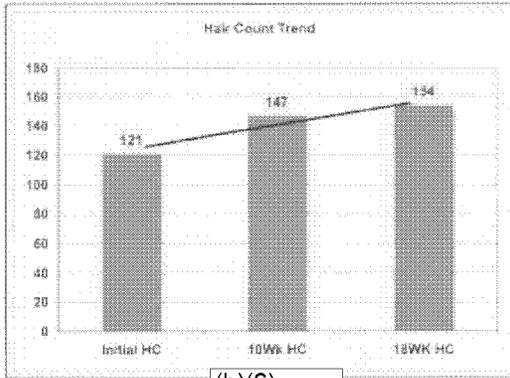
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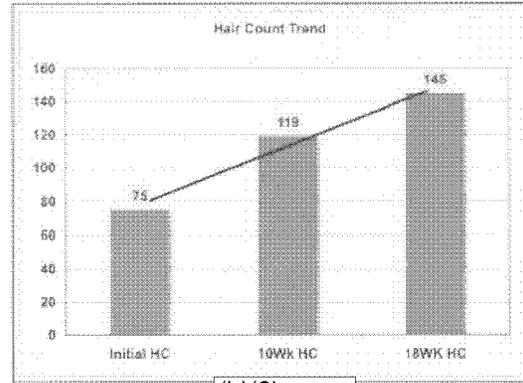
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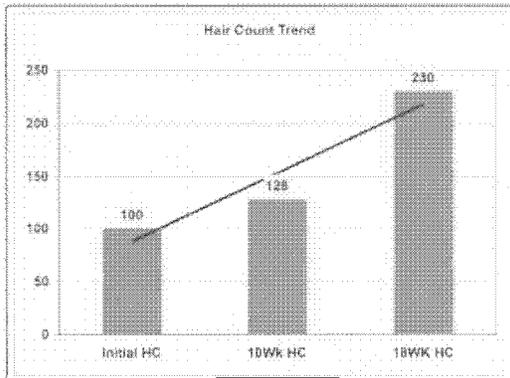
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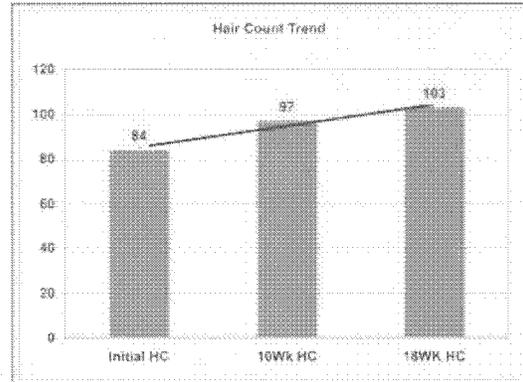
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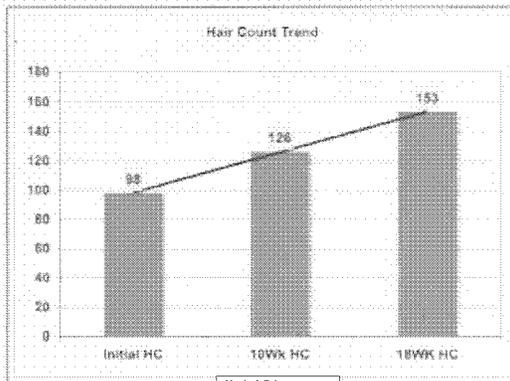
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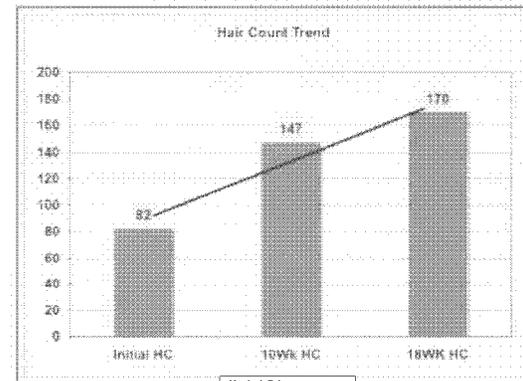
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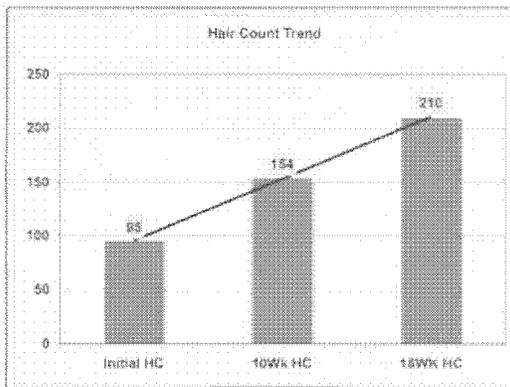
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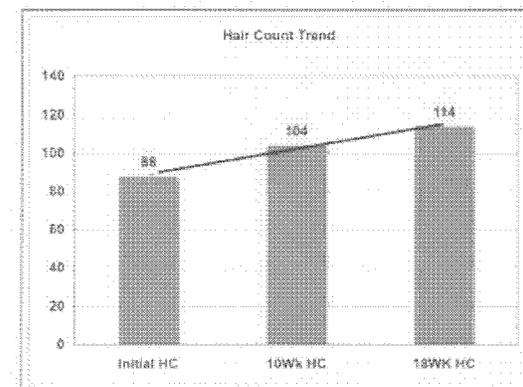
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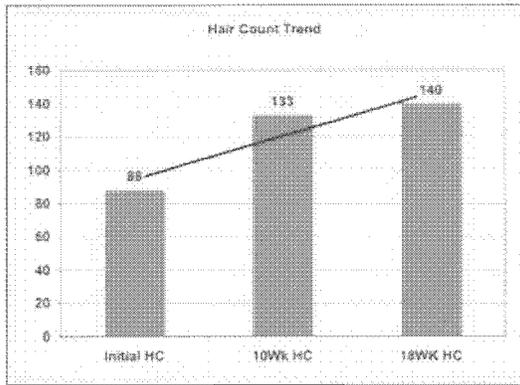


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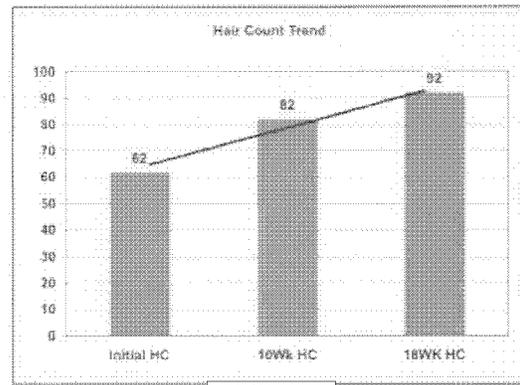


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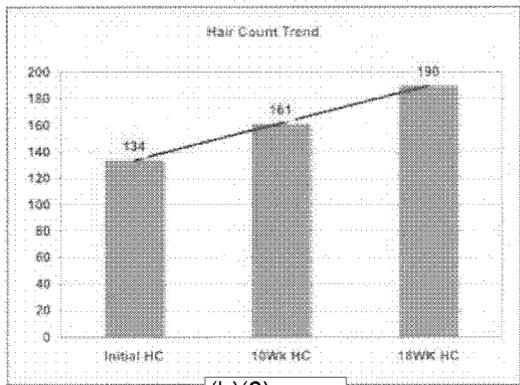
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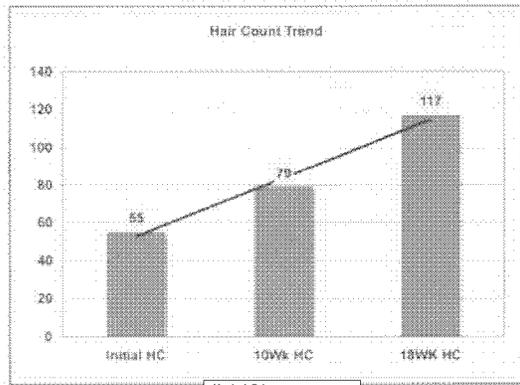
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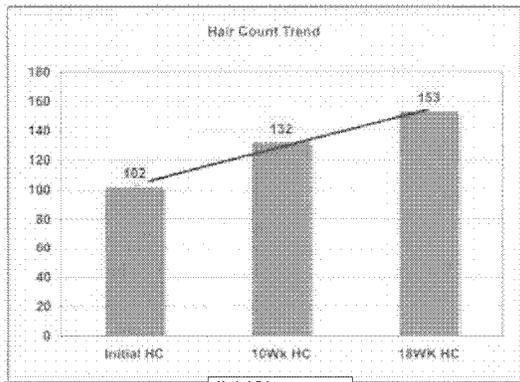
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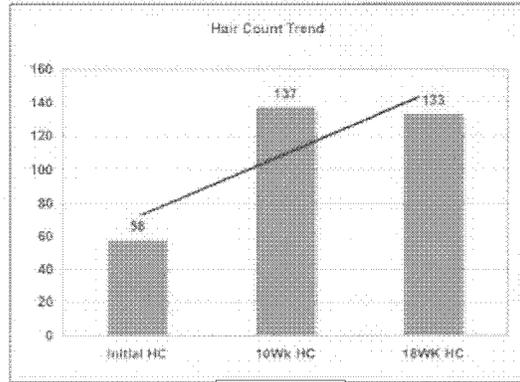
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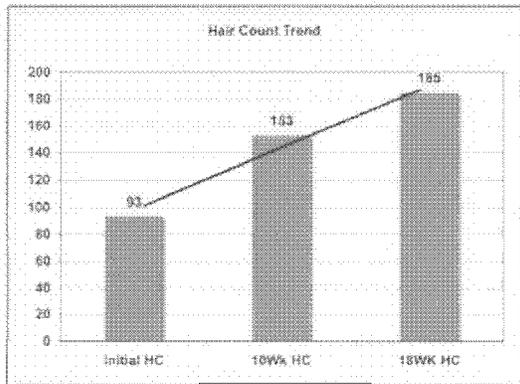
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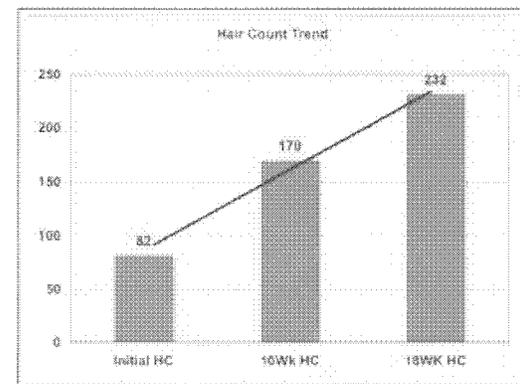
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(b)(6)



(b)(6)



(b)(6)

Page 7; ¶1 Issue:

Comment 3: The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.

Response: I am somewhat confused as you stated concerning our hair count methods provided: "The information provided adequately addresses the statistical reviewer's concerns on this point."

However, on page 11, #7 you stated: "Please provide clarification on your Hair Count Method." I will provide additional specificity on our entire hair count procedures which is located in **Page 11; ¶4 Issues.**

Page 7; ¶5 Issue:

Comment 4: The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

Response: As we discussed in the teleconference, all treatments were conducted at the clinical site located in High Point, NC. The subject population was from an area of not more than a 50-mile radius from the clinic.

Page 8; ¶1 Issue:

For example, subjects treated at a single site are likely to be more homogeneous than the broader population in terms of variables such as: race, ethnicity, income, skin type, etc. To the extent that any of these variables is associated with responsiveness to the device or compliance with the treatment regimen, these issues are highly relevant.

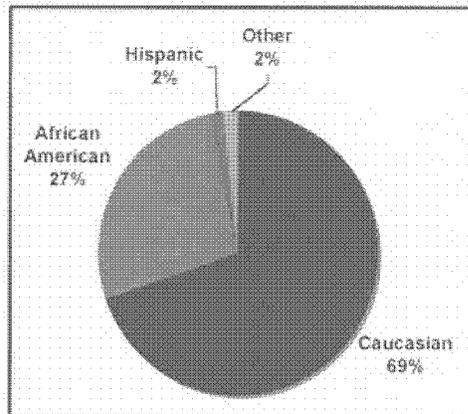
Response: Androgenic (androgenetic) alopecia in females, like males, is a genetic disorder. It is a disorder that affects approximately 27 million women throughout the United States. The *experimental* study was executed using the MEP-90 Hair Growth Stimulation System to treat females between 18-60 years of age who had been diagnosed with androgenic (androgenetic) alopecia and had both a Ludwig and Savin Female Hair Loss Scale classifications of I to II and a Fitzpatrick Skin Types I to IV (population).

There are several "non applicable to treatment response" variables due to ethnicity, but they do not apply to this Study or the MEP-90's medical usage. The Fitzpatrick Skin Typing is a variable related to laser safety and our compliance with 21CFR §1010. Admittedly, the population breakdown by skin type may vary by geographical location, but skin typing is a safety parameter versus a medical one and is not a factor of the disorder, nor impacts its severity and symptoms. Regardless, we tracked the study population by Fitzpatrick Skin Typing.

To insure integrity, we did not arbitrarily exclude any subject who met the skin type criteria as did predicate device K060305. As an indicator of our accuracy exceeding their study, I provide the following from their website:

Lexington limited the skin types for the laser hair growth treatment study to Fitzpatrick I to IV to facilitate the hair counting process. It is difficult to count dark hairs on dark skin and therefore the darker Fitzpatrick skin types (V and VI) were not included in the study.

Fitzpatrick Skin Typing is not an indicator of skin color. The color of the skin is only one of 10 factors that determine the Fitzpatrick Skin Typing classification. The darkest skin score of "4" would only represent 13% of the highest Fitzpatrick Skin Type classification ((IV= score of 26 to 30). Our ethnic breakdown of the subject population was as follows:



We based our qualification strictly on the actual Fitzpatrick score versus skin color.

In addition, I call your attention to the; The International Statistical Classification of Diseases and Related Health Problems 10th Revision Version for 2007 which does not classify androgenic alopecia as a geographical and/or sociological variable disease. See Page 8; ¶6 Issues

Page 8; ¶2 Issue:

Further, all subjects treated in this trial were done so under the aegis of a single clinical investigator. It is possible that this clinician is substantially more familiar with the device than other clinicians would be if the device were cleared for use. It is possible that the use of the device by such other clinicians may lead to variations in safety and / or effectiveness, perhaps only in a learning curve of the first few subjects, perhaps of longer duration. By conducting the trial at only one site, with one clinical investigator, these possibilities can not be adequately evaluated.

Response:

- My staff has engineering, design, product management, clinical research, clinical application/instruction and FDA regulatory compliance experience in pulse-oximetry, patient monitoring, computerized tomography, magnetic resonance imaging, x-ray (portable to catheterization), nuclear medicine, diagnostic ultrasound, radiation therapy, radiation therapy simulation, and medical lasers.

- The clinical effectiveness of all medical devices is dependent upon its proper usage which are factors of design, product support, and in the case of the MEP-90, compliance with 21CFR §1010. The only variation would be the degree of accuracy of the diagnosis, which is never the responsibility of any manufacturer unless it is a diagnostic device.
- This statement also suggests you are searching for a subjective rationale to disapprove the 5150(k) application for the MEP-90. I say that because we provided a copy of the current version of our MEP-90 Operation Manual which attests to the system's ease of use, yet no comments, criticisms, and/or change recommendations of the Manual have been presented.
- Dr. Koher, and the research staff had never seen or used the MEP-90s prior to the Study.
- Dr. Koher, and the research staff were all trained on the operation of the MEP-90 before using it on any subject (3 hours).
- The MEP-90 is in full compliance with 21CFR Part 1010 with regards to performance and safety requirements for the lasers employed.

However, the Study confirmed to us the following few, of many, items pertaining to your comment that go beyond compliance. For example:

- 1) The MEP-90 systems will be installed by a certified installer
- 2) Formal user operation training will be made available (either on-site or at factory)
- 3) Due to the high potential for misdiagnosis of androgenic (androgenetic) alopecia in women, the MEP-90 is labeled as a device that can only be used under the direction of a licensed physician. This is why we specifically noted the MEP-90 was a "Prescription Use" only device.
- 4) We will have to make our disclaimers and guidelines stronger about only using it for the specified "Indications For Use." Almost all states allow the practice of "evidence-based individual decision" (EBID) medicine. As you know this represents is medicine as practiced by the individual health care provider. We believe this is what you currently have in the laser hair-growth marketplace. Some believe it works and some don't. However, few if any can back up their decisions on why they use it or not.
- 5) Androgenic (androgenetic) alopecia in women is a genetic disorder. CDRH regulates "radiation emitting devices" like those Class IIIa (Class IIIr) lasers in the MEP-90 which generate an energy related reaction on tissue and cells within the human body, which is undoubtedly why they are regulated by CDRH. This makes all these devices actual medical devices and not cosmetic improvement devices.

Page 8; ¶2 Issue:

This issue is reflected in both the E9 guideline "the subjects in the trial should ... mirror the target population" (Section II B (2.2.1)) as well as the CDRH statistical guidance: "the study population should be a representative subset of the population targeted for the application of the medical device.

Response: A 510(k) is the establishment of substantial equivalence (SE) and not a clinical trial as specified by conducting a PMA. The study population of MEP-90-CDA not only mirrors the one used in K060305, it establishes a higher degree of safety and effectiveness than the predicate without raising any new questions concerning either.

Page 8; ¶3 Issue:

Indeed, the E9 guideline states that one of the two main reasons for multicenter trials is to "provide a better basis for the subsequent generalization of its findings. This arises from the possibility of recruiting subjects from a wider population and of administering the medication in a broader range of clinical settings, thus presenting an experimental situation that is more typical of future use."

Response: There is no clinical and/or historical evidence that indicates the above applies to androgenic alopecia. The actual diagnoses of the disorder has no geographical or financial variables and is not a medication. The disorder is symptom specific and does not vary by location. Again, The International Statistical Classification of Diseases and Related Health Problems 10th Revision Version for 2007 which does not classify androgenic alopecia as a geographical variance disease.
See Page 8; ¶6 Issues

Page 8; ¶6 Issues:

3. Indications for Use—Need for Clinical Data

Your proposed indication for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," is not the same as predicate K060305's indications for use. Your claim for the treatment of females with androgenetic alopecia is not the same as predicate K060305's claim for treatment of males. In addition, your device has an indication for "reduce rate of hair loss in females," where as K060305 does not have a reduce hair loss claim in their indications for use.

Response: Medicine has a long and well-documented history of physical and genetic disorders that manifest themselves differently between the sexes, yet are classified as the same affliction. This applies for the treatment of androgenic alopecia.

The ICD is the international standard diagnostic classification for all general epidemiological, many health management purposes and clinical use. These include the analysis of

the general health situation of population groups and monitoring of the incidence and prevalence of diseases and other health problems in relation to other variables such as the characteristics and circumstances of the individuals affected, reimbursement, resource allocation, quality and guidelines.

It is used to classify diseases and other health problems recorded on many types of health and vital records including death certificates and health records. In addition to enabling the storage and retrieval of diagnostic information for clinical, epidemiological and quality purposes, these records also provide the basis for the compilation of national mortality and morbidity statistics by WHO Member States.

The International Statistical Classification of Diseases and Related Health Problems 10th Revision Version for 2007 classifies androgenic alopecia as a "disease of the skin and subcutaneous tissue" and can be found in Chapter XII (L00-L99). The ICD-10 designations are L64 thru L64.9.

This would confirm that any legitimate treatment of this disease must be done by a classified medical device and by a licensed physician.

The differences between the Indications For Use for the MEP-90 and K060305 have absolutely no bearing on the disease or its treatment. Thus, a new device with the same intended use as a predicate device may have different specific indication statements, and, as long as these label indications do not introduce questions about safety or effectiveness different from those that were posed by the predicate device's intended use, the new device may be found SE.

Indication/Difference	MEP-90	K060305
Causes of androgenic alopecia as a chronic and/or genetic disease	Identical to K060305	Identical to the MEP-90
Use of the adjective "adjunctive"	The variations of the level of affliction mandate physicians' option of which treatment to use based on Evidence Based Medicine	Incorrectly suggests the device is the panacea for reintroducing hair growth
Initial location of hair loss	Circular and/or linear effect at the crown	M shaped and receding hairline at forehead
Visual Classification Chart used to determine the degree of hair loss	The Ludwig and the Savin charts which are for females only	Norwood-Hamilton chart which is for males only
Fitzpatrick Skin Typing Classification	Exceeds usage mandates as published by manufacturer of K060305	Same chart as by MEP-90 but manufacturer indicated it was biased. (see Page 8: #1 Issue)
Reduction of Hair Loss	(b)(4)	

Page 8; ¶7 Continued Thru Page 9; ¶1 Issues:

Your device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, whereas K060305 is a comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

Response: We have no issue with providing the FDA with the necessary data to validate the design differences raise no new questions on safety and effectiveness. However, through all correspondence you have yet to provide any questions concerning a specific criterion being met concerning a specific issue of "safety and/or effectiveness."

As with many chronic diseases of the human body, the treatments given are palliative. Whether it is a life threatening disease like coronary artery disease or a non life threatening one like androgenic alopecia, there is no "cure." In addition, the degree of success (reduction of symptoms) with all palliative treatment protocols will vary from patient to patient due to many factors.

Again, I cite the rationale for evidenced based medicine (EBM), and the current state of this technology mandates the critical need for EBM. Again, the FDA states:

...Thus, as a matter of practice, CDRH generally considers a device to be SE to a predicate device if, in comparison to the predicate device:

- the new device has the same intended use; and,
- the new device has the same technological characteristics, (i.e., same materials, design, energy source, etc.); or, it has new technological characteristics that could not affect safety or effectiveness; or
- it has new technological characteristics that could affect safety or effectiveness, and
- there are accepted scientific methods for evaluating whether safety or effectiveness has been adversely affected as a result of the use of new technological characteristics; and
- there are data to demonstrate that the new technological features have not diminished safety or effectiveness.

Our compliance with 21CFR §1010 is the validation standard for safety since the device is a Class 111a (Class IIIr) laser system. However, as I provided an example in my first response, there are variations of that system being sold, delivered, and treating patients in the United States (approximately 8,000-10,000) by non-medical personnel and these systems are not in compliance with 21CFR §1010.

This brings us to the "evaluation of effectiveness." Your initial determination of our study design was only from a statistical aspect of determination based on our not executing a placebo study. In other words, your determination criterion was based strictly on the fact that is what K060305 executed versus making a determination of MEP-90 effectiveness based on EBM.

(b)(4)



The safety of the MEP-90 is validated by our compliance to 21CFR; §1010.

Page 9; ¶2 Issue:

Regarding your reduce rate of hair loss in females claim, this indication for use must be removed or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

Response: This Indication For Use was one of the four basic hypotheses to be confirmed by the Study. However, the characteristics of the disease make it impossible to determine what the rate of hair loss in either men or women at anytime or in any manner except historical. That is because the blood levels of testosterone and the corresponding amount of the anagen dihydrotestosterone (DHT) can change on a daily basis in both men and women.

We have no issue with providing the clinical data, but your determination that our clinical study, "would require a lead in period to first determine what is an individual normal rate of hair loss before treatment in order to show an effect on the rate of hair loss," is an incorrect, prejudicial, subjective, and an erroneous demand that has no basis in medical fact or relativity to the disease of androgenic alopecia.

The progression of this disease has been established with the Ludwig Scale and the Savin Scale which are medically accepted principles. For the disease of androgenic alopecia, these two scales represent progression indicators without treatment for this chronic disease. That is to say that a female who today is a Type I on the Ludwig Scale will eventually progress to a Type IV or a Type V.

This medical progression description is no different than say one for coronary artery disease (CAD). While the progression of what will occur with an individual with CAD is known, the rate of progression will vary by subject and from subject to subject.

Regardless, we stated this Indication For Use based on the following nine (9) types of evidentiary data:

- 1) As provided on pages 18 and 19, at the end of the 18-weeks of treatments, the hair counts of all but two subjects exceeded 20%. The two subjects who did not exceed a 20% increase (b)(6) demonstrated an increase of 14% and 15% respectively. Therefore, at the 18-week level 100% of the subjects demonstrated no increase in measurable hair loss.
- 2) As provided on pages 19 thru 26, 100% of all subjects demonstrated an upward historical linear growth trend of hair count.
- 3) At the 18-week level, just prior to the 20th treatment, all subjects, who were unpaid volunteers, were provided the following questionnaire, and I call your attention to the results for Question #3:

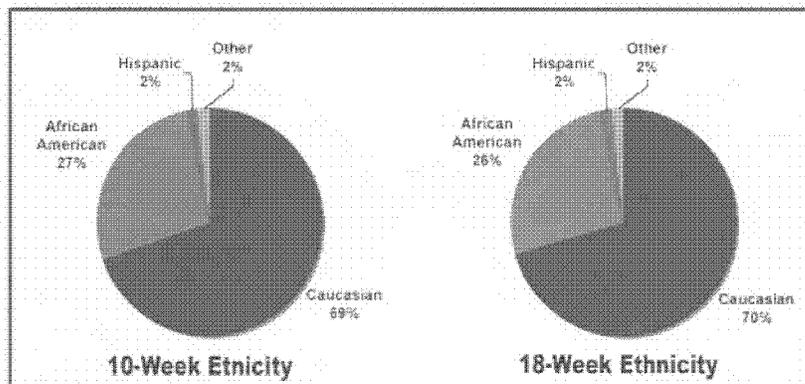
(b)(4)

Questionnaire Item	Number	Percentage
<i>Question #3: Since starting the treatments, do you feel the area on your scalp with the visible hair loss is:</i>		
<i>Larger</i>	0	0%
<i>Smaller</i>	39	65%
<i>About The Same</i>	21	35%
Totals	60	100%

Although one subject felt their rate of hair loss had increased, 100% of all subjects indicated their hair loss had either reversed itself (smaller) or ceased (about the same).

- 4) The Phase 2 Hypothesis of "more than 50% of the subjects will demonstrate an increased hair count of $\geq 20\%$ at the 18-week level was confirmed. This confirmation is based on the evidence:
- 97% of the subjects demonstrated an increased hair count of $\geq 20\%$
 - 3% of the subjects demonstrated an increased hair count from 0% to 19%
 - 0% of the subjects demonstrated additional hair loss

- 5) There was no significant change ($\pm 2\%$) to the ethnicity distribution from Phase I.



- 6) All subjects who completed the 18-Week level were analyzed and scored according to the following:

(b)(4)

(b)(4)

- 7) A total of 55 subjects completed the Phase 3; 26-Week level of treatments (52). All 55 women demonstrated no increase in hair loss:

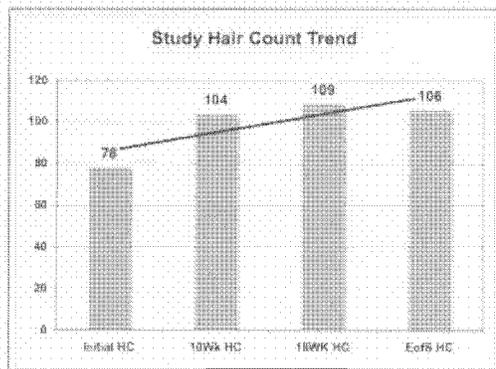
Phase 3 Subject Hair Count Distributions	Number	Percentage
Hair growth between $\leq 1\%$ to 19%	3	5%
Hair growth between 20% to 30%	4	7%
Hair growth between 31% to 40%	2	4%
Hair growth between 41% to 50%	6	11%
Hair growth $\geq 51\%$	40	73%
Total	55	100%

- 8) The three subjects who had to be excluded for excessively missed treatments, the one who developed a work conflict (transfer); and the one who decided to become pregnant had 10-week and 18-week hair counts as follows:

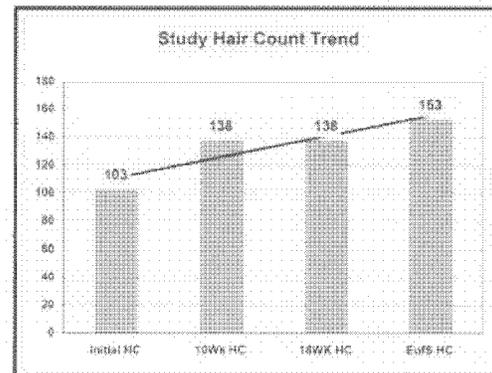
(b)(6)

(b)(4)

- 9) All 55 subjects who completed the 26-Week level demonstrated a positive historical linear trend of hair growth. For example:



(b)(6)



(b)(6)

Page 9; ¶3 Issue:

3. Clinical Protocol Package

Please provide the entire clinical protocol package which includes the statistical success hypothesis used in this clinical study.

Response: Please refer to Pages 51 thru 85.

Page 9; ¶4 thru Page 10; ¶2 Issues:

5. Indications for Use Clarification

The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

Your response points out that concurrent alternative therapy was an exclusion criterion of the trial.

This issue is highly relevant to the trial, particularly given that the clinical data submitted arise from an un-blinded, non-randomized, single-arm trial. As such, had any subjects been using a concurrent alternative therapy in addition to the investigational treatment, it would have confounded the results and made the evaluation of any improvement impossible to attribute to the investigational device, the concurrent treatment, or a possible interaction between the two. This question arose due to the apparent discrepancy between the proposed indications for use (allowing concurrent alternative therapies) and the clinical data submitted in support of this proposed indication (which excluded subjects with concurrent alternative therapies). Ideally, the trial should enroll and treat subjects as closely as possible to the intended indications for use.

In the absence of any clinical data on subjects treated with concurrent therapy, it is extremely difficult for FDA to evaluate the appropriateness of this proposed indication for use. The only clinically valid interpretation possible would be that the device is safe and effective when used as a monotherapy. There is no data to support its use in addition to other treatments, which may alter the safety and / or effectiveness of the investigational device.

- Please address this issue, given that the study population (women not using concurrent therapy) appears to be different from the intended target population (women who may or may not be using concurrent therapy).

Response: This contradictory statement causes my staff and I great concern over the objectivity being employed during the review of our 510(k) application.

(b)(4)

[Redacted area]

We administered each and every treatment whereas K060305 "took the word" of their subjects that they used their device three times per week and it was never published what controls, if any, were instituted to insure it was K060305 that stimulated hair growth versus a combination of K060305 and another therapy, i.e., Rogaine, Propecia, etc.

Your statement creates a "Catch-22" situation that goes beyond the scope of the 510(k) process. We conducted a legitimate and IRB sanctioned clinical study to validate if the MEP-90 is as safe and effective as the predicate device K060305. If we did not control/prohibit the use of concurrent therapy, our Study results would have been biased because we did not control the known variables. It is the physician who decides what treatment, and/or what combination of treatments thereof to use, not the manufacturer of medical devices.

If we had allowed concurrent therapies, statistically our Study would have been invalid, the hypotheses not legitimately confirmed, and no "stand alone" effectiveness of the MEP-90 could be legitimately presented.

Page 10; ¶3 thru ¶5 Issues:

3. Clarification on Data Sets

The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

You state that this information was available in the original submission, but failed to provide a page number reference. You then state that they feel this question "insinuates multiple criminal allegations of noncompliance."

This question regards the issue of analysis datasets. Virtually every clinical trial submitted for FDA review clearly delineates multiple analysis datasets. These typically consist of:

- A safety dataset, used for adverse event analysis and consisting of all subjects enrolled in the trial.
- A full analysis or intent to treat dataset, used for the primary effectiveness analysis and consisting of all subjects randomized to receive treatment.
- A per protocol dataset, used to replicate the primary effectiveness analysis and consisting of all subjects in the intent to treat dataset who meet pre-defined protocol adherence criteria.

Response: Whereas we have no contention of providing the FDA these specifics as requested, we do wonder what are the reasons for 21CFR and 45CFR's establishment and sanctioning of Institutional Review Boards if their processes have no relevance to the FDA.

Again, you make reference to the term "clinical trial" which is relevant to a PMA than a 510(k) SE effectiveness study.

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First, we did not limit the reported adverse events/incidents to those who completed the Study. All subjects who dropped out after treatment #1 were contacted by a Research Coordinator or a Research Assistant as to their reasoning, and/or problem, for not making the scheduled treatment appointment and/or not continuing with the Study. Not one "after starting then excluded" subject reported an adverse event.

Second, there were a total of three items/incidents reported during the course of the Study:

(b)(4)

Third, the data for full analysis of all candidates is submitted and located on pages 5 thru 9 and pages 10 thru 15.

Page 10; ¶6 thru Page 11; ¶3 Issues:

The protocol submitted did not make any mention of which analysis dataset(s) were generated, nor how many subjects were in each. It is therefore not clear, for example, whether the 22 subjects who were initially enrolled but did not complete the trial were included in the safety analysis. The safety analysis essentially states that no adverse events were reported. Nevertheless, the denominator of how many subjects this statement covers is highly relevant. This question was not an "insinuation" that the sponsor had broken the law; it was a simple request for clarification on information that every other trial submitted to the Agency routinely provides in recognition of its importance in evaluating the data submitted. If this information was provided in the original submission, a page number reference to that effect would have sufficed. If not, a statement documenting which subjects the safety / adverse event data was based on would have been sufficient. The data provided states that 19 subjects were excluded from the trial after being enrolled, and another 3 removed between the first and final evaluations, but does not state whether these subjects were included in the safety analysis (a valid question, particularly as they were excluded from the effectiveness analysis.) It is unclear whether these subjects were ever treated or not.

As stated in the E9 guideline "the protocol should also specify procedures aimed at minimizing any anticipated irregularities in study conduct that might impair a satisfactory analysis, including various types of protocol violations, withdrawals, and missing values" (Section V, part B (5.2))

- Please clarify which subjects were assessed in the safety analysis; e.g., all screened subjects, all enrolled subjects, all subjects who were evaluated at the first assessment, all subjects who were evaluated at the second assessment, etc.

Response: All individuals who set foot on the clinical site were included in the safety analysis and the adverse reports/incidents system.

Prior to the filing with the IRB, both the Sponsor's and the Principal Investigator's liability carriers were contacted for verification of coverage during the course of the Study. North Carolina law requires physician ownership of any clinical practice. Since the Raleigh surgical site was located "inside another business," only the High Point clinic could be used. This was due to the fact that the physical location where treatments were to be administered was not under the direct control of the Principal Investigator.

As part of the IRB filing and the protocol, exclusionary criterion was provided in the following categories:

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Page 11; ¶4 Issue:

7. Clarification on Hair Count Method

From your explanation of your hair count method beginning on page 25 of your response to our AI Letter Dated July 22, 2009, it appears that the head was divided into quarters with multiple photographs being taken of each quarter. But on page 26, there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. It is unclear what is meant by the phrase "count photo," since it appears all photos were being counted. In addition, this method seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Thus, depending on how this process is interpreted it seems that for each individual, up to 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. If this assumption is correct, what method was used to insure that baseline and follow-up photographs were identical in terms of scalp area viewed within each photograph. Please provide clarification on your Hair Count Method.

Response: Through the course of the Study, a total of four (4) microscopic photographs were taken and used for hair counting. These .95cm x .75cm images were taken at the following times:

- 1) Just prior to treatment #1
- 2) As part of treatment #20 (10-Weeks)
- 3) As part of treatment #36 (18-Weeks)
- 4) As part of treatment #62 (26-Weeks)

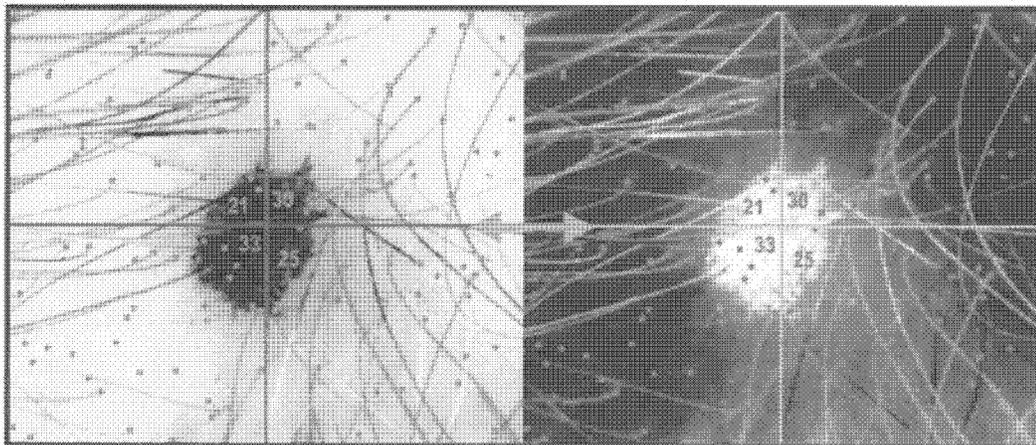
As a member of my staff reiterated during the teleconference, we believe there is no other way of legitimately determining the actual hair count except by physical counting.

As part of my August 19th submission, I presented a hair count photo taken and processed with the following explanation:

The microscopic imaging generated a raw image in "jpg" format. The raw image size generated was 17.778" wide by 14.222" tall with a dpi of 72. Using Adobe Photoshop v8.0, the microscopic photo sizes were changed to 6" wide by 4.81" tall with a dpi of 266. All raw images are archived in their original format with the processed images being archived using the "Save As" command.

Note: If you are familiar with Photoshop usage, the photo itself does not change with the steps taken above since only the width and dpi were changed and the height is done automatically to maintain proportion.

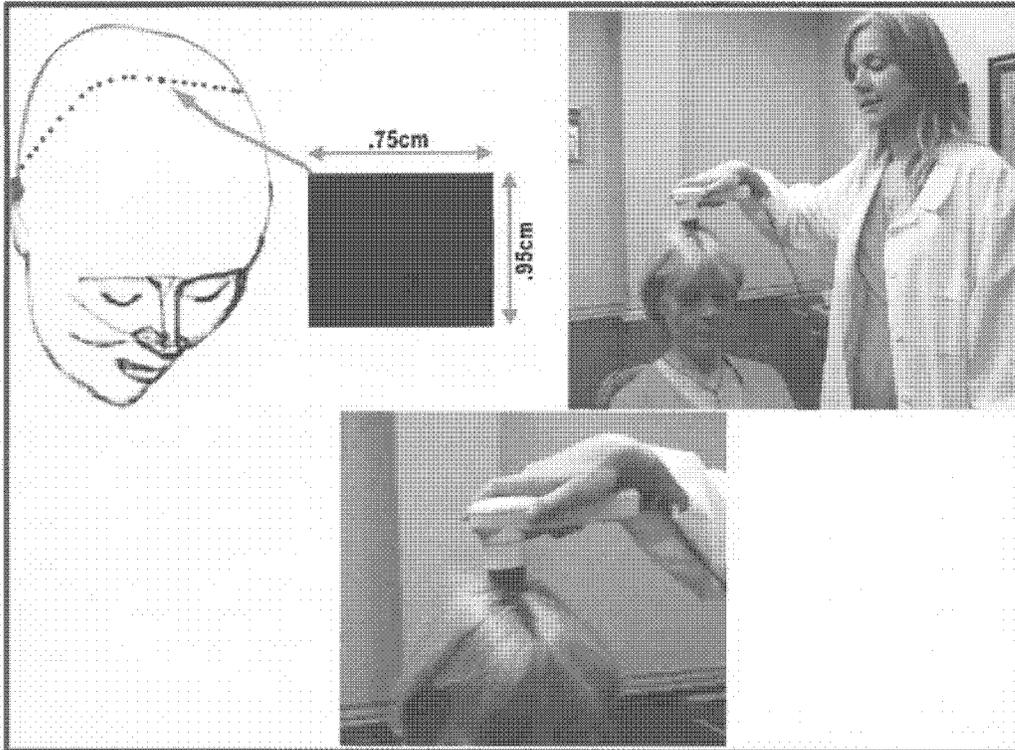
No image software adjustments were made, the only processing capability used was to invert the image if the hair coloring required it for viewing the individual hairs.



Note: The above is two images are exact duplicates, i.e., same one hair count photo placed side-by-side. The reference to the quadrant only meant it was a "counting aid." If you add the four numbers, (b)(4) hair count of 109 for this one image. In this case, the photo was that of (b)(6) taken at the end of 18 weeks.

Again, from my August 19th submission:

The method devised of marking the areas to be measured is as follows: sitting upright in a chair, head neutral position, eyes forward, a line drawn from the topmost portion of the pinna (ear) vertically over the scalp to the topmost portion of the opposite pinna (ear), intersected with a line drawn in the midline of the scalp, oriented from the glabella to the nuchal ridge. An indelible dot was placed at this intersection with a sharp tip permanent marking pen, which the subjects agreed to in their Informed Consent Form.

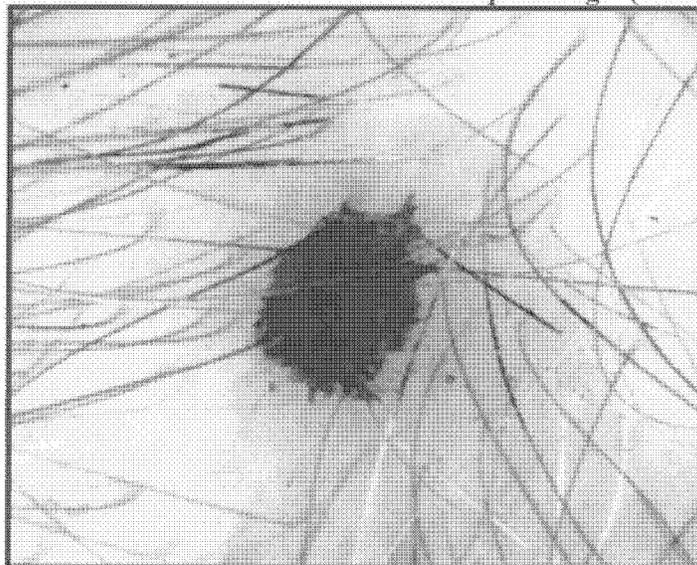


Note: All photos were taken on the subject's left side with the camera handle centered on the subject's left ear with the reference dot in the middle of the frame.

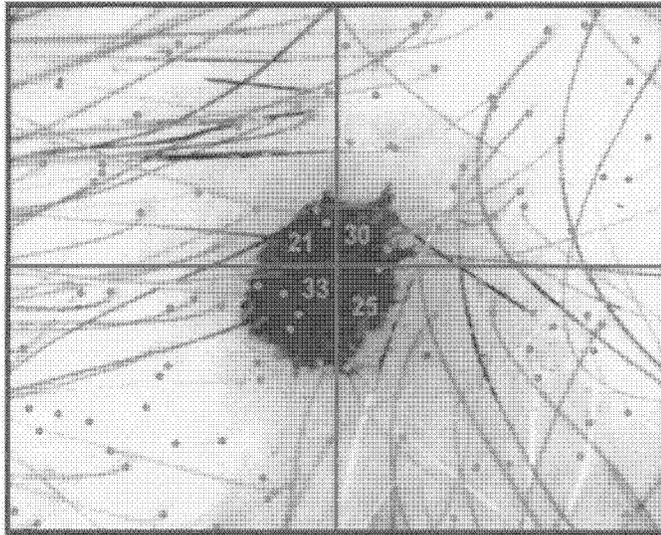
The indelible dot was checked prior to each treatment and if fading was applied over again on the fading dot. This was also used as an indicator if subject was using improper shampoos and/or conditioners.

Hair Count Procedures (For All Initial, 10-Week, 18-Week, and 26-Week Photos)

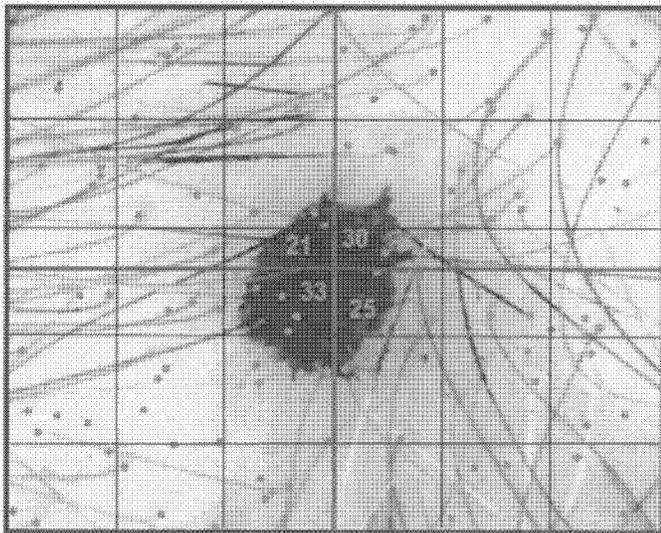
1-Raw 18 Week Hair Count Microscopic Image (.95cm x .75cm)



2-Processed 18 Week Hair Count Microscopic Image



3-Processed 18 Week Hair Count Microscopic Image With Non-Printable Grid Used For Accuracy in the Physical Counting of the hairs.



Note: All three images are the same.

Revised MEP-90 System Comparisons To Predicate Devices

The MEP-90 Hair Growth Stimulation System is as safe and effective as a combination of over 20 predicate devices that are cleared for commercial distribution in the United States, under the provisions of Title 21 U.S.C., §510(k).

It has the same intended use for treatment of the same genetic disorder as the predicate device cleared under 510(k) Number K060305. The only difference is that the MEP-90 is intended for use on females only versus K060305's use on males.

Whereas androgenic (androgenetic) alopecia is medically as the same chronic genetic disorder in both males and females, there are differences in their demonstrated symptomology between the two sexes. To insure at least equal, if not superior effectiveness as predicate device K060305, an "experimental" type of clinical effectiveness study was performed under the guidance and oversight of an Institutional Review Board (IRB) and under the direct supervision of the IRB approved licensed physician (Principal Investigator).

The MEP-90 utilizes the same visible laser wavelength (λ) as previously approved devices and has a lower measured power output than the two predicate devices provided for reference data comparison. The MEP-90 is in full compliance with design, functions, safety, and usage with 21CFR Part 1010 (Performance Standards For Radiation Emitting Devices).

The safety and effectiveness of the visible lasers' wavelength (λ) do not raise any new safety and effectiveness issues as it is classified as a "non-significant risk" (NSR) device, and satisfies and/or exceeds FDA's substantial equivalence with respect to both the intended use and technological characteristics.

Revised Specific Comparisons To Predicate Devices Chart

Predicate Device Comparative Item 510(k) Number	Midwest RF MEP-90 K091496	Predicate HairMax K060305	Predicate Quantum K032815
Device Name	MEP-90 Hair Growth Stimulation System	HairMax Lasercomb	Quantum Light Therapy System w/QS2 & QS4
Manufacturer	Midwest R.F. LLC. 1050 Walnut Ridge Dr. Hartland, WI 53029	Lexington Int'l LLC 777 Yamato Rd-S105 Boca Raton, FL 33431	Stargate Int'l, Inc. 10235 Progress Way Parker, CO 80134
Establishment Registration Number	2134565	3006182775	3004160935
Device Regulation Description	Infrared Lamp	Infrared Lamp	Infrared Lamp

Predicate Device Comparative Item	MEP-90 K091496	HairMax K060305	Quantum K032816
Device Regulation Number	21CFR; §890.5500	21CFR; §890.5500	21CFR; §890.5500
Device Regulation Identification & Classification	A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating.	A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating.	A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating.
Physical State	Light Emitting Stimulator	Light Emitting Stimulator	Light Emitting Stimulator
Product Nomenclature	Lamp, Infrared	Lamp, Infrared	Lamp, Infrared
Product Code	OAP	OAP	NHN
Device Class	Class 2	Class 2	Class 2
21CFR Part 1010 Laser Classification/Compliance	IIIa; IIIr Full Compliance	IIIa Unknown Compliance	IIIa Full Compliance
FDA Device Risk Classification	Non-Significant (NSR)	Non-Significant (NSR)	Non-Significant (NSR)
Wavelength (λ)	650nm (+≤1%) 650nm to 650.78nm Measured	650nm (±5%) 617nm to 682nm Published	628nm to 635nm (±5%) 596nm to 667nm Published
Output Power Per Diode in mw/cm ²	≤4.5mw/cm ² Measured	≤5mw/cm ² Published	≤5mw/cm ² Published
Output Energy Per Diode in J/cm ²	.03213 J/cm ² Mathematically derived	.0357 J/cm ² Mathematically derived	.0357 J/cm ² Mathematically derived
Number of Lasers	82	1 which is mirror reflected	QS2=2; QS4=4
Laser Pulse Rate	Continuous	Unknown-Proprietary	Unknown-Proprietary
Laser Pulse Duration	Continuous	Unknown-Proprietary	Unknown-Proprietary
Power	3 Volts DC; 110vAC converted to 24v DC	Unknown-Proprietary	Unknown-Proprietary Published As 1.8 watts nominal (120 volts A.C., 60 Hz).
Aiming Beam	No lens; diffused Beam Fixed Coverage	Lens but proprietary User Directed	Lens but proprietary User Directed
Laser Beam Scattering	None - Fixed angulation and required beam interruption prevent beam scattering outside of Hood assembly	User Directed	User Directed
Output Mode	Direct Light	Mirror Reflected	Direct Light

Predicate Device Comparative Item	MEP-90 K091496	HairMax K060305	Quantum K032816
Sterilization	Basic Cleaning Instructions Provided; No Sterilization Claimed, Called For Or Possible	No Sterilization Claimed, Called For In Published Materials	No Sterilization Claimed, Called For In Published Materials
Accessories	None; all items described are necessary for basic operation including mouse, keyboard, monitor, safety keys for key lock, 10' medical grade power cord, operation manual, 2 pair of laser safety glasses	Unknown besides storage case and cord	Unknown besides storage and carrying case and strap, safety keys for key lock, power cord for charging, operation manual
Materials	Injection molded and painted polycarbonate and polystyrene, Thermoformed and painted ABS, Molded and painted fiberglass. All paint is two part epoxy based	Unknown and would be proprietary information under 18U.S.C.,§1832- Assumed No Issues Due To Issuance of 510(k)	Unknown and would be proprietary information under 18U.S.C.,§1832- Assumed No Issues Due To Issuance of 510(k)
Biocompatibility	There are no materials in use on this device that are not in routine use on other devices. The biocompatibility is comparable to any of the legally marketed devices listed as follows: Midwest RF K003386 Model 1100GE-64 Midwest RF K051618 Model 1400GE-64	Assumed No Issues Due To Issuance of 510(k)	Assumed No Issues Due To Issuance of 510(k)
Indications Of Use	MEP-90 is for adjunctive use for the treatment of androgenic (androgenetic) alopecia in females and is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic (androgenetic) alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.	The LaserComb is indicated to promote hair growth in males with androgenetic alopecia who have Norwood Hamilton Classifications of IIa to V and Fitzpatrick Skin Types I to IV.	Quantum is for adjunctive relief of minor muscle and joint issues such as; arthritis, muscle spasm, rheumatism, migraine headaches, lower back pain, repetitive strain injuries, tendonitis, fibromyalgia, sprains and strains, postoperative pain, tennis and golfer's elbow, shoulder and stiffness.

Predicate Device Comparative Item	MEP-90 K091496	HairMax K060305	Quantum K032816
Indications Of Use Source	Prescription	Over The Counter	Prescription
Indications Of Use Sale and Usage Restrictions	Direction of Licensed Physician Only	Open	Direction of Licensed Physician Only
Indications Of Use Installation	Certified On Site Installer	Drop Shipped To User	Drop Shipped To User
Indications Of Use Operator and User Training/Education	Factory and/or On Site Training (User option) of approximately 6-8 hours at installation; Internet access for operational updates on MEP-90; Operation Manual; Continuing education program TBD	Operation Manual	Operation Manual
Indications Of Use Operation Control And Length of Treatment	Default Settings for recommended treatment protocol; Operator resets of time and dosage which is controlled by computer	Operator Dependent	Operator Dependent
Indications Of Use Safety In Operation	Warning labels on device; key lock with on screen warning; default treatment settings; fixed maximum power output regardless of settings; constant thru beam interrupt by patient required for laser operation; warning on screen to insure operator and patient are wearing safety glasses before lasers will operate; no beam scatter outside hood assembly; tilting of head no $\geq 3/8$ " interrupt; head proximity safety circuitry	Warning label on device then 100% Operator dependent	Warning label on device; key lock, then 100% Operator dependent

Additional Comparisons To Predicate Devices

The MEP-90 Hair Growth Stimulation System has the same intended use and/or technological characteristics as the predicate devices listed and at least an additional 15 previously FDA 510(k) approved laser devices.

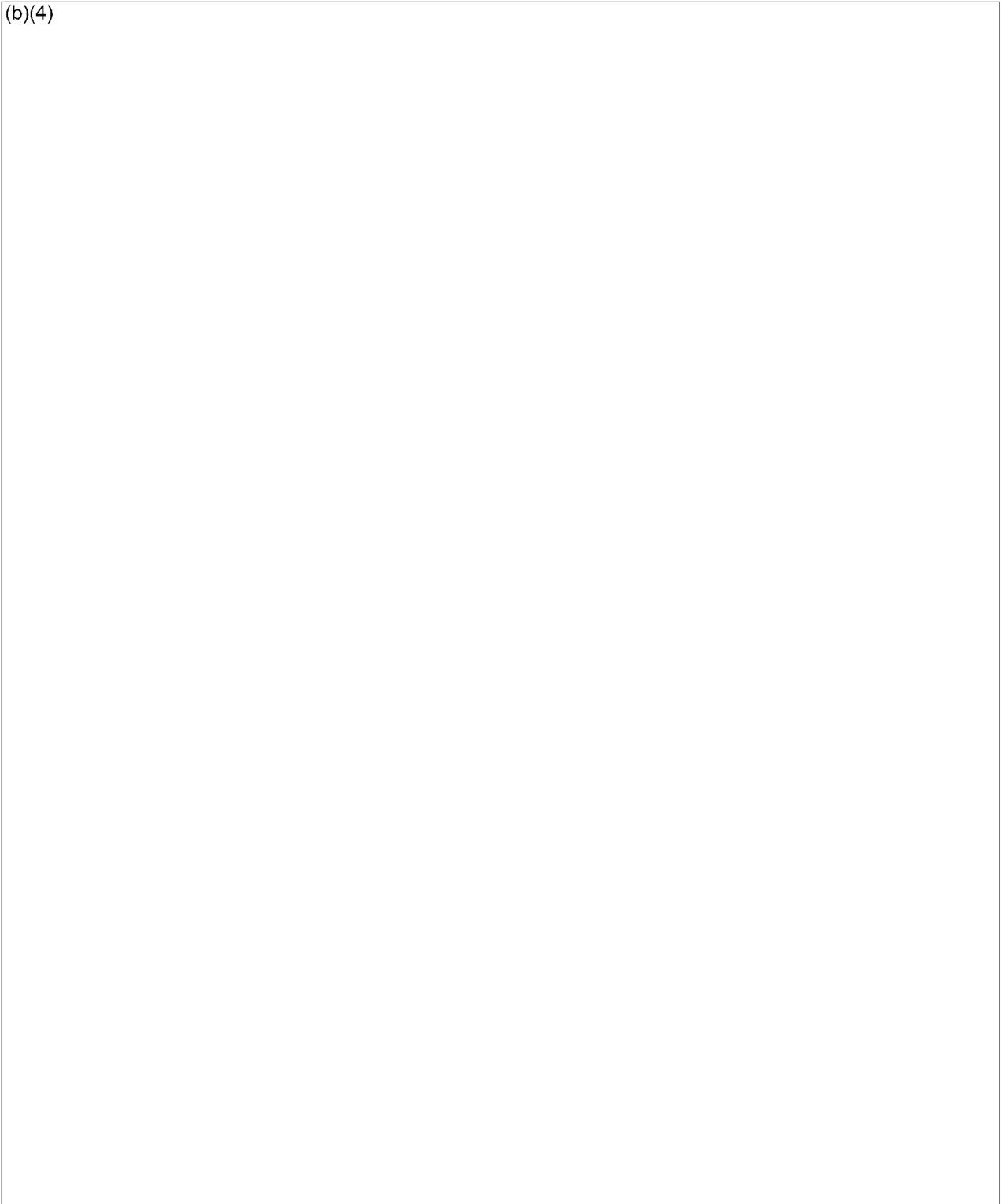
- 1- The MEP-90 System is substantially equivalent to predicate device K060305 for adjunctive use in providing treatment of androgenic (androgenetic) alopecia.

- 2- The MEP-90 System is substantially equivalent to predicate device K060305 for stimulating hair growth in patients diagnosed with androgenic (androgenetic) alopecia.
- 3- The MEP-90 System meets the clinical application criterion of predicate device K060305 in that it provides identical treatment coverage of the anatomical area called for by a current medically accepted protocol.
- 4- The MEP-90 System utilizes the same wavelength low-level laser as the predicate device K060305, i.e. 650nm ($\pm 5\%$). The acceptable range of the lasers used by the MEP-90 System is from 650nm to 650.8nm which exceeds the published tolerance of the predicate device K060305, which operates at 618nm to 683nm.
- 5- The MEP-90 System is capable of obtaining the identical clinical results as the predicate device K060305 due to its technology and design. The MEP-90 System utilizes the same laser technology as the predicate device K060305 and its clinical efficacy was confirmed based on IRB approved clinical trials performed in 2008-2009.
- 6- The current accepted protocol for treatment calls for the application of the device K060305 to be brushed through the entire scalp area in order to cover the afflicted area. This requires dependence on the patient to insure total coverage of the affected area. The MEP-90 System's total scalp area coverage design provides consistency of application and results. However, the anatomical area(s) treated are identical to the predicate device K060305.
- 7- The power output of the lasers in the MEP-90 System are identical to the predicate devices K060305 and K032816, and do not raise any safety or efficacy issues.
- 8- The different quantity of energy sources between the MEP-90 System (82) and the predicate devices; (K060305 - one) (K032816 - one, two, or four) does not raise any safety and/or efficacy issues with respect to power output regarding total surface area covered.
- 9- The different quantity of energy sources between the MEP-90 System (82) and the predicate devices; (K060305 - one) (K032816 - one, two, or four) does not raise any safety and/or efficacy issues with respect to power output regarding time.
- 10- The comparison of patient contact materials of construction for the MEP-90 System do not raise any biocompatibility issues when compared to K060305 and K032816 as no patient contact is required and the materials have been verified to be biocompatible.
- 11- The chronic genetic disorder of androgenic (androgenetic) alopecia, although considered the same between males and females, do present some differences in the symptomology between the two sexes. These differences do not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.

- 12- The clinical fact that the hair loss symptoms of men begin in an "M" shaped loss at the forehead versus the circular to linear beginning at the female crown does not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.
- 13- The comparison of males to the Norwood Hamilton hair loss scale chart versus the comparison of females to the Ludwig chart and the Savin chart does not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.
- 14- The Fitzpatrick skin typing classification is identical for both males and females therefore that does not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.
- 15- We used the term "adjunctive" due to the availability of other treatment options to the physician and to meet the criterion of evidenced based medicine (EBM)

The MEP-90 SYSTEM is substantially equivalent to the predicate devices as it has the same intended use; technological characteristics; energy delivered; materials, performance, safety, effectiveness, labeling, biocompatibility, and meets the same regulatory standards.

(b)(4)



Midwest RF, LLC
1050 Walnut Ridge Drive
Hartland, WI 53029

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Study Overview

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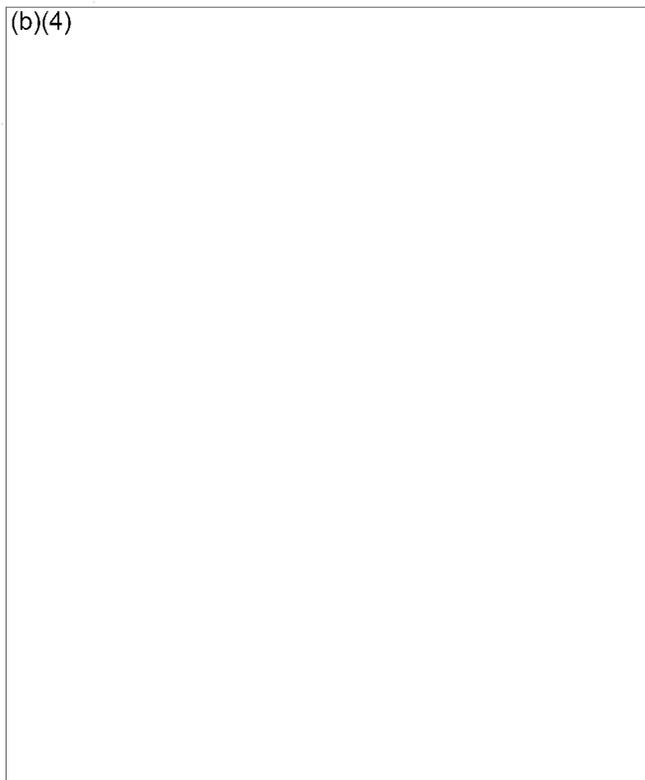


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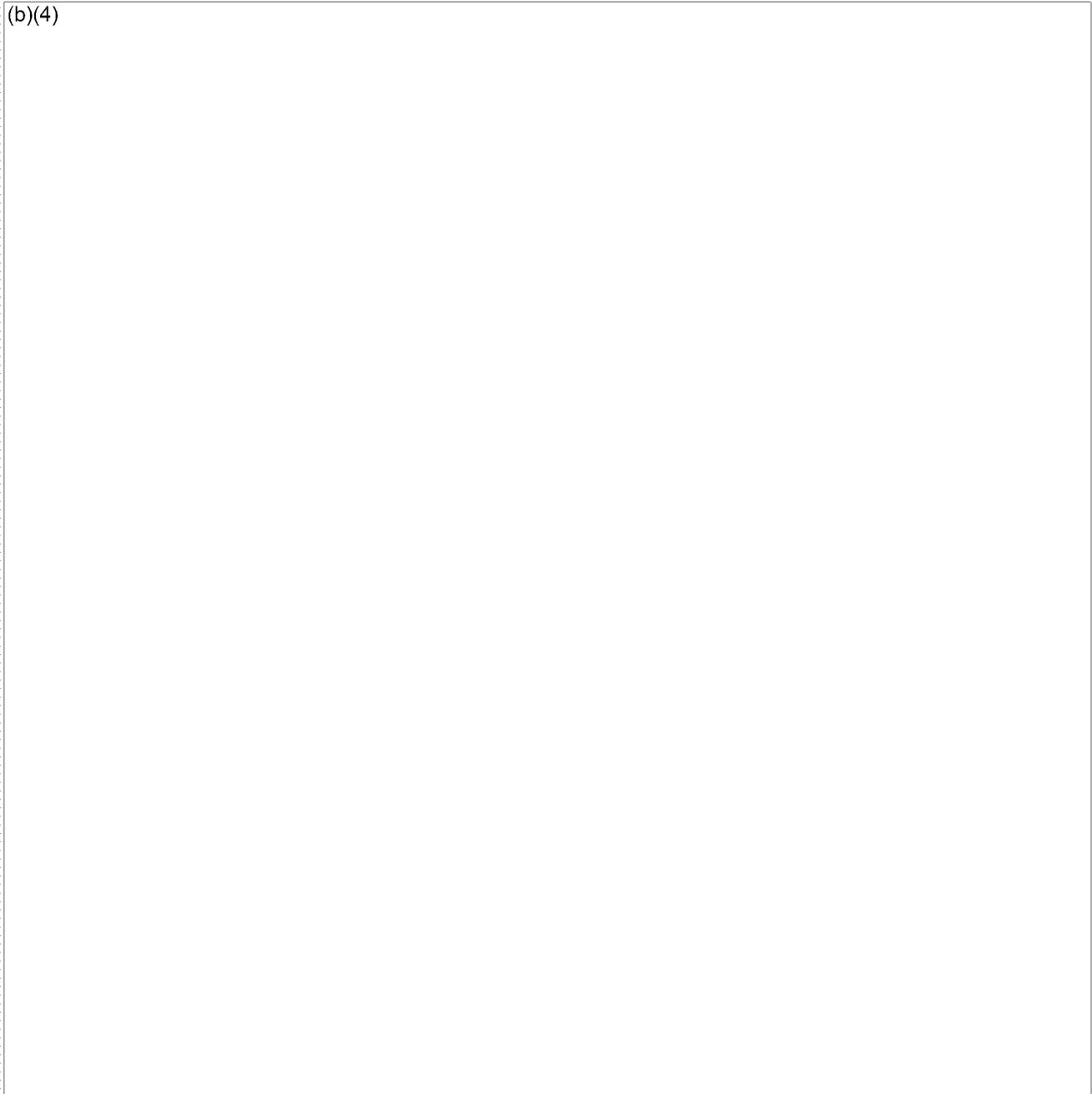
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IRB Certificate of Approval

WIRB[®]

(360) 252-2500
1-800-562-4789
FAX: (360) 252-2498

Western Institutional Review Board[®]

Western International Review Board[®]

3535 SEVENTH AVENUE, S.W. OLYMPIA, WA 98502-3010
P.O. BOX 12029, OLYMPIA, WA 98508-2029

*Certificate
of
Approval*

THE FOLLOWING WERE APPROVED:

INVESTIGATOR: Grant F. Kohler D.O.
5520-203 McNeely Drive
Raleigh, North Carolina 27612

BOARD ACTION DATE: 5/27/2008
PANEL: 5
STUDY APPROVAL EXPIRES: 5/27/2009
STUDY NUM: 1098575
WIRB PRO NUM: 20080612
INVEST NUM: 140351
WO NUM: 1-485401-1
CONTINUING REVIEW: Annually
SITE STATUS REPORTING: Annually

SPONSOR: Midwest RF, LLC
PROTOCOL NUM: MEP-90A-CDA
AMD. PRO. NUM:
TITLE:
MEP-90 Hair Growth Stimulation System Data Acquisition Study & Clinical Protocol MEP-90A-CDA

APPROVAL INCLUDES:

- Investigator
- Administrative Letter (05-01-2008)
- Administrative Letter (05-25-2008)
- Protocol
- Consent Form [50]
- Advertisement #5561151:0 Brochure Clinical Data Acquisition & Research Study - As Modified

WIRB APPROVAL IS GRANTED SUBJECT TO:

- The Board determined that the device as used in this research study is a non-significant risk device.
- The Board requires that all subjects must be able to consent for themselves to be enrolled in this study.

IF YOU HAVE ANY QUESTIONS, CONTACT WIRB AT 1-800-562-4789
This is to certify that the information contained herein is true and correct as reflected in the records of the Western Institutional Review Board (WIRB). WE CERTIFY THAT WIRB IS IN FULL COMPLIANCE WITH GOOD CLINICAL PRACTICES AS DEFINED UNDER THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) REGULATIONS AND THE INTERNATIONAL CONFERENCE ON HARMONISATION (ICH) GUIDELINES.




Theodore D. Schultz, J.D., Chairman

6/2/2008
(Date)

This document electronically reviewed and approved by Orive, Oni on 6/2/2008 1:31:52 PM PST. For more information call Client Services at 1-360-252-2500

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IRB Certificate of Approval Extension

WIRB [®] 3601 252-2500 1-800-562-4789 FAX: (360) 252-2498	Western Institutional Review Board [®] 3535 SEVENTH AVENUE, SW, OLYMPIA, WA 98502-5010 P.O. BOX 12629, OLYMPIA, WA 98508-2029	<i>Certificate of Approval</i>
THE FOLLOWING WERE APPROVED:		
INVESTIGATOR: Grant F. Koher D.O. 2203-103 Eastchester Drive High Point, North Carolina 27265		BOARD ACTION DATE: 5/5/2009 PANEL: 5 STUDY APPROVAL EXPIRES: 5/27/2010 STUDY NUM: 1098575 WIRB PRO NUM: 20080612 INVEST NUM: 140351 WO NUM: 1-548987-1 CONTINUING REVIEW: Annually SITE STATUS REPORTING: Annually
SPONSOR: Midwest RE, LLC PROTOCOL NUM: MEP-90A-CDA AMD, PRO. NUM: TITLE: MEP-90 Hair Growth Stimulation System Data Acquisition Study & Clinical Protocol MEP-90A-CDA		
APPROVAL INCLUDES: Study and Investigator for an additional continuing review period. This approval expires on the date noted above.		
WIRB APPROVAL IS GRANTED SUBJECT TO:		
IF YOU HAVE ANY QUESTIONS, CONTACT WIRB AT 1-800-562-4789 This is to certify that the information contained herein is true and correct as reflected in the records of the Western Institutional Review Board (WIRB). WE CERTIFY THAT WIRB IS IN FULL COMPLIANCE WITH GOOD CLINICAL PRACTICES AS DEFINED UNDER THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) REGULATIONS AND THE INTERNATIONAL CONFERENCE ON HARMONISATION (ICH) GUIDELINES.		
 Theodore D. Schultz, J.D., Chairman		<u>5/13/2009</u> (Date)
<small>This document electronically reviewed and approved by Taylor, Robert on 5/13/2009 5:50:45 AM PST. For more information call Client Services at 1-800-252-2500</small>		
<small>Page 1 of 2</small>		



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Research Staff Training

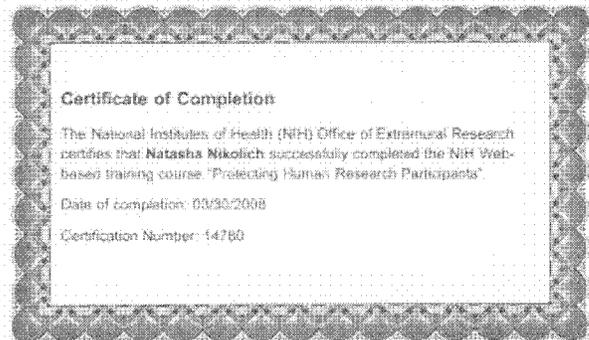
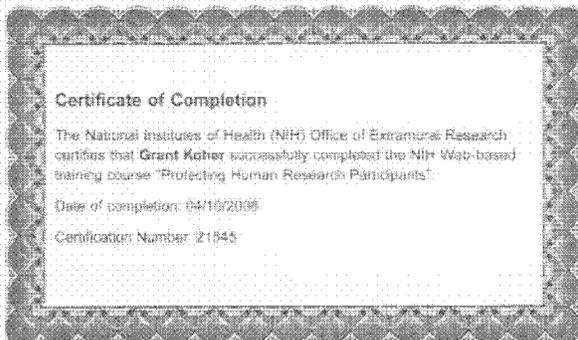
All members of the Research Team, including the Principal Investigator, were required to undergo training and be qualified in specific areas prior to their involvement of the Study.

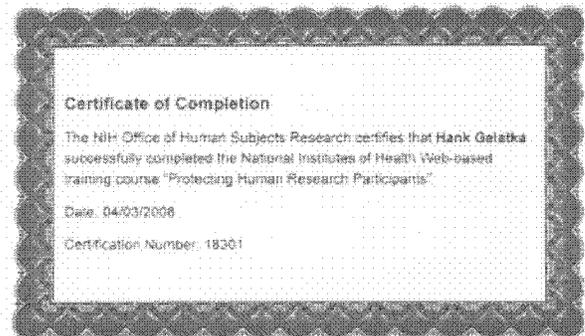
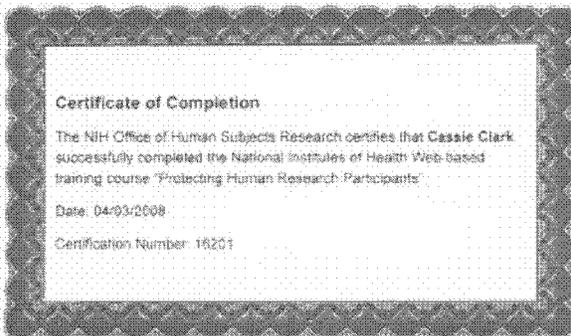
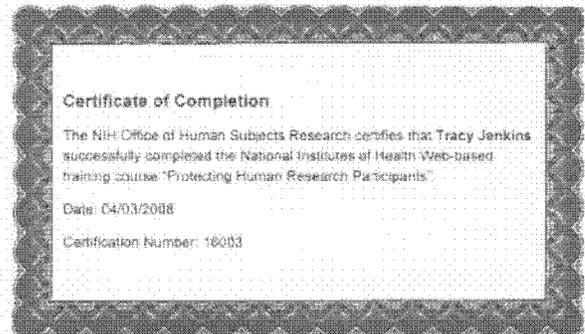
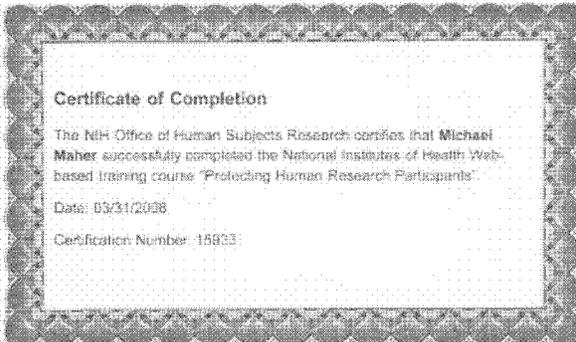
To being approved/qualified with the IRB, all staff members were required to successfully complete the following before participation:

- National Institutes of Health (NIH) Office of Extramural Research course, "Protecting Human Research Subjects."
- Provide their curriculum vitae (CV)

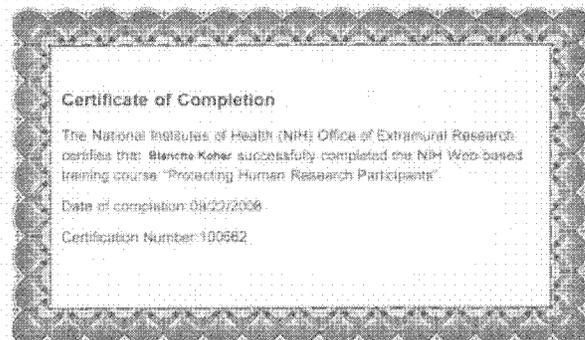
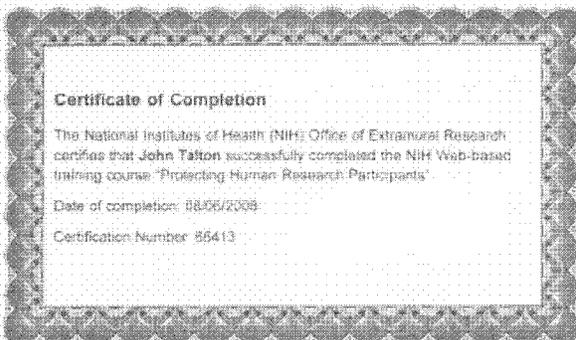
Upon receipt of IRB approval, all members of the Research Team, including the Principal Investigator, received formal training and were qualified in the following:

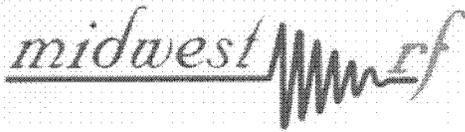
- MEP-90 System Operation
- Execution of Informed Consent Procedures
- Execution of Screening Procedures
- Application of Treatments With the MEP-90
- Photography and Documentation Procedures
- Hair Count Procedures (Principal Investigator and Research Coordinators only)





Research Staff Add-Ons:





Midwest RF, LLC • 1050 Walnut Ridge Drive • Hartland, WI 53029
(262) 367-8254 • fax (262) 367-8544

K091496/A3

November 13, 2009

K-5

Food and Drug Administration
Center For Devices and Radiological Health
Document Mail Center -W066-G609
10903 New Hampshire Avenue
Silver Spring, MD 20993-0002

FDA CDRH DMC

NOV 16 2009

Received

ATTN: LTJG Atiq Chowdhury

**Subject: Response to Your 10/30/09 Letter Referencing 510(k) Submission K091496
Request For Extension of Deadline Due to 510(k) Modifications' Request**

Dear LTJG Chowdhury:

I am in receipt of your email and attachment titled "K091496 - AI_S2.doc" of October 30th. My staff and I reviewed it along with all the correspondence between Midwest and the FDA to date. Please consider this correspondence as an initial response to your requests, with the remaining response to be submitted after our completion of the recount of 99 of the microscopic photos.

Your October 30th letter was broken down into two main sections. I am providing our responses by those designated sections:

Section 1:

1. Alternative Data Analysis

The Agency still finds serious limitations with the data you have submitted. Short of conducting an entirely new trial designed to better minimize these concerns, the following is suggested as an alternative. Please consider taking a random sample of the subjects in the trial (at least 50%). Have three individuals re-count the hair growth for these subjects in such a way that they are unaware of the previous hair counts, the other re-counters' hair counts, any patient identifiers, or the time-point of assessment (e.g. baseline, 10 week follow-up, 18 week follow-up, etc.). This could be achieved by collecting all photographs used in determining the hair count for these subjects, and de-identifying them (by assigning each subject / time-point photo some unique identifier via a system not accessible to the counters, then presenting them in some random fashion such that subject identity and time are not known or inferred by the counters.) If the revised counts for this subsample of the data were in relatively good agreement with the original counts, it would provide some assurance to rule out the possibility of an over-estimation of hair counts due to a single, un-blinded investigator. It would also provide some estimate of the variability associated with the initial hair counts.

My staff and I do have some specific issues/questions concerning one portion of this statement:

If the revised counts for this subsample of the data were in relatively good agreement with the original counts, it would provide some assurance to rule out the possibility of an over-estimation of hair counts due to a single, un-blinded investigator.

We fully understand your concerns regarding the necessity "to rule out the possibility of an over-estimation of hair counts due to a single, un-blinded investigator." We interpreted your "good agreement with the original counts" to be some form of an acceptable "standard deviation" which will be used to determine your confidence level in our statistical conclusions we have previously presented.

However, unlike other fields of medicine that have well-established parameters, e.g. obstetrics (bi-parietal diameter, femur length, abdominal circumference, start of menses) etc., there exists no precedents on hair count "standard deviations" for error.

We therefore are assuming what you are referring to is some type of validation of the "confidence interval" (CI). As you are aware this is a particular kind of interval estimate of a population parameter. In this case, we are assuming you realize it would have to be based individually on the human hairs of each subject.

As Mr. Miller is aware, one cannot provide a "confidence interval" (CI) without qualifying it with a "confidence level," which of course is expressed as a percentage of confidence in the counting (usually $\pm 5\%$).

My submission dated September 30, 2009 on pages 16 through 19 the Baseline, 10-Week, and 18-Week hair counts obtained were submitted. What makes your wording disconcerting to us is that the calculation of a "confidence interval" is estimated by the parametric process, the branch of statistics that assumes data comes from a type of probability distribution and makes inferences about the parameters of the distribution.

With androgenic alopecia, there is no "probability distribution," nor inferences about the parameters of said distribution, because no two women are identical. This is best demonstrated by comparing (b)(6) as presented on page 16 of the September 30th submission:

- (b)(6) had a Baseline Hair Count of 95 while (b)(6) was 80
- (b)(6) had an 18-Week Hair Count of 134 while (b)(6) was 113
- **Yet, both demonstrated an increase of 41% hair growth at the 18-week level**

Therefore it should be expected that there could be a high percentage of relatively minor differences in the recounts. We believe these differences may be slightly greater than $\pm 5\%$.

We ask that your statistician will accept the average deviation to be $n \geq \pm 5\%$. Of course if any recount variances were to occur affecting the overall outcome, we are asking what your criterion will be as to determine what is statistically significant.

We therefore would submit any increase to be an improvement in the Study results and any decrease would constitute a deficiency, if it lowered a subject below the 18-Week Hypothesis.

This is one of several reasons I made the statement on page 33:

(b)(4)



We fully understand the FDA's consumer protection mandate and are more than willing to provide what is necessary for you to be able to approve the MEP-90 as SE. Therefore, we offer the following as viable solutions to the issues you have presented, and more important, these solutions would meet basic statistical theorems and required criterion for a valid statistical analysis.

Part 1 – Verification Of Baseline, 10-Week, and 18-Week Hair Counts

- 1) We will contract at least three individual professionals, i.e., Registered Nurses (RN), and/or have at least a Bachelor of Science degree in Mathematics (hereafter referred to as "counters") to perform hair counts on 33 each Baseline, 33 each 10-Week, and 33 each 18-Week images each. This would represent a recount of $\geq 55\%$ of all images generated for the Study results regarding 510(k) application K091496.
- 2) None of the "counters" will have any type of professional/personal relationship or affiliation (previous, present, or future) to the manufacturer, the Study, the Principal Investigator, or to each other.

- 3) Whereas the "counters" will be presented an overview of the Study, since they have no prior knowledge of its existence, they will have no knowledge of the specifics of any of the subjects' photos they will be counting. That is they will not be aware of at what point in the Study a specific photo was taken, who the Subject was, what the results of the original count of that photo was, nor what the count(s) were obtained by the other counters.
- 4) The images will be equal parts Baseline photos (33), 10-Week photos (33), and 18-Week photos (33). The photos will be sequentially numbered for control purposes; the numbering system will start out with 3001 and progress to 3099. However, their position placement will not be sequential within the counting publication.

Example

(b)(6) Baseline photos, 10-Week photos, and 18-Week photos could be placed as follows:

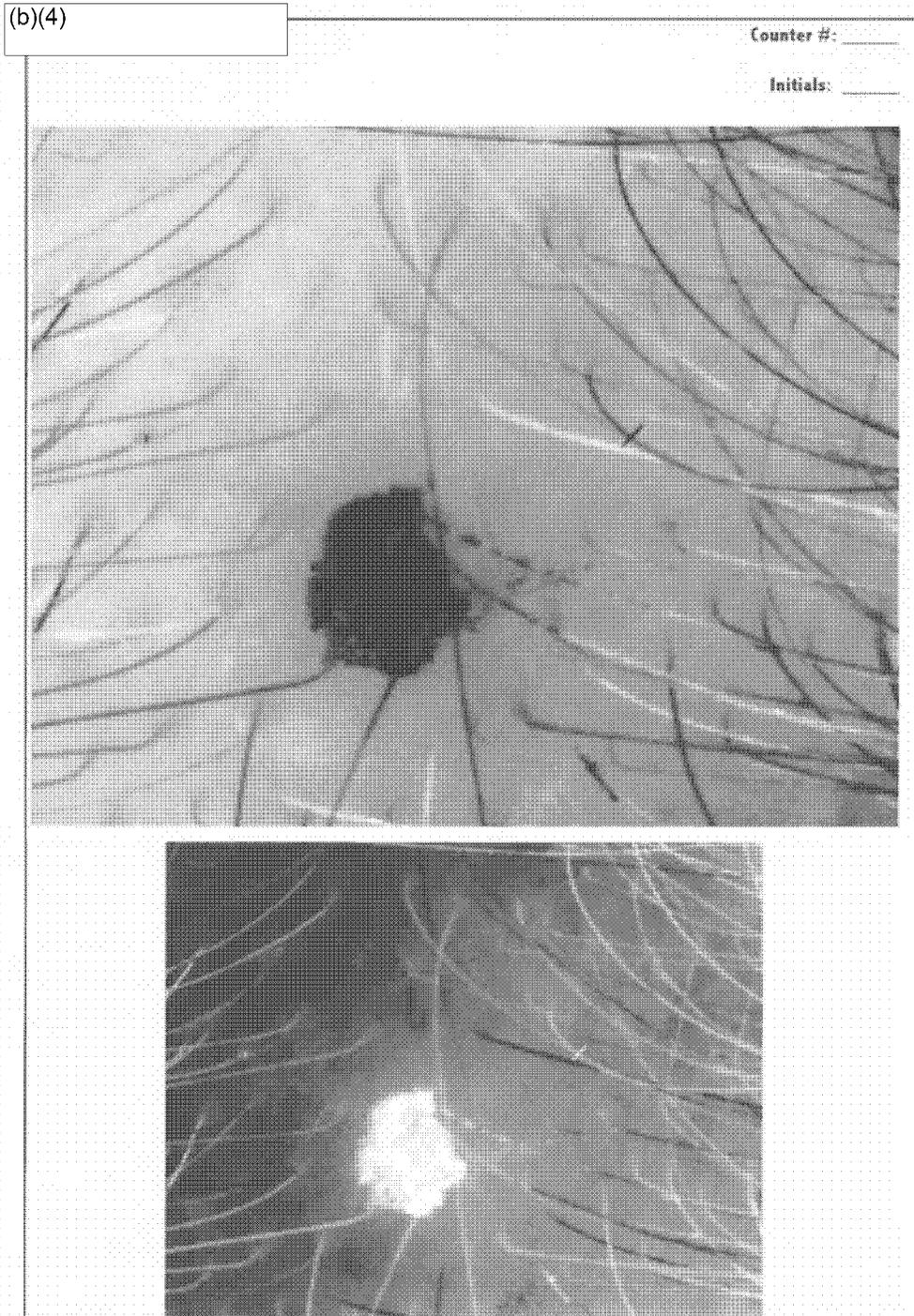
Type	Image #
Baseline:	3033
10-Week:	3011
18-Week:	3056

- 5) One roster will exist concerning all 99 microscopic photos location and be in the possession of an individual not associated with Study and/or the counters.

#	Subject Initial	10-Week	18-week	
#	ID	Photo	Photo	Photo
(b)(6)		3015	3031	3061
		3058	3047	3072
		3032	3001	3038
		3048	3073	3084
		3016	3012	3062
		3046	3049	3017
		3039	3091	3069
		3071	3002	3063
		3040	3074	3013
		3078	3030	3050
		3008	3085	3092
		3070	3041	3003
		3024	3051	3093
		3079	3075	3014
		3052	3036	3094
		3083	3095	3037
		3004	3059	3064
		3053	3086	3060
		3018	3023	3005
		3034	3076	3098
		3080	3054	3035
		3006	3099	3025
		3029	3087	3097
		3090	3055	3026
		3019	3077	3065
		3042	3066	3033
		3007	3022	3088
		3081	3056	3027
		3043	3011	3068
		3020	3096	3082
		3028	3057	3010
		3089	3044	3021
		3009	3067	3045

SS

- 6) Each Counter will work from a notebook containing 99 each 8 1/2" x 11" photo pages as demonstrated by the following:



- 7) In addition to the notations on the picture forms, each Counter will also use the following form to record their results:

(b)(4)



10-Week Validations

We will use the same contracted three individuals, to perform the 10-Week and 18-Week Hair Count validations. Like the Initial Count validations, they will not have any indication of what timeframe, Subject ID, other counters' results and/or previous results.

As previously discussed, the Counters will not have any indication of what type of photo they will be counting.

For the 10-Week Recounts, we will provide you with a spreadsheet presentation of these counts in the following *sample* format containing the results from 33 Subjects: (None of the counters will ever see/review these reports):

Subject ID#	Count Image Number	Study Initial Count	Study 10-Week Count	Study	10-WK	10-WK	10-WK	Recount	Recount	Variance
				10-WK Gain/Loss %	Recount Counter 1	Recount Counter 2	Recount Counter 3	10-WK Average Count	To 10-WK Variance	From 10-WK Count
(b)(6)	(b)(4)									

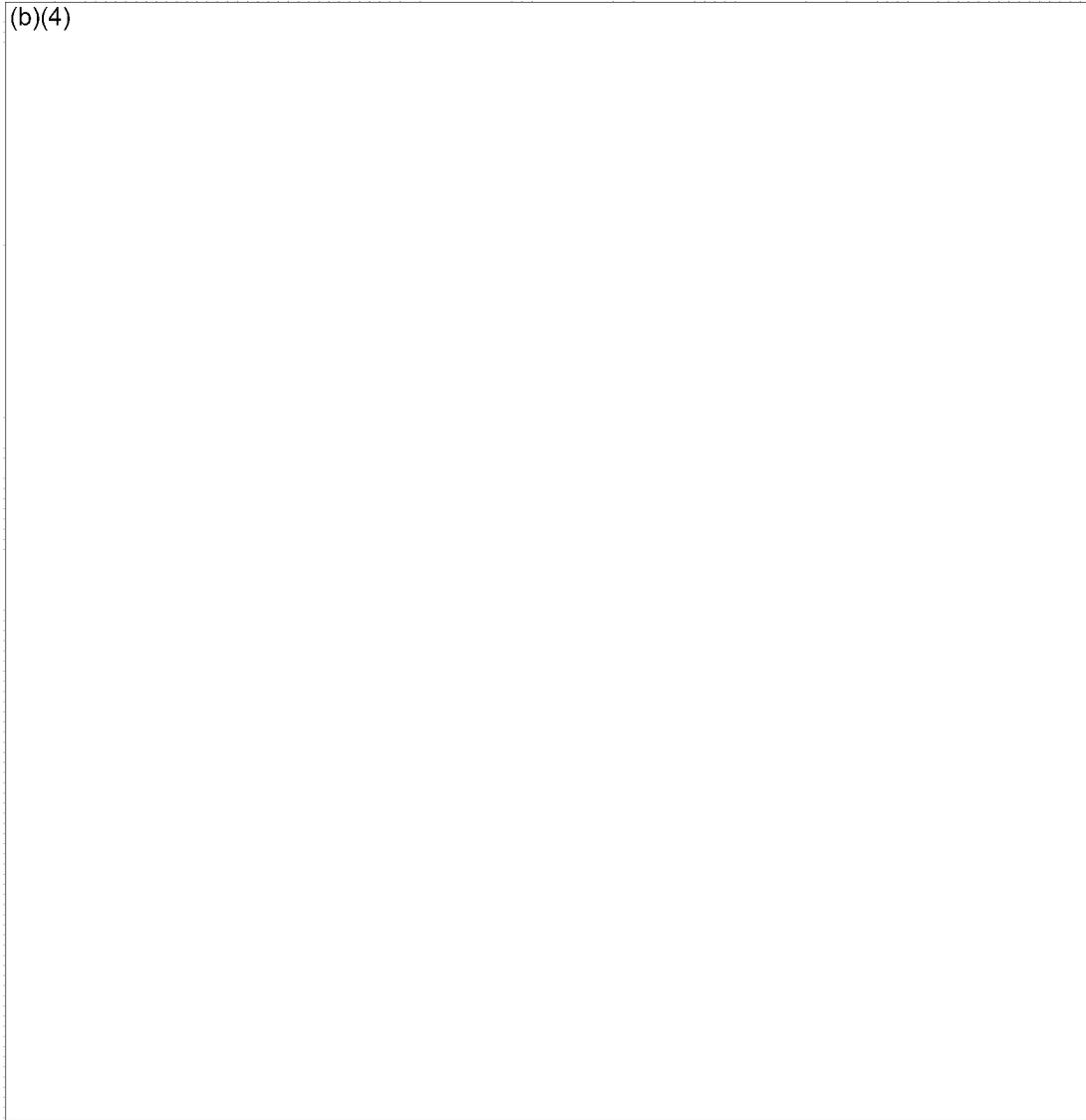
Subject ID# - Only the report provided to the FDA will have the Subject ID# indicated.

Count Image Number - Sequentially numbered for control purposes, the numbering system will start out with 3001 and progress to 3099. Their position placement will not be sequential within the counting spreadsheet, nor will any previous calculations be available to any of the counters.

Study Initial Count - The "initial count" generated and reported as part of the Study (see page 16-17 and/or page 18-19 of my September 30, 2009 submission). Only the report provided to the FDA will have the Initial Count indicated.

Study 10-Week Count - The 10-Week Count generated and reported as part of the Study (see page 16-17 of my September 30, 2009 submission). Only the report provided to the FDA will have the 10-Week Count indicated.

(b)(4)



18-Week Validations

We will use the same contracted three individuals, to perform the 10-Week and 18-Week Hair Count validations. Like the Initial Count validations, they will not have any indication of what timeframe, Subject ID, other counters' results and/or previous results.

As previously discussed, the Counters will not have any indication of what type of photo they will be counting.

For the 18-Week Recounts, we will provide you with a spreadsheet presentation of these counts in the following *sample* format containing the results from 33 Subjects: (None of the counters will ever see/review these reports):

Subject ID#	Count Image	Study Initial	Study 10-Week	Study 10-WK Gain/Loss %	10-WK Recount Counter 1	10-WK Recount Counter 2	10-WK Recount Counter 3	Recount Average	Recount To 10-WK	Variance From 10-WK
(b)(6)	(b)(4)									

Subject ID# - Only the report provided to the FDA will have the Subject ID# indicated.

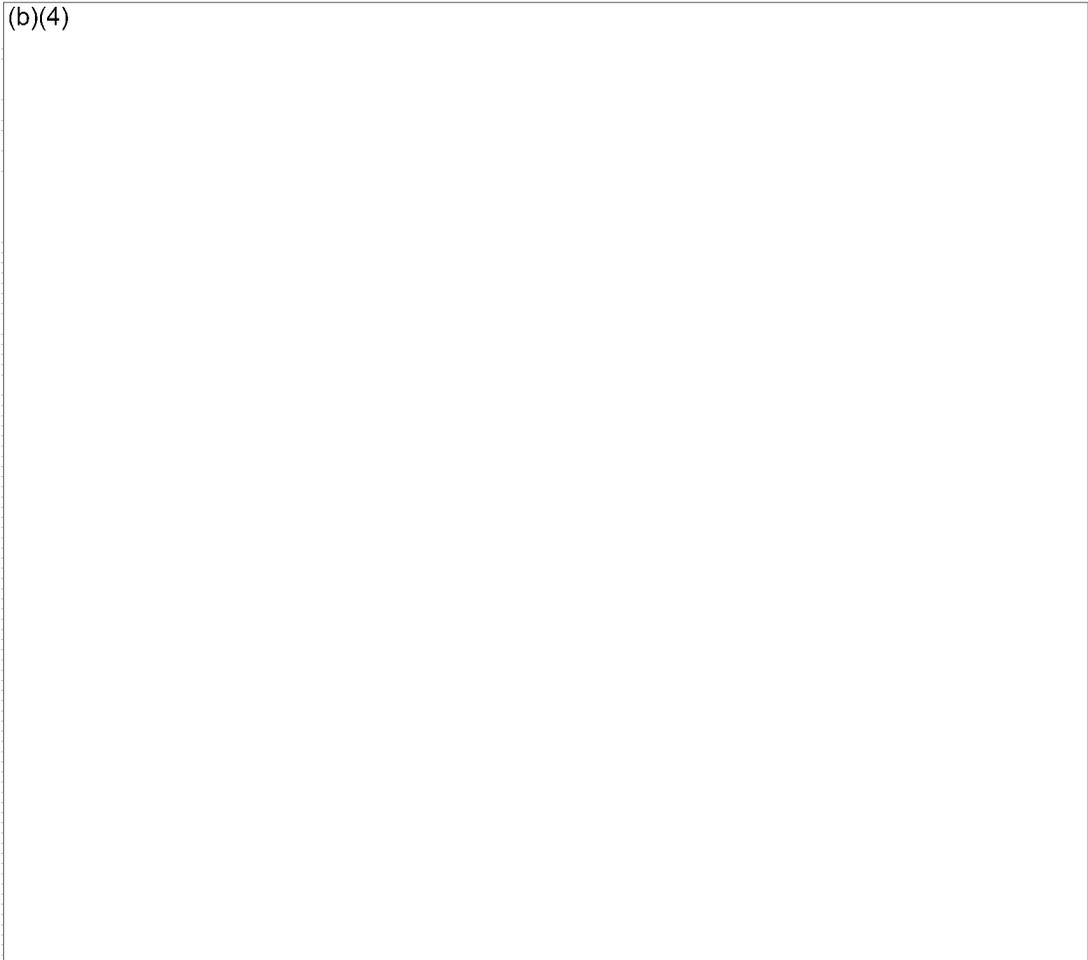
Image Number - Sequentially numbered for control purposes, the numbering system will start out with 3001 and progress to 3099. Their position placement will not be sequential within the counting spreadsheet, nor be available to any of the counters.

Study Initial Count - The "initial count" generated and reported as part of the Study (see page 18-19 of my September 30, 2009 submission). Only the report provided to the FDA will have the Initial Count indicated.

Study 18-Week Count - The 10-Week Count generated and reported as part of the Study (see page 18-19 of my September 30, 2009 submission). Only the report provided to the FDA will have the 18-Week Count indicated.

18-WK Recount Counter 1 - The obtained count by Counter #1 as generated on "Count Sheet." *See page 6 for "Count Sheet" example. The value given for the first one as designated in green is for demonstration purposes only. The values in red will be taken from the Counter's Count Sheet and/or automatically calculated.*

(b)(4)



Section 2:**2- Indications for Use—Reduce Hair Loss and Adjunctive Use Claims**

Your proposed indications for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," are not the same as predicate K060305's indications for use. Your claims for "adjunctive use for the treatment of androgenic alopecia in females" and "reduce rate of hair loss in females," are not found in predicate K060305.

- Adjunctive use for the treatment of androgenic alopecia in females:
 - You responded on Page 9, paragraph 4 that you are offended by this contradictory statement and feel that it raises concerns over the objectivity of the review. It appears that our understanding of the term "adjunctive use" is not the same as yours. The Agency uses the term "adjunctive" to mean use in combination with other therapies, where as, you appear to define the term to mean use with the availability of other treatment options. According to our definition of adjunctive to mean use with the combination of other therapies, the term adjunctive needs to be deleted from your Indications for Use since you stated that you have excluded all other therapies during your treatment.
- Reduce Rate of hair loss in females:
 - Your response on Page 9, paragraph 2 states that it is not possible to estimate a rate of hair loss. In addition, evidence of hair growth does not necessarily support prevention of hair loss since the number of hairs being counted could be the result of new hair growth minus continued hair loss. Please remove your "reduce hair loss" claim, or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

Pursuant to the previous, we wish to submit a modified "Indications For Use" for 510(k) K091496 as you prescribed:

Indications For Use: *The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:*

The treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

This change requires modification of our original 510(k) application in the following locations in our original submission:

- Revised Form FDA 3514
- Revised Indications For Use
- Revised 510(k) Summary
- Revised MEP-90 Hair Growth Stimulation System SPECIFICATIONS
- Revised MEP-90 Hair Growth Stimulation System Operation Manual

I have enclosed the pertinent changes for your reference and review:

DEPARTMENT OF HEALTH AND HUMAN SERVICES FOOD AND DRUG ADMINISTRATION			Form Approval OMB No. 9010-0120 Expiration Date: August 31, 2010. See OMB Statement on page 5.	
CDRH PREMARKET REVIEW SUBMISSION COVER SHEET				
Date of Submission May 15, 2009	User Fee Payment ID Number MD6042910-956733	FDA Submission Document Number (if known) K091496		
SECTION A TYPE OF SUBMISSION				
PMA <input type="checkbox"/> Original Submission <input type="checkbox"/> Premarket Report <input type="checkbox"/> Modular Submission <input type="checkbox"/> Amendment <input type="checkbox"/> Report <input type="checkbox"/> Report Amendment <input type="checkbox"/> Licensing Agreement	PMA & HDE Supplement <input type="checkbox"/> Regular (180 day) <input type="checkbox"/> Special <input type="checkbox"/> Panel Track (PMA Only) <input type="checkbox"/> 30-day Supplement <input type="checkbox"/> 30-day Notice <input type="checkbox"/> 135-day Supplement <input type="checkbox"/> Real-time Review <input type="checkbox"/> Amendment to PMA & HDE Supplement <input type="checkbox"/> Other	PDP <input type="checkbox"/> Original PDP <input type="checkbox"/> Notice of Completion <input type="checkbox"/> Amendment to PDP	510(k) <input checked="" type="checkbox"/> Original Submission: <input checked="" type="checkbox"/> Traditional <input type="checkbox"/> Special <input type="checkbox"/> Abbreviated (Complete section I, Page 5) <input type="checkbox"/> Additional Information <input type="checkbox"/> Third Party	Meeting <input type="checkbox"/> Pre-510(K) Meeting <input type="checkbox"/> Pre-IDE Meeting <input type="checkbox"/> Pre-PMA Meeting <input type="checkbox"/> Pre-PDP Meeting <input type="checkbox"/> Day 100 Meeting <input type="checkbox"/> Agreement Meeting <input type="checkbox"/> Determination Meeting <input type="checkbox"/> Other (specify):
IDE <input type="checkbox"/> Original Submission <input type="checkbox"/> Amendment <input type="checkbox"/> Supplement	Humanitarian Device Exemption (HDE) <input type="checkbox"/> Original Submission <input type="checkbox"/> Amendment <input type="checkbox"/> Supplement <input type="checkbox"/> Report <input type="checkbox"/> Report Amendment	Class II Exemption Petition <input type="checkbox"/> Original Submission <input type="checkbox"/> Additional Information	Evaluation of Automatic Class III Designation (De Novo) <input type="checkbox"/> Original Submission <input type="checkbox"/> Additional Information	Other Submission <input type="checkbox"/> 513(g) <input type="checkbox"/> Other (describe submission):
Have you used or cited Standards in your submission? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, please complete Section I, Page 5)				
SECTION B SUBMITTER, APPLICANT OR SPONSOR				
Company / Institution Name Midwest RF, LLC		Establishment Registration Number (if known) 2134565		
Division Name (if applicable)		Phone Number (including area code) (262) 367-8254		
Street Address 1050 Walnut Ridge Drive		FAX Number (including area code) (262) 367-8544		
City Hartland	State / Province WI	ZIP/Postal Code 53029	Country USA	
Contact Name Helmut Keidl				
Contact Title President		Contact E-mail Address helmut@midwestcomposite.com		
SECTION C APPLICATION CORRESPONDENT (e.g., consultant, if different from above)				
Company / Institution Name				
Division Name (if applicable)		Phone Number (including area code) ()		
Street Address		FAX Number (including area code) ()		
City	State / Province	ZIP/Postal Code	Country	
Contact Name				
Contact Title		Contact E-mail Address		

SECTION D1			REASON FOR APPLICATION - PMA, PDP, OR HDE		
<input type="checkbox"/> Withdrawal <input type="checkbox"/> Additional or Expanded Indications <input type="checkbox"/> Request for Extension <input type="checkbox"/> Post-approval Study Protocol <input type="checkbox"/> Request for Applicant Hold <input type="checkbox"/> Request for Removal of Applicant Hold <input type="checkbox"/> Request to Remove or Add Manufacturing Site	<input type="checkbox"/> Change in design, component, or specification: <input type="checkbox"/> Software / Hardware <input type="checkbox"/> Color Additive <input type="checkbox"/> Material <input type="checkbox"/> Specifications <input type="checkbox"/> Other (specify below)	<input type="checkbox"/> Location change: <input type="checkbox"/> Manufacturer <input type="checkbox"/> Sterilizer <input type="checkbox"/> Packager			
<input type="checkbox"/> Process change: <input type="checkbox"/> Manufacturing <input type="checkbox"/> Sterilization <input type="checkbox"/> Packaging <input type="checkbox"/> Other (specify below)	<input type="checkbox"/> Labeling change: <input type="checkbox"/> Indications <input type="checkbox"/> Instructions <input type="checkbox"/> Performance <input type="checkbox"/> Shelf Life <input type="checkbox"/> Trade Name <input type="checkbox"/> Other (specify below)	<input type="checkbox"/> Report Submission: <input type="checkbox"/> Annual or Periodic <input type="checkbox"/> Post-approval Study <input type="checkbox"/> Adverse Reaction <input type="checkbox"/> Device Defect <input type="checkbox"/> Amendment			
<input type="checkbox"/> Response to FDA correspondence:		<input type="checkbox"/> Change in Ownership <input type="checkbox"/> Change in Correspondent <input type="checkbox"/> Change of Applicant Address			
<input type="checkbox"/> Other Reason (specify):					
SECTION D2			REASON FOR APPLICATION - IDE		
<input type="checkbox"/> New Device <input type="checkbox"/> New Indication <input type="checkbox"/> Addition of Institution <input type="checkbox"/> Expansion / Extension of Study <input type="checkbox"/> IRB Certification <input type="checkbox"/> Termination of Study <input type="checkbox"/> Withdrawal of Application <input type="checkbox"/> Unanticipated Adverse Effect <input type="checkbox"/> Notification of Emergency Use <input type="checkbox"/> Compassionate Use Request <input type="checkbox"/> Treatment IDE <input type="checkbox"/> Continued Access	<input type="checkbox"/> Change in: <input type="checkbox"/> Correspondent / Applicant <input type="checkbox"/> Design / Device <input type="checkbox"/> Informed Consent <input type="checkbox"/> Manufacturer <input type="checkbox"/> Manufacturing Process <input type="checkbox"/> Protocol - Feasibility <input type="checkbox"/> Protocol - Other <input type="checkbox"/> Sponsor <input type="checkbox"/> Report submission: <input type="checkbox"/> Current Investigator <input type="checkbox"/> Annual Progress Report <input type="checkbox"/> Site Waiver Report <input type="checkbox"/> Final	<input type="checkbox"/> Repose to FDA Letter Concerning: <input type="checkbox"/> Conditional Approval <input type="checkbox"/> Deemed Approved <input type="checkbox"/> Deficient Final Report <input type="checkbox"/> Deficient Progress Report <input type="checkbox"/> Deficient Investigator Report <input type="checkbox"/> Disapproval <input type="checkbox"/> Request Extension of Time to Respond to FDA <input type="checkbox"/> Request Meeting <input type="checkbox"/> Request Hearing			
<input type="checkbox"/> Other Reason (specify):					
SECTION D3			REASON FOR SUBMISSION - 510(k)		
<input checked="" type="checkbox"/> New Device	<input type="checkbox"/> Additional or Expanded Indications	<input type="checkbox"/> Change in Technology			
<input type="checkbox"/> Other Reason (specify):					

SECTION E ADDITIONAL INFORMATION ON 510(K) SUBMISSIONS							
Product codes of devices to which substantial equivalence is claimed						Summary of, or statement concerning, safety and effectiveness information	
1	OAP	2	NHN	3		<input checked="" type="checkbox"/> 510 (k) summary attached	
5		6		7		<input type="checkbox"/> 510 (k) statement	
Information on devices to which substantial equivalence is claimed (if known)							
	510(k) Number		Trade or Proprietary or Model Name		Manufacturer		
1	K060305	1	Hairmax Lasercomb	1	Lexington International LLC		
2	K032816	2	Quantum Light Therapy System	2	Stargate International, Inc.		
3		3		3			
4		4		4			
5		5		5			
6		6		6			
SECTION F PRODUCT INFORMATION - APPLICATION TO ALL APPLICATIONS							
Common or usual name or classification Lamp - Infrared - Non Heating							
	Trade or Proprietary or Model Name for This Device				Model Number		
1	MEP-90 Hair Growth Stimulation System				1 MEP-90		
2					2		
3					3		
4					4		
5					5		
FDA document numbers of all prior related submissions (regardless of outcome)							
1	2	3	4	5	6		
7	8	9	10	11	12		
Data included in Submission <input type="checkbox"/> Laboratory Testing <input type="checkbox"/> Animal Trials <input checked="" type="checkbox"/> Human Trials							
SECTION G PRODUCT CLASSIFICATION - APPLICATION TO ALL APPLICATIONS							
Product Code OAP		C.F.R. Section (if applicable) 21CFR §890.5500			Device Class <input type="checkbox"/> Class I <input checked="" type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Unclassified		
Classification Panel Infrared Lamp							
Indications (from labeling) The treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.							

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Note: Submission of this information does not affect the need to submit a 2891 or 2891a Device Establishment Registration form.		FDA Document Number (if known)	
SECTION H MANUFACTURING / PACKAGING / STERILIZATION SITES RELATING TO A SUBMISSION			
<input checked="" type="checkbox"/> Original <input type="checkbox"/> Add <input type="checkbox"/> Delete		Facility Establishment Identifier (FEI) Number	
<input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Contract Manufacturer		<input type="checkbox"/> Contract Sterilizer <input type="checkbox"/> Repackager / Relabeler	
Company / Institution Name Midwest RF, LLC		Establishment Registration Number 2134565	
Division Name (if applicable)		Phone Number (including area code) (262) 367-8254	
Street Address 1050 Walnut Ridge Drive		FAX Number (including area code) (262) 367-8544	
City Hartland		State / Province WI	ZIP/Postal Code 53029
Country USA			
Contact Name Helmut Keidl	Contact Title President	Contact E-mail Address helmut@midwestcomposite.com	
<input type="checkbox"/> Original <input type="checkbox"/> Add <input type="checkbox"/> Delete		Facility Establishment Identifier (FEI) Number	
<input type="checkbox"/> Manufacturer <input type="checkbox"/> Contract Manufacturer		<input type="checkbox"/> Contract Sterilizer <input type="checkbox"/> Repackager / Relabeler	
Company / Institution Name		Establishment Registration Number	
Division Name (if applicable)		Phone Number (including area code) ()	
Street Address		FAX Number (including area code) ()	
City		State / Province	ZIP/Postal Code
Country			
Contact Name	Contact Title	Contact E-mail Address	
<input type="checkbox"/> Original <input type="checkbox"/> Add <input type="checkbox"/> Delete		Facility Establishment Identifier (FEI) Number	
<input type="checkbox"/> Manufacturer <input type="checkbox"/> Contract Manufacturer		<input type="checkbox"/> Contract Sterilizer <input type="checkbox"/> Repackager / Relabeler	
Company / Institution Name		Establishment Registration Number	
Division Name (if applicable)		Phone Number (including area code) ()	
Street Address		FAX Number (including area code) ()	
City		State / Province	ZIP/Postal Code
Country			
Contact Name	Contact Title	Contact E-mail Address	

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SECTION I UTILIZATION OF STANDARDS					
Note: Complete this section if your application or submission cites standards or includes a "Declaration of Conformity to a Recognized Standard" statement.					
1	Standards No.	Standards Organization	Standards Title	Version	Date
2	Standards No.	Standards Organization	Standards Title	Version	Date
3	Standards No.	Standards Organization	Standards Title	Version	Date
4	Standards No.	Standards Organization	Standards Title	Version	Date
5	Standards No.	Standards Organization	Standards Title	Version	Date
6	Standards No.	Standards Organization	Standards Title	Version	Date
7	Standards No.	Standards Organization	Standards Title	Version	Date
Please include any additional standards to be cited on a separate page.					
<p>Public reporting burden for this collection of information is estimated to average 0.5 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to:</p> <p style="text-align: center;">Food and Drug Administration CDRH (HFZ-342) 9200 Corporate Blvd. Rockville, MD 20850</p> <p><i>An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control</i></p>					

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INDICATIONS FOR USE

510(k) Number: K091496

Device Name: MEP-90 Hair Growth Stimulation System

Indications For Use: The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

The treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

Prescription Use: **AND/OR** **Over The Counter Use:**
(Part 21 CFR 801 Subpart D)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

510(k) Summary

(as required per 21CFR; §807.92)

MEP-90 Hair Growth Stimulation System

I. Applicant Midwest RF LLC
1050 Walnut Ridge Drive
Hartland, WI 53029 USA

Phone: (262) 867-8254
Fax: (262) 867-8554

II. Contact Name Helmut Keidl, President
helmut@midwestcomposite.com

III. Device Name

Proprietary Name MEP-90 Hair Growth Stimulation System
Common/Usual Name(s) Light Therapy Hair System
Classification Name Infrared Lamp per 21CFR 890.5500
Product Code(s) OAP; NHN

IV. Predicate Devices

510(k) Number	Device	Manufacturer
K060305	Hairmax Lasercomb	Lexington International LLC
K032816	Quantum Light Therapy System	Stargate International

VI. Indications For Use

The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

Medically prescribed use for the treatment of androgenic alopecia in females;

The treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

VII. Technological Characteristics

The MEP-90 is a stationary low-level laser device that promotes hair growth and provides treatment for androgenic (androgenetic) alopecia in females. The device provides automated and timed equal distribution of laser light to 100% of the scalp.

The MEP-90 operation is controlled by an operating system that affords the user maximum flexibility for individual treatments. The device applies a measured very high tolerance ($\leq \pm 7.6\%$) wavelength (λ) to the scalp stimulating hair growth by the proven concept of biostimulation.

VII. Performance Data And Clinical Efficacy

A multi-phased experimental study was performed with Institutional Review Board (IRB) pre-approval and oversight, in accordance with all applicable references of the Food and Drug Cosmetic Act and Title 21; Code of Federal Regulations.

Androgenic alopecia in women is a chronic medical condition requiring diagnosis, treatment, and monitoring by a licensed medical physician. The condition in women demonstrates both physical and emotional symptoms, which requires addressing by a licensed medical professional.

For the MEP-90 efficacy determination, each subject received a total of 36 each, 20-minute treatments with the MEP-90, over a period of 18 weeks. Results were reviewed at the 10-Week (20 treatment) and 18-Week (36 treatment) levels.

After 20 treatments (10-Weeks), 92% of the subjects demonstrated an increased hair count of $\geq 10\%$ with 57% demonstrating an increase of $\geq 30\%$. 98% of the subjects indicated a medically significant stabilization of their rate of hair loss.

After the 36th treatment, 97% of the subject population demonstrated an increased hair count of $\geq 20\%$. A total of 89% of all subjects demonstrated an increased hair count of $\geq 30\%$, with 57% demonstrating an increased hair count of $\geq 50\%$.

87% of the subjects indicated the treatments have helped their condition, with 60% reporting their loss rate has further slowed down from the 10-week period, and 65% reported their visible area of the alopecia (bald spot) had gotten smaller.

100% of the linear trend plotting for all subjects of their Initial, 10-Week, and 18-Week hair counts demonstrated a historical rate of increased hair growth.

No subject experienced any adverse event and/or effect from the treatments.

VI. Substantial Equivalency

The MEP-90 is substantially equivalent to other pulsed therapeutic light therapy systems currently in commercial distribution. The MEP-90 has the same intended use to the predicate device approved for commercial distribution under 510(k) number K060305 and technological and safety characteristics to the predicate device approved for commercial distribution under 510(k) number K032816.

It exceeds the clinically accepted therapeutic results standards of FDA 510(k) K060305 previously approved light therapy system into a system which provides a more controlled application and larger treatment coverage area at no increased risk to the patient.

The technological equivalence to the predicate devices is substantiated by the wavelength and power output generated by the MEP-90. The MEP-90 provides expanded treatment benefits and regimens for clinical presentations already approved by the Food and Drug Administration for the predicate device.

The MEP-90 is as safe and effective as a combination of the predicate devices listed and numerous others. It has the same intended use of affecting hair growth as the hair growth predicate device (K060305). In addition, the MEP-90 has the same general indications, i.e., treating androgenic alopecia, and the same specific indication of promoting hair growth as the predicate device.

The MEP-90 also has many of the same or similar technological characteristics as a combination of its predicate devices. These include multiple lasers and visible laser wavelength.

The technological differences between the MEP-90 and its predicate devices, specifically the use of red laser to treat androgenic alopecia in females, does not raise new questions of safety or effectiveness for several reasons:

First, the safety and effectiveness profile of the type, wavelength, and power output of this type of laser is well established and previously cleared by the FDA.

Second, FDA's clearance of the predicate device with a much wider wavelength tolerances than the MEP-90's, confirms the favorable risk benefit ratio of visible lasers.

Third, the clinical data acquired confirms both the safety and effectiveness of the MEP-90 for prescription use in promoting hair growth in the intended patient population, despite the difference in technological characteristics between the MEP-90 and K060305. The data demonstrates clear statistical significance of the treatment results obtained and provide mathematical certainty that the results attained did not occur by chance.

These facts exceed FDA's substantial equivalence requirements with respect to the intended use, clinical efficacy, and technological characteristics of the MEP-90.

While there are some technological differences between the MEP-90 and its predicate devices, Midwest conducted an Institutional Review Board approved and monitored clinical study, with the MEP-90, to show that the device functions as intended for its proposed indication for use without any serious side effects or risks.

The clinical and effectiveness data demonstrates that the MEP-90 is effective in promoting hair growth, does not present any safety issues, is classified by the FDA as a non-significant risk (NSR) device, therefore the FDA should approve the medical device by approval of the 510(k).

MEP-90 Hair Growth Stimulation System SPECIFICATIONS

Specifications - General

The MEP-90 Hair Growth Stimulation System is a non- heating lamp as described under the provisions of 21CFR 890.5500 and is clinically indicated for use in the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II, and, who have been determined to have a Fitzpatrick Skin Typing of I to IV.

An Alternating Current (AC) power adapter converting AC to 24 Volts DC powers the MEP-90.

The basic system configuration consists of:

- MEP-90 Hair Growth Stimulation System Console w/ PC, 19" LCD Monitor, 1ea Wireless Computer Keyboard, 1ea Wireless Computer Mouse, and 1ea 10' Medical Grade Power Cord
- 2ea MEP-90 Safety Lock Keys
- 1ea MEP-90 Operation Manual
- 2ea Operator and Patient Laser Safety Glasses
- 1ea MEP-90 Warranty Registration Card

(b)(4)

The MEP-90 System Console is equipped for wireless internet and provides the following outputs:

- 1 Ethernet connection
- 8 USB2 connections (4 Available)
- 2 Audio out connections
- 1 VGA video out connections
- 1 Audio in connections
- 1 Video in connections (NTSC)

The MEP-90 Control Unit's powers 82 each 650nm visible, diffuse beam treatment lasers and one each 875nm infrared safety LED. The 82 treatment lasers are controlled by a fixed DC signal generator.

(b)(4)

Additional, but separately functioning, applications for image processing and recordkeeping are available. All applications require factory loading as part of the final production testing and installation.

Standards

The MEP-90 meets and/or exceeds the relevant sections of the following standards:

IEC 60601-1 International Electro technical Commission, Medical Electrical Equipment, Part 1: General Requirements for Safety

UL 94 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

Federal Laser Product Performance Standard

IEC 60825-1 CORR 1 Safety of Laser Products

ISO 10993 Biocompatibility

45CFR Part 15B

Operational Specifications

The MEP-90 System has the following validated operational specifications:

(b)(4)

1.2 Laser Emission Wavelength

Laser emissions shall be at 650nm ($\leq +0.76\%$) measured

1.3 Laser Emission Power Output

Maximum emission power shall be $\leq 3\text{mw/cm}^2$ measured.

1.4 Laser Operating Voltage

3.2 VDC @ 50mA

1.5 Laser Operating Temperature Range

Lasers shall have the specified power output at the specified wavelength over the temperature range of -10 to 50 degrees C.

2. Operational and Storage Environment

2.1 Operational Environment

The MEP-90 shall operate normally in the following indoor environmental conditions:

Temperature: 50°F to 104°F (10°C to 40°C)

Humidity: 15% to 90% noncondensing

2.2 Storage Environment

The MEP-90 shall operate normally after storage in the following enclosed environmental conditions:

Temperature: -4°F to 122°F (-20°C to 50°C)

Humidity: 15% to 90% non condensing

Note: Warm up to operating temperature is required if stored at temperatures below normal operating temperatures.

3. Laser Safety

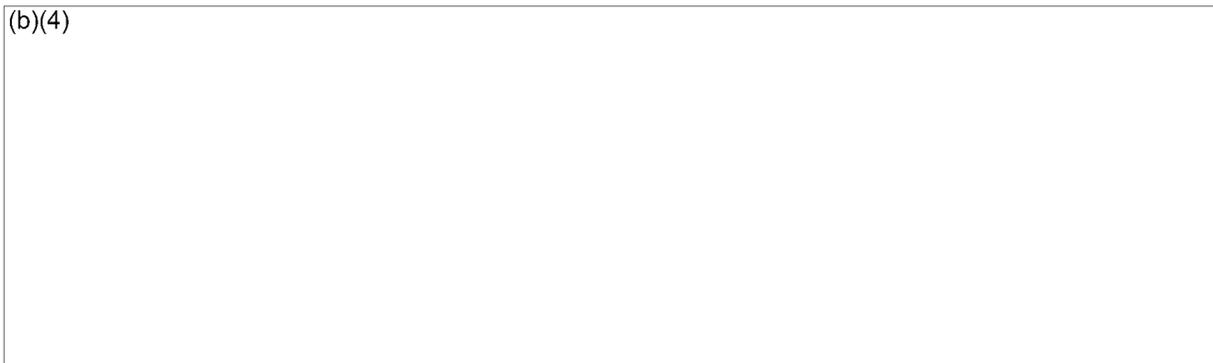
3.1 Key Switch Lock

Laser operation can only occur when a keyed switch is in the ON position. A message shall be displayed on the operator display when the key switch is in the locked position.

3.2 Patient Interlock

There is an interlock device that allows the lasers to only function when the patient's head is present in the laser dome. A message shall be displayed on the operator display when the patient interlock is locking out laser function because the patient's head is not present in the laser dome.

(b)(4)



4. Laser/Patient Interface

4.1 Distance From Patient

The laser dome is designed such that all lasers are positioned approximately 1-2 inches from the therapy area of the patient's head.

(b)(4)

4.3 Safety Glasses

Two pair of laser safe eye protective goggles shall be provided with the system. These goggles block the wavelength (l) of the following:

- OD 5+ @ 190-375 nm
- OD 2-3 @ 630-660 nm
- OD 3+ @ 660-690 nm
- OD 6+ @ 690-700 nm
- OD 6+ @ 10.600 nm

5. Patient Interface

5.1 Laser Dome

The Laser dome is large enough to accommodate a 99th percentile male head with maximum 1" space between the patient's head and the face of any laser in the dome.

The laser dome does not cover any area of the patients face.

The laser emission pattern covers the entire hair growth area of the head, not including the face and neck, of a 99 percentile male head.

The Laser pattern covers the entire therapy area at the working distance.

5.2 Patient Positioning

The Laser dome can travel from the center of the dome to the floor with a maximum range of 44" to 64."

The Laser dome travel is controlled by the operator with the operator controls.

(b)(4)

Adequate clearance exists for a chair or other seating surface to be positioned for the patient to be seated in during treatment.

(b)(4)

6. Operator Interface

(b)(4)

6.1.1 The available Operator Controlled Functions are:

- 6.1.1.1 Laser Dome up and down movement over the travel limits.
- 6.1.1.2 Treatment "Start", "Stop" and "Pause".
- 6.1.1.3 Laser dome height oscillation on and off.
- 6.1.1.4 Laser dome height oscillation distance.
- 6.1.1.5 Laser dome height oscillation dwell time.
- 6.1.1.6 Treatment time adjustment between 0 and 60 minutes.
- 6.1.1.7 Running countdown of remaining treatment time during treatment.
- 6.1.1.8 Notification when treatment has been stopped or paused.
- 6.1.1.9 Notification that treatment has started and running
- 6.1.1.10 Notification that key switch has been locked.
- 6.1.1.11 Notification that laser dome has hit an obstruction.
- 6.1.1.12 Laser on time (duty cycle) adjustment.

6.1.2 The available Operator Controllable Settings are:

- 6.1.2.1 Laser height oscillation distance default.
- 6.1.2.2 Laser dome height oscillation dwell time default.
- 6.1.2.3 Treatment time default.
- 6.1.2.4 Laser on time (duty cycle) default.

6.1.3 Software Safety Requirements

- 6.1.3.1 If obstruction safety switch is actuated, lasers will off and machine will go into pause mode if in the middle of a treatment. Laser dome “up” function will continue to function. Once the obstruction is cleared the treatment time can be resumed from where it was interrupted if the device was in the middle of a treatment.
- 6.1.3.2 When a treatment is paused using the pause function, the laser dome “up” function will continue to operate. Upon restarting of the treatment, via the “Start” function, the treatment will be resumed with the remaining time indicated when the “Pause” function was activated.

6.1.4 Hardware Controls

A power switch that activates power to the entire system including peripherals and accessories is provided. The switch meets all UL requirements.

7. Power Requirements

7.1 Input Power

Device shall operate normally with:
85VAC – 265VAC at 50/60Hz

7.2 Computer and Periphery Power

Two switched and fused outlets are provided on the device itself for powering the operational computer and another periphery device.

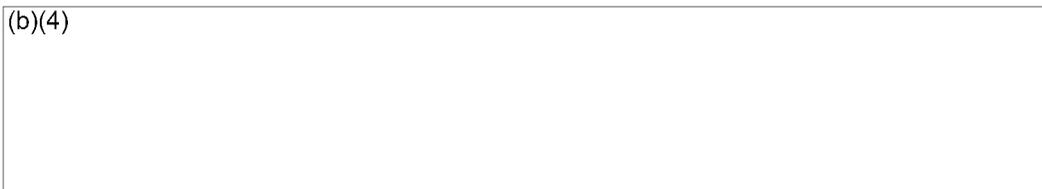
7.3 Hardware Power Requirements

24VDC @ 10 amps
12VDC @ 10 amps
3VDC @ 10 amps

8 System Enclosures

8.1 Housings

(b)(4)



8.2 System Enclosure Mobility

Casters are provided for mobility of the system enclosure. Two of the casters are lockable and swivel 360 degrees.

8.3 System Enclosure Size

System enclosure is a maximum of 30" in both length and depth so as to fit through entrance and passage doors. The height of the system enclosure allows for passage through entrance and passage doors.

8.4 System Enclosure Controls

8.4.1 Control Display

A horizontal work surface shall be provided at desk height with space to support the control display.

8.4.2 Control Keyboard

A horizontal work surface shall be provided at desk height with space to support the control keyboard.

8.4.3 Control Mouse

A horizontal work surface shall be provided at desk height with space to support the control mouse.

8.4.4 Controls Work Surface Adjustability

Operator controls work surface is adjustable in three positions as it relates to the laser dome position; 90° to the right, 90° to the left and 180° to the rear. This adjustment can be made by authorized service personnel only.

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The papilla is usually ovoid or pear shaped with the matrix wrapped completely around it, except for a short stalk-like connection to the surrounding connective tissue that provides access for the capillary. Stem cells are located at the junction of the arrector and the follicle, and are principally responsible for the ongoing hair production during the process known as the anagen stage.

The MEP-90 uses 82 lasers with diffused beams and a wavelength of 650nm each. The vast majority of manufacturers set their wavelength tolerances at $\pm 5\%$ or ± 5 nanometers. This translates to their actual wavelengths varying as much as 617nm to 683nm. However the MEP-90 utilizes measured wavelengths of 650nm to 650.8nm.

This allows maximum coverage of the scalp, thus simultaneously stimulating all of the components cells of the hairs' anatomy. We use a specific power output, with each beam measured. Our clinical research verified that 650nm, with our specific power output, is the ideal combination, because it demonstrated the maximum positive effect, complete coverage, and total safety to both the patient and the operator.

Clinical Study Overview

Midwest RF sponsored an experimental type clinical and data acquisition study between the period August 2008 and May 2009. Its objective was to determine the clinical, technological, and regulatory efficacy of therapeutic treatments using the MEP-90 Hair Growth Stimulation System, on medically diagnosed female subjects with androgenic (androgenetic) alopecia.

The Study was conducted under the direct supervision of a licensed physician, with strict adherence to all provisions of Title 21, U.S.C.; Title 21, Code of Federal Regulations; Title 45, U.S.C.; and Title 45, Code of Federal Regulations. The type, methodology, protocol, and execution of the Study were pre-approved and monitored by a federally sanctioned Institutional Review Board (IRB).

The results of the Study support the MEP-90's Indications For Use which are:

Use for the treatment of androgenic (androgenetic) alopecia in females and is indicated to promote hair growth of females with androgenetic (androgenetic) alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

We assume that the completed data requested in your October 30, 2009 letter will be the final submission necessary for 510(k) approval of K091496.

We estimate the "count validation" to carry an additional cost of approximately \$20,000 and require at least 300 man hours to insure accuracy and eliminate any potential of bias.

According to a letter received via fax from Ms. Marjorie Shulman on November 3, 2009, we would have until December 3, 2009 to provide you with your requested data. In consideration of the additional costs and time involved, we request an additional 28 days to complete the requirements.

In addition, we wish to receive your acknowledgment of the FDA's acceptability of how we intend to execute the requirements.

Please advise as soon as possible.

Thank you in advance.

Sincerely;

Midwest RF LLC



Helmut Keidl
President



Food and Drug Administration
10903 New Hampshire Avenue
Document Control Room W-066-0609
Silver Spring, MD 20993-0002

FEB 23 2010

Midwest RF, LLC
% Mr. Helmut Keidl
President
1050 Walnut Ridge Drive
Hartland, Wisconsin 53029

Re: K091496

Trade/Device Name: MEP-90 Hair Growth Stimulation System
Regulation Number: 21 CFR 890.5500
Regulation Name: Infrared lamp
Regulatory Class: Class II
Product Code: OAP
Dated: January 15, 2010
Received: January 20, 2010

Dear Mr. Keidl:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you; however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

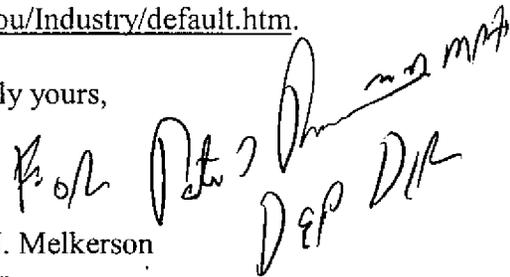
Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21

CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please go to <http://www.fda.gov/AboutFDA/CentersOffices/CDRH/CDRHOffices/ucm115809.htm> for the Center for Devices and Radiological Health's (CDRH's) Office of Compliance. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>.

Sincerely yours,

Handwritten signature of Mark N. Melkerson in black ink. The signature is stylized and includes the initials 'M.N.M.' at the end.

Mark N. Melkerson
Director
Division of Surgical, Orthopedic
And Restorative Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

INDICATIONS FOR USE

510(k) Number: K091496

Device Name: MEP-90 Hair Growth Stimulation System

Indications For Use: The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

The treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

Prescription Use: **AND/OR** **Over The Counter Use:**
(Part 21 CFR 801 Subpart D)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)



(Division Sign-Off)
Division of Surgical, Orthopedic,
and Restorative Devices

510(k) Number 12091496



U.S. Food and Drug Administration
Center for Devices and Radiological Health
Document Mail Center – WO66-G609
10903 New Hampshire Avenue
Silver Spring, MD 20993-0002

November 03, 2009

MIDWEST R.F. LLC.
1050 WALNUT RIDGE DRIVE
HARTLAND, WISCONSIN 53029
UNITED STATES
ATTN: HELMUT KEIDL

510k Number: K091496

Product: MEP-90 HAIR GROWTH STIMULATION

We are holding your above-referenced Premarket Notification (510(k)) for 30 days pending receipt of the additional information that was requested by the Office of Device Evaluation. Please remember that all correspondence concerning your submission MUST cite your 510(k) number and be sent in duplicate to the Document Mail Center at the above letterhead address. Correspondence sent to any address other than the one above will not be considered as part of your official premarket notification submission. Also, please note the new Blue Book Memorandum regarding Fax and E-mail Policy entitled, "Fax and E-Mail Communication with Industry about Premarket Files Under Review. Please refer to this guidance for information on current fax and e-mail practices at

<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm089402.htm>.

The deficiencies identified represent the issues that we believe need to be resolved before our review of your 510(k) submission can be successfully completed. In developing the deficiencies, we carefully considered the statutory criteria as defined in Section 513(i) of the Federal Food, Drug, and Cosmetic Act for determining substantial equivalence of your device. We also considered the burden that may be incurred in your attempt to respond to the deficiencies. We believe that we have considered the least burdensome approach to resolving these issues. If, however, you believe that information is being requested that is not relevant to the regulatory decision or that there is a less burdensome way to resolve the issues, you should follow the procedures outlined in the "A Suggested Approach to Resolving Least Burdensome Issues" document. It is available on our Center web page at: <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/MedicalDeviceProvisionsofFDModer nizationAct/ucm136685.htm>.

If after 30 days the additional information (AI), or a request for an extension of time, is not received, we will discontinue review of your submission and proceed to delete your file from our review system (21 CFR 807.87(l)). Please note our guidance document entitled, "Guidance for Industry and FDA Staff, FDA and Industry Actions on Premarket Notification (510(k)) Submissions: Effect on FDA Review Clock and Performance Assessment". If the submitter does submit a written request for an extension, FDA will permit the 510(k) to remain on hold for up to a maximum of 180 days from the date of the AI request. The purpose of this document is to assist agency staff and the device industry in understanding how various FDA and industry actions that may be taken on 510(k)s should affect the review clock for purposes of meeting the Medical Device User Fee and Modernization Act. You may review this document at <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm089735.htm>. Pursuant to 21 CFR 20.29, a copy of your 510(k) submission will remain in the Office of Device Evaluation. If you then wish to resubmit this 510(k) notification, a new number will be assigned and your submission will be considered a new premarket notification submission.

Please remember that the Safe Medical Devices Act of 1990 states that you may not place this device into commercial distribution until you receive a decision letter from FDA allowing you to do so.

If you have procedural questions, please contact the Division of Small Manufacturers International and Consumer Assistance (DSMICA) at (301)796-7100 or at their toll-free number (800)638-2041, or contact the 510k staff at (301)796-5640.

Sincerely yours,

Marjorie Shulman
Consumer Safety Officer
Premarket Notification Section
Office of Device Evaluation
Center for Devices and Radiological Health



U.S. Food and Drug Administration
Center for Devices and Radiological Health
Document Mail Center – WO66-G609
10903 New Hampshire Avenue
Silver Spring, MD 20993-0002

September 11, 2009

MIDWEST R.F. LLC.
1050 WALNUT RIDGE DRIVE
HARTLAND, WISCONSIN 53029
UNITED STATES
ATTN: HELMUT KEIDL

510k Number: K091496

Product: MEP-90 HAIR GROWTH STIMULATION

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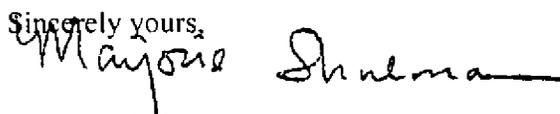
The deficiencies identified represent the issues that we believe need to be resolved before our review of your 510(k) submission can be successfully completed. In developing the deficiencies, we carefully considered the statutory criteria as defined in Section 513(i) of the Federal Food, Drug, and Cosmetic Act for determining substantial equivalence of your device. We also considered the burden that may be incurred in your attempt to respond to the deficiencies. We believe that we have considered the least burdensome approach to resolving these issues. If, however, you believe that information is being requested that is not relevant to the regulatory decision or that there is a less burdensome way to resolve the issues, you should follow the procedures outlined in the "A Suggested Approach to Resolving Least Burdensome Issues" document. It is available on our Center web page at: <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/MedicalDeviceProvisionsofFDAModernizationAct/ucm136685.htm>.

If after 30 days the additional information (AI), or a request for an extension of time, is not received, we will discontinue review of your submission and proceed to delete your file from our review system (21 CFR 807.87(l)). Please note our guidance document entitled, "Guidance for Industry and FDA Staff, FDA and Industry Actions on Premarket Notification (510(k)) Submissions: Effect on FDA Review Clock and Performance Assessment". If the submitter does submit a written request for an extension, FDA will permit the 510(k) to remain on hold for up to a maximum of 180 days from the date of the AI request. The purpose of this document is to assist agency staff and the device industry in understanding how various FDA and industry actions that may be taken on 510(k)s should affect the review clock for purposes of meeting the Medical Device User Fee and Modernization Act. You may review this document at <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm089735.htm>. Pursuant to 21 CFR 20.29, a copy of your 510(k) submission will remain in the Office of Device Evaluation. If you then wish to resubmit this 510(k) notification, a new number will be assigned and your submission will be considered a new premarket notification submission.

Please remember that the Safe Medical Devices Act of 1990 states that you may not place this device into commercial distribution until you receive a decision letter from FDA allowing you to do so.

If you have procedural questions, please contact the Division of Small Manufacturers International and Consumer Assistance (DSMICA) at (301)796-7100 or at their toll-free number (800)638-2041, or contact the 510k staff at (301)796-5640.

Sincerely yours,

A handwritten signature in black ink that reads "Marjorie Shulman". The signature is written in a cursive style with a long horizontal line extending to the right.

Marjorie Shulman
Consumer Safety Officer
Premarket Notification Section
Office of Device Evaluation
Center for Devices and Radiological Health



July 29, 2009

MIDWEST R.F. LLC.
1050 WALNUT RIDGE DRIVE
HARTLAND, WISCONSIN 53029
UNITED STATES
ATTN: HELMUT KEIDL

510k Number: K091496

Product: MEP-90 HAIR GROWTH STIMULATION

We are holding your above-referenced Premarket Notification (510(k)) for 30 days pending receipt of the additional information that was requested by the Office of Device Evaluation. Please remember that all correspondence concerning your submission MUST cite your 510(k) number and be sent in duplicate to the Document Mail Center (HFZ-401) at the above letterhead address. Correspondence sent to any address other than the one above will not be considered as part of your official premarket notification submission. Also, please note the new Blue Book Memorandum regarding Fax and E-mail Policy entitled, "Fax and E-Mail Communication with Industry about Premarket Files Under Review. Please refer to this guidance for information on current fax and e-mail practices at www.fda.gov/cdrh/ode/a02-01.html.

The deficiencies identified represent the issues that we believe need to be resolved before our review of your 510(k) submission can be successfully completed. In developing the deficiencies, we carefully considered the statutory criteria as defined in Section 513(i) of the Federal Food, Drug, and Cosmetic Act for determining substantial equivalence of your device. We also considered the burden that may be incurred in your attempt to respond to the deficiencies. We believe that we have considered the least burdensome approach to resolving these issues. If, however, you believe that information is being requested that is not relevant to the regulatory decision or that there is a less burdensome way to resolve the issues, you should follow the procedures outlined in the "A Suggested Approach to Resolving Least Burdensome Issues" document. It is available on our Center web page at: <http://www.fda.gov/cdrh/modact/leastburdensome.html>.

If after 30 days the additional information (AI), or a request for an extension of time, is not received, we will discontinue review of your submission and proceed to delete your file from our review system (21 CFR 807.87(l)). Please note our guidance document entitled, "Guidance for Industry and FDA Staff, FDA and Industry Actions on Premarket Notification (510(k)) Submissions: Effect on FDA Review Clock and Performance Assessment". If the submitter does submit a written request for an extension, FDA will permit the 510(k) to remain on hold for up to a maximum of 180 days from the date of the AI request. The purpose of this document is to assist agency staff and the device industry in understanding how various FDA and industry actions that may be taken on 510(k)s should affect the review clock for purposes of meeting the Medical Device User Fee and Modernization Act. You may review this document at <http://www.fda.gov/cdrh/mdufma/guidance/1219.html>. Pursuant to 21 CFR 20.29, a copy of your 510(k) submission will remain in the Office of Device Evaluation. If you then wish to resubmit this 510(k) notification, a new number will be assigned and your submission will be considered a new premarket notification submission.

Please remember that the Safe Medical Devices Act of 1990 states that you may not place this device into commercial distribution until you receive a decision letter from FDA allowing you to do so.

If you have procedural questions, please contact the Division of Small Manufacturers International and Consumer Assistance (DSMICA) at (240)276-3150 or at their toll-free number (800) 638-2041, or contact the 510k staff at (240)276-4040.

Sincerely yours,

Marjorie Shulman
Supervisory Consumer Safety Officer
Premarket Notification Section
Office of Device Evaluation
Center for Devices and Radiological Health

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May 21, 2009

MIDWEST R.F. LLC.
1050 WALNUT RIDGE DRIVE
HARTLAND, WISCONSIN 53029
UNITED STATES
ATTN: HELMUT KEIDL

510k Number: K091496

Received: 5/20/2009

Product: MEP-90 HAIR GROWTH STIMULATION

The Food and Drug Administration (FDA), Center for Devices and Radiological Health (CDRH), has received the Premarket Notification, (510(k)), you submitted in accordance with Section 510(k) of the Federal Food, Drug, and Cosmetic Act (Act) for the above referenced product and for the above referenced 510(k) submitter. Please note, if the 510(k) submitter is incorrect, please notify the 510(k) Staff immediately. We have assigned your submission a unique 510(k) number that is cited above. Please refer prominently to this 510(k) number in all future correspondence that relates to this submission. We will notify you when the processing of your 510(k) has been completed or if any additional information is required. **YOU MAY NOT PLACE THIS DEVICE INTO COMMERCIAL DISTRIBUTION UNTIL YOU RECEIVE A LETTER FROM FDA ALLOWING YOU TO DO SO.**

Please remember that all correspondence concerning your submission **MUST** be sent to the Document Mail Center (DMC)(HFZ-401) at the above letterhead address. Correspondence sent to any address other than the one above will not be considered as part of your official 510(k) submission.

On September 27, 2007, the President signed an act reauthorizing medical device user fees for fiscal years 2008 - 2012. The legislation - the Medical Device User Fee Amendments of 2007 is part of a larger bill, the Food and Drug Amendments Act of 2007. Please visit our website at <http://www.fda.gov/cdrh/mdufma/index.html> for more information regarding fees and FDA review goals. In addition, effective January 2, 2008, any firm that chooses to use a standard in the review of ANY new 510(k) needs to fill out the new standards form (Form 3654) and submit it with their 510(k). The form may be found at <http://www.fda.gov/opacom/morechoices/fdaforms/FDA-3654.pdf>.

We remind you that Title VIII of the Food and Drug Administration Amendments Act of 2007 (FDAAA) amended the PHS Act by adding new section 402(j) (42 U.S.C. § 282(j)), which expanded the current database known as ClinicalTrials.gov to include mandatory registration and reporting of results for applicable clinical trials of human drugs (including biological products) and devices. Section 402(j) requires that a certification form (<http://www.fda.gov/opacom/morechoices/fdaforms/FDA-3674.pdf>) accompany 510(k)/HDE/PMA submissions. The agency has issued a draft guidance titled: "Certifications To Accompany Drug, Biological

Product, and Device Applications/Submissions: Compliance with Section 402(j) of The Public Health Service Act, Added By Title VIII of The Food and Drug Administration Amendments Act of 2007"

(http://www.fda.gov/oc/initiatives/fdaaa/guidance_certifications.html). According to the draft guidance, 510(k) submissions that do not contain clinical data do not need the certification form.

Please note the following documents as they relate to 510(k) review: 1) Guidance for Industry and FDA Staff entitled, "Interactive Review for Medical Device Submissions: 510(k)s, Original PMAs, PMA Supplements, Original BLAs and BLA Supplements". This guidance can be found at <http://www.fda.gov/cdrh/ode/guidance/1655.pdf>. Please refer to this guidance for information on a formalized interactive review process. 2) Guidance for Industry and FDA Staff entitled, "Format for Traditional and Abbreviated 510(k)s". This guidance can be found at www.fda.gov/cdrh/ode/guidance/1567.html. Please refer to this guidance for assistance on how to format an original submission for a Traditional or Abbreviated 510(k).

In all future premarket submissions, we encourage you to provide an electronic copy of your submission. By doing so, you will save FDA resources and may help reviewers navigate through longer documents more easily. Under CDRH's e-Copy Program, you may replace one paper copy of any premarket submission (e.g., 510(k), IDE, PMA, HDE) with an electronic copy. For more information about the program, including the formatting requirements, please visit our web site at www.fda.gov/cdrh/electsub.html. In addition, the 510(k) Program Video is now available for viewing on line at www.fda.gov/cdrh/video/510k.wmv.

Lastly, you should be familiar with the regulatory requirements for medical devices available at Device Advice www.fda.gov/cdrh/devadvice/". If you have questions on the status of your submission, please contact DSMICA at (240) 276-3150 or the toll-free number (800) 638-2041, or at their Internet address <http://www.fda.gov/cdrh/dsma/dsmastaf.html>. If you have procedural questions, please contact the 510(k) Staff at (240)276-4040.

Sincerely yours,

Marjorie Shulman
Supervisory Consumer Safety Officer
Premarket Notification Section
Office of Device Evaluation
Center for Devices and Radiological Health

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Midwest RF, LLC • 1050 Walnut Ridge Drive • Hartland, WI 53029
(262) 367-8254 • fax (262) 367-8544

K091496

May 15, 2009

Food and Drug Administration
Center For Devices and Radiological Health
Document Mail Center (HFZ-401)
9200 Corporate Boulevard
Rockville, MD 20850

Subject: 510(k) Notification For MEP-90 Hair Growth Stimulation System

Dear Sir/Madam:

Midwest RF, LLC intends to market the above referenced light therapy system. Attached for your review and approval is our 510(k) Premarket Notification.

The complete Table of Contents for our submission is located on the following page (p. 2).

Sincerely;

Midwest RF, LLC

K8


Helmut Keidl
President

FDA CDRH DMC

MAY 20 2009

Received

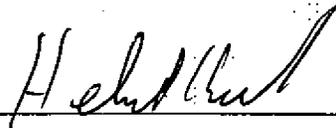
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Truthful And Accuracy Statement

I certify that, in my capacity as President of Midwest RF, LLC., I believe to the best of my knowledge, that all data and information submitted in this pre-market notification are truthful and accurate and that no material fact has been omitted.



Signature

Helmut Keidl
President

5/15/09

Date

Premarket Notification Number

DEPARTMENT OF HEALTH AND HUMAN SERVICES FOOD AND DRUG ADMINISTRATION MEDICAL DEVICE USER FEE COVER SHEET		PAYMENT IDENTIFICATION NUMBER: MD6042910-956733 Write the Payment Identification number on your check.	
A completed cover sheet must accompany each original application or supplement subject to fees. If payment is sent by U.S. mail or courier, please include a copy of this completed form with payment. Payment and mailing instructions can be found at: http://www.fda.gov/oc/mdufma/cover sheet.html			
1. COMPANY NAME AND ADDRESS (include name, street address, city state, country, and post office code) MIDWEST RF LLC 1050 Walnut Ridge Drive Hartland WI 53029 US 1.1 EMPLOYER IDENTIFICATION NUMBER (EIN) 391977041		2. CONTACT NAME Roberta Keidl 2.1 E-MAIL ADDRESS bobbie@midwestcomposite.com 2.2 TELEPHONE NUMBER (include Area code) 262-367-8254 2.3 FACSIMILE (FAX) NUMBER (Include Area code) 262-367-8544	
3. TYPE OF PREMARKET APPLICATION (Select one of the following in each column; if you are unsure, please refer to the application descriptions at the following web site: http://www.fda.gov/oc/mdufma)			
Select an application type: <input checked="" type="checkbox"/> Premarket notification(510(k)); except for third party <input type="checkbox"/> 513(g) Request for Information <input type="checkbox"/> Biologics License Application (BLA) <input type="checkbox"/> Premarket Approval Application (PMA) <input type="checkbox"/> Modular PMA <input type="checkbox"/> Product Development Protocol (PDP) <input type="checkbox"/> Premarket Report (PMR) <input type="checkbox"/> Annual Fee for Periodic Reporting (APR) <input type="checkbox"/> 30-Day Notice		3.1 Select a center <input checked="" type="checkbox"/> CDRH <input type="checkbox"/> CBER 3.2 Select one of the types below <input checked="" type="checkbox"/> Original Application Supplement Types: <input type="checkbox"/> Efficacy (BLA) <input type="checkbox"/> Panel Track (PMA, PMR, PDP) <input type="checkbox"/> Real-Time (PMA, PMR, PDP) <input type="checkbox"/> 180-day (PMA, PMR, PDP)	
4. ARE YOU A SMALL BUSINESS? (See the instructions for more information on determining this status) <input type="checkbox"/> YES, I meet the small business criteria and have submitted the required qualifying documents to FDA <input checked="" type="checkbox"/> NO, I am not a small business 4.1 If Yes, please enter your Small Business Decision Number:			
5. FDA WILL NOT ACCEPT YOUR SUBMISSION IF YOUR COMPANY HAS NOT PAID AN ESTABLISHMENT REGISTRATION FEE THAT IS DUE TO FDA. HAS YOUR COMPANY PAID ALL ESTABLISHMENT REGISTRATION FEES THAT ARE DUE TO FDA? <input checked="" type="checkbox"/> YES (All of our establishments have registered and paid the fee, or this is our first device, and we will register and pay the fee within 30 days of FDA's approval/clearance of this device.) <input type="checkbox"/> NO (If "NO," FDA will not accept your submission until you have paid all fees due to FDA. This submission will not be processed; see http://www.fda.gov/cdrh/mdufma for additional information)			
6. IS THIS PREMARKET APPLICATION COVERED BY ANY OF THE FOLLOWING USER FEE EXCEPTIONS? IF SO, CHECK THE APPLICABLE EXCEPTION.			
<input type="checkbox"/> This application is the first PMA submitted by a qualified small business, including any affiliates <input type="checkbox"/> This biologics application is submitted under section 351 of the Public Health Service Act for a product licensed for further manufacturing use only		<input type="checkbox"/> The sole purpose of the application is to support conditions of use for a pediatric population <input type="checkbox"/> The application is submitted by a state or federal government entity for a device that is not to be distributed commercially	
7. IS THIS A SUPPLEMENT TO A PREMARKET APPLICATION FOR WHICH FEES WERE WAIVED DUE TO SOLE USE IN A PEDIATRIC POPULATION THAT NOW PROPOSES CONDITION OF USE FOR ANY ADULT POPULATION? (If so, the application is subject to the fee that applies for an original premarket approval application (PMA). <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
8. USER FEE PAYMENT AMOUNT SUBMITTED FOR THIS PREMARKET APPLICATION \$3,693.00			

12-May-2009

SECTION D1			REASON FOR APPLICATION - PMA, PDP, OR HDE
<input type="checkbox"/> Withdrawal <input type="checkbox"/> Additional or Expanded Indications <input type="checkbox"/> Request for Extension <input type="checkbox"/> Post-approval Study Protocol <input type="checkbox"/> Request for Applicant Hold <input type="checkbox"/> Request for Removal of Applicant Hold <input type="checkbox"/> Request to Remove or Add Manufacturing Site	<input type="checkbox"/> Change in design, component, or specification: <input type="checkbox"/> Software / Hardware <input type="checkbox"/> Color Additive <input type="checkbox"/> Material <input type="checkbox"/> Specifications <input type="checkbox"/> Other (specify below)	<input type="checkbox"/> Location change: <input type="checkbox"/> Manufacturer <input type="checkbox"/> Sterilizer <input type="checkbox"/> Packager	
<input type="checkbox"/> Process change: <input type="checkbox"/> Manufacturing <input type="checkbox"/> Sterilization <input type="checkbox"/> Packaging <input type="checkbox"/> Other (specify below)	<input type="checkbox"/> Labeling change: <input type="checkbox"/> Indications <input type="checkbox"/> Instructions <input type="checkbox"/> Performance <input type="checkbox"/> Shelf Life <input type="checkbox"/> Trade Name <input type="checkbox"/> Other (specify below)	<input type="checkbox"/> Report Submission: <input type="checkbox"/> Annual or Periodic <input type="checkbox"/> Post-approval Study <input type="checkbox"/> Adverse Reaction <input type="checkbox"/> Device Defect <input type="checkbox"/> Amendment	
<input type="checkbox"/> Response to FDA correspondence:		<input type="checkbox"/> Change in Ownership <input type="checkbox"/> Change in Correspondent <input type="checkbox"/> Change of Applicant Address	
<input type="checkbox"/> Other Reason (specify):			

SECTION D2			REASON FOR APPLICATION - IDE
<input type="checkbox"/> New Device <input type="checkbox"/> New Indication <input type="checkbox"/> Addition of Institution <input type="checkbox"/> Expansion / Extension of Study <input type="checkbox"/> IRB Certification <input type="checkbox"/> Termination of Study <input type="checkbox"/> Withdrawal of Application <input type="checkbox"/> Unanticipated Adverse Effect <input type="checkbox"/> Notification of Emergency Use <input type="checkbox"/> Compassionate Use Request <input type="checkbox"/> Treatment IDE <input type="checkbox"/> Continued Access	<input type="checkbox"/> Change in: <input type="checkbox"/> Correspondent / Applicant <input type="checkbox"/> Design / Device <input type="checkbox"/> Informed Consent <input type="checkbox"/> Manufacturer <input type="checkbox"/> Manufacturing Process <input type="checkbox"/> Protocol - Feasibility <input type="checkbox"/> Protocol - Other <input type="checkbox"/> Sponsor <input type="checkbox"/> Report submission: <input type="checkbox"/> Current Investigator <input type="checkbox"/> Annual Progress Report <input type="checkbox"/> Site Waiver Report <input type="checkbox"/> Final	<input type="checkbox"/> Reponse to FDA Letter Concerning: <input type="checkbox"/> Conditional Approval <input type="checkbox"/> Deemed Approved <input type="checkbox"/> Deficient Final Report <input type="checkbox"/> Deficient Progress Report <input type="checkbox"/> Deficient Investigator Report <input type="checkbox"/> Disapproval <input type="checkbox"/> Request Extension of Time to Respond to FDA <input type="checkbox"/> Request Meeting <input type="checkbox"/> Request Hearing	
<input type="checkbox"/> Other Reason (specify):			

SECTION D3			REASON FOR SUBMISSION - 510(k)
<input checked="" type="checkbox"/> New Device	<input type="checkbox"/> Additional or Expanded Indications	<input type="checkbox"/> Change in Technology	
<input type="checkbox"/> Other Reason (specify):			

SECTION E ADDITIONAL INFORMATION ON 510(K) SUBMISSIONS

Product codes of devices to which substantial equivalence is claimed				Summary of, or statement concerning, safety and effectiveness information <input checked="" type="checkbox"/> 510 (k) summary attached <input type="checkbox"/> 510 (k) statement
1	OAP	2	NHN	
3		4		
5		6		
7		8		

Information on devices to which substantial equivalence is claimed (if known)

	510(k) Number	Trade or Proprietary or Model Name	Manufacturer
1	K060305	Hairmax Lasercomb	Lexington International LLC
2	K032816	Quantum Light Therapy System	Stargate International, Inc.
3			
4			
5			
6			

SECTION F PRODUCT INFORMATION - APPLICATION TO ALL APPLICATIONS

Common or usual name or classification
Lamp - Infrared - Non Heating

	Trade or Proprietary or Model Name for This Device	Model Number
1	MEP-90 Hair Growth Stimulation System	MEP-90
2		
3		
4		
5		

FDA document numbers of all prior related submissions (regardless of outcome)

1	2	3	4	5	6
7	8	9	10	11	12

Data Included in Submission
 Laboratory Testing Animal Trials Human Trials

SECTION G PRODUCT CLASSIFICATION - APPLICATION TO ALL APPLICATIONS

Product Code OAP & NHN	C.F.R. Section (if applicable) 21CFR §890.5500	Device Class <input type="checkbox"/> Class I <input checked="" type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Unclassified
Classification Panel Infrared Lamp		

Indications (from labeling)
Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

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Note: Submission of this information does not affect the need to submit a 2891 or 2891a Device Establishment Registration form. FDA Document Number (if known)

SECTION H MANUFACTURING / PACKAGING / STERILIZATION SITES RELATING TO A SUBMISSION

<input checked="" type="checkbox"/> Original <input type="checkbox"/> Add <input type="checkbox"/> Delete		Facility Establishment Identifier (FEI) Number		<input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Contract Sterilizer <input type="checkbox"/> Contract Manufacturer <input type="checkbox"/> Repackager / Relabeler	
Company / Institution Name Midwest RF, LLC			Establishment Registration Number 2134565		
Division Name (if applicable)			Phone Number (including area code) (262) 367-8254		
Street Address 1050 Walnut Ridge Drive			FAX Number (including area code) (262) 367-8544		
City Hartland		State / Province WI	ZIP/Postal Code 53029	Country USA	
Contact Name Helmut Keidl		Contact Title President		Contact E-mail Address helmut@midwestcomposite.com	

<input type="checkbox"/> Original <input type="checkbox"/> Add <input type="checkbox"/> Delete		Facility Establishment Identifier (FEI) Number		<input type="checkbox"/> Manufacturer <input type="checkbox"/> Contract Sterilizer <input type="checkbox"/> Contract Manufacturer <input type="checkbox"/> Repackager / Relabeler	
Company / Institution Name			Establishment Registration Number		
Division Name (if applicable)			Phone Number (including area code) ()		
Street Address			FAX Number (including area code) ()		
City		State / Province	ZIP/Postal Code	Country	
Contact Name		Contact Title		Contact E-mail Address	

<input type="checkbox"/> Original <input type="checkbox"/> Add <input type="checkbox"/> Delete		Facility Establishment Identifier (FEI) Number		<input type="checkbox"/> Manufacturer <input type="checkbox"/> Contract Sterilizer <input type="checkbox"/> Contract Manufacturer <input type="checkbox"/> Repackager / Relabeler	
Company / Institution Name			Establishment Registration Number		
Division Name (if applicable)			Phone Number (including area code) ()		
Street Address			FAX Number (including area code) ()		
City		State / Province	ZIP/Postal Code	Country	
Contact Name		Contact Title		Contact E-mail Address	

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SECTION I UTILIZATION OF STANDARDS

Note: Complete this section if your application or submission cites standards or includes a "Declaration of Conformity to a Recognized Standard" statement.

	Standards No.	Standards Organization	Standards Title	Version	Date
1					
2					
3					
4					
5					
6					
7					

Please include any additional standards to be cited on a separate page.

Public reporting burden for this collection of information is estimated to average 0.5 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to:

Food and Drug Administration
CDRH (HFZ-342)
9200 Corporate Blvd.
Rockville, MD 20850

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control

420

INDICATIONS FOR USE

510(k) Number:

Device Name: MEP-90 Hair Growth Stimulation System

Indications For Use: The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

Prescription Use: **AND/OR** **Over The Counter Use:**
(Part 21 CFR 801 Subpart D)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

510(k) Summary

(as required per 21CFR; §807.92)

MEP-90 Hair Growth Stimulation System

I. Applicant Midwest RF LLC
1050 Walnut Ridge Drive
Hartland, WI 53029 USA

Phone: (262) 867-8254
Fax: (262) 867-8554

II. Contact Name Helmut Keidl, President
helmut@midwestcomposite.com

III. Device Name

Proprietary Name MEP-90 Hair Growth Stimulation System
Common/Usual Name(s) Light Therapy Hair System
Classification Name Infrared Lamp per 21CFR 890.5500
Product Code(s) OAP; NHN

IV. Predicate Devices

<u>510(k) Number</u>	<u>Device</u>	<u>Manufacturer</u>
K060305	Hairmax Lasercomb	Lexington International LLC
K032816	Quantum Light Therapy System	Stargate International

VI. Indications For Use

The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

Medically prescribed adjunctive use for the treatment of androgenic alopecia in females;

the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenic (androgenetic) alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

VII. Technological Characteristics

The MEP-90 is a stationary low-level laser device that promotes hair growth and provides adjunctive treatment for androgenic (androgenetic) alopecia in females. The device provides automated and timed equal distribution of laser light to 100% of the scalp.

The MEP-90 operation is controlled by an operating system that affords the user maximum flexibility for individual treatments. The device applies a measured very high tolerance ($\pm 0.76\%$) wavelength (λ) to the scalp stimulating hair growth by the proven concept of biostimulation.

VII. Performance Data And Clinical Efficacy

A multi-phased experimental study was performed with Institutional Review Board (IRB) pre-approval and oversight, in accordance with all applicable references of the Food and Drug Cosmetic Act and Title 21; Code of Federal Regulations.

Androgenic alopecia in women is a chronic medical condition requiring diagnosis, treatment, and monitoring by a licensed medical physician. The condition in women demonstrates both physical and emotional symptoms, which requires addressing by a licensed medical professional.

For the MEP-90 efficacy determination, each subject received a total of 36 each, 20-minute treatments with the MEP-90, over a period of 18 weeks. Results were reviewed at the 10-Week (20 treatment) and 18-Week (36 treatment) levels.

After 20 treatments (10-Weeks), 92% of the subjects demonstrated an increased hair count of $\geq 10\%$ with 57% demonstrating an increase of $\geq 30\%$. 98% of the subjects indicated a medically significant stabilization of their rate of hair loss.

After the 36th treatment, 97% of the subject population demonstrated an increased hair count of $\geq 20\%$. A total of 89% of all subjects demonstrated an increased hair count of $\geq 30\%$, with 57% demonstrating an increased hair count of $\geq 50\%$.

87% of the subjects indicated the treatments have helped their condition, with 60% reporting their loss rate has further slowed down from the 10-week period, and 65% reported their visible area of the alopecia (bald spot) had gotten smaller.

100% of the linear trend plotting for all subjects of their Initial, 10-Week, and 18-Week hair counts demonstrated a historical rate of increased hair growth.

No subject experienced any adverse event and/or effect from the treatments.

VI. Substantial Equivalency

The MEP-90 is substantially equivalent to other pulsed therapeutic light therapy systems currently in commercial distribution. The MEP-90 has the same intended use to the predicate device approved for commercial distribution under 510(k) number K060305 and technological and safety characteristics to the predicate device approved for commercial distribution under 510(k) number K032816.

It exceeds the clinically accepted therapeutic results standards of FDA 510(k) K060305 previously approved light therapy system into a system which provides a more controlled application and larger treatment coverage area at no increased risk to the patient.

The technological equivalence to the predicate devices is substantiated by the wavelength and power output generated by the MEP-90. The MEP-90 provides expanded treatment benefits and regimens for clinical presentations already approved by the Food and Drug Administration for the predicate device.

The MEP-90 is as safe and effective as a combination of the predicate devices listed and numerous others. It has the same intended use of affecting hair growth as the hair growth predicate device (K060305). In addition, the MEP-90 has the same general indications, i.e., treating androgenic alopecia, and the same specific indication of promoting hair growth as the predicate device.

The MEP-90 also has many of the same or similar technological characteristics as a combination of its predicate devices. These include multiple lasers and visible laser wavelength.

The technological differences between the MEP-90 and its predicate devices, specifically the use of red laser to treat androgenic alopecia in females, does not raise new questions of safety or effectiveness for several reasons:

First, the safety and effectiveness profile of the type, wavelength, and power output of this type of laser is well established and previously cleared by the FDA.

Second, FDA's clearance of the predicate device with a much wider wavelength tolerances than the MEP-90's, confirms the favorable risk benefit ratio of visible lasers.

Third, the clinical data acquired confirms both the safety and effectiveness of the MEP-90 for prescription use in promoting hair growth in the intended patient population, despite the difference in technological characteristics between the MEP-90 and K060305. The data demonstrates clear statistical significance of the treatment results obtained and provide mathematical certainty that the results attained did not occur by chance.

These facts exceed FDA's substantial equivalence requirements with respect to the intended use, clinical efficacy, and technological characteristics of the MEP-90.

While there are some technological differences between the MEP-90 and its predicate devices, Midwest conducted an Institutional Review Board approved and monitored clinical study, with the MEP-90, to show that the device functions as intended for its proposed indication for use without any serious side effects or risks.

The clinical and effectiveness data demonstrates that the MEP-90 is effective in promoting hair growth, does not present any safety issues, is classified by the FDA as a non-significant risk (NSR) device, therefore the FDA should approve the medical device by approval of the 510(k).

WIRB® Certificate of Approval

WIRB® (360) 252-2500 1-800-562-4789 FAX: (360) 252-2498	Western Institutional Review Board® Western International Review Board® 3535 SEVENTH AVENUE, SW, OLYMPIA, WA 98502-5010 P.O. BOX 12029, OLYMPIA, WA 98508-2029	Certificate of Approval
THE FOLLOWING WERE APPROVED:		
INVESTIGATOR: Grant F. Koher D.O. 5520-203 McNeely Drive Raleigh, North Carolina 27612	BOARD ACTION DATE: 5/27/2008 PANEL: 5 STUDY APPROVAL EXPIRES: 5/27/2009 STUDY NUM: 1098575 WIRB PRO NUM: 20080612 INVEST NUM: 140351 WO NUM: 1-485401-1 CONTINUING REVIEW: Annually SITE STATUS REPORTING: Annually	
SPONSOR: Midwest RF, LLC PROTOCOL NUM: MEP-90A-CDA AMD. PRO. NUM: TITLE: MEP-90 Hair Growth Stimulation System Data Acquisition Study & Clinical Protocol MEP-90A-CDA		
APPROVAL INCLUDES: Investigator Administrative Letter (05-01-2008) Administrative Letter (05-25-2008) Protocol Consent Form [S0] Advertisement #5561151.0 Brochure Clinical Data Acquisition & Research Study - As Modified		
WIRB APPROVAL IS GRANTED SUBJECT TO: The Board determined that the device as used in this research study is a non-significant risk device. The Board requires that all subjects must be able to consent for themselves to be enrolled in this study.		
IF YOU HAVE ANY QUESTIONS, CONTACT WIRB AT 1-800-562-4789 This is to certify that the information contained herein is true and correct as reflected in the records of the Western Institutional Review Board (WIRB). WE CERTIFY THAT WIRB IS IN FULL COMPLIANCE WITH GOOD CLINICAL PRACTICES AS DEFINED UNDER THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) REGULATIONS AND THE INTERNATIONAL CONFERENCE ON HARMONISATION (ICH) GUIDELINES.		
 Theodore D. Schultz, J.D., Chairman		
		6/2/2008 (Date)
This document electronically reviewed and approved by Orive, Otto on 6/2/2008 1:31:53 PM PST. For more information call Client Services at 1-360-252-2500		

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

Form Approved: OMB No. 0910-0396
Expiration Date: April 30, 2009

DISCLOSURE: FINANCIAL INTERESTS AND ARRANGEMENTS OF CLINICAL INVESTIGATORS

TO BE COMPLETED BY APPLICANT

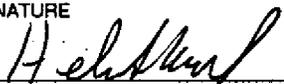
The following information concerning Grant F. Koher, D.O., who participated
Name of clinical investigator
as a clinical investigator in the submitted study MEP-90 Hair Growth Stimulation System Data Acquisition
Name of

Study and Clinical Protocol MEP-90A-CDA is submitted in accordance with 21 CFR part 54. The
clinical study
named individual has participated in financial arrangements or holds financial interests that are required to be disclosed as follows:

Please mark the applicable check boxes.

- any financial arrangement entered into between the sponsor of the covered study and the clinical investigator involved in the conduct of the covered study, whereby the value of the compensation to the clinical investigator for conducting the study could be influenced by the outcome of the study;
- any significant payments of other sorts made on or after February 2, 1999 from the sponsor of the covered study such as a grant to fund ongoing research, compensation in the form of equipment, retainer for ongoing consultation, or honoraria;
- any proprietary interest in the product tested in the covered study held by the clinical investigator;
- any significant equity interest as defined in 21 CFR 54.2(b), held by the clinical investigator in the sponsor of the covered study.

Details of the individual's disclosable financial arrangements and interests are attached, along with a description of steps taken to minimize the potential bias of clinical study results by any of the disclosed arrangements or interests.

NAME Helmut Keidl	TITLE President
FIRM/ORGANIZATION Midwest RF LLC	
SIGNATURE 	DATE May 8, 2009

Paperwork Reduction Act Statement

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Public reporting burden for this collection of information is estimated to average 4 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the necessary data, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information to:

Department of Health and Human Services
Food and Drug Administration
5600 Fishers Lane, Room 14-72
Rockville, MD 20857

Addendum to Form FDA 3455 (Dr. Koher) - Page 1 of 1

An agreement was entered into by and between Midwest RF LLC and Dr. Grant F. Koher; DO (Koher Center For Hair Restoration) on March 5, 2008. Said agreement was titled FDA 510k Data Acquisition Study Agreement and specified any and all financial arrangements between the two principals.

Said agreement also provided a description of expense responsibilities, rights and ownership of the data accumulated, and the equipment used over the course of the Study.

Midwest RF LLC agreed to reimburse Dr. Koher for any and all radio and publication advertising expenses incurred for the solicitation of the Study subjects. These reimbursements consisted of:

- 1) \$ 9,111.18 for radio and newspaper advertisements through 08/28/2008.
- 2) \$ 8,420.69 for newspaper advertisements through 11/12/2008
- 3) \$ 3,210.00 for radio advertisements through 11/21/2008.

Midwest RF LLC provided three prototype MEP-90 Hair Growth Stimulation Systems, and support computers, cameras, and printers for use in the Study. Title to systems is to be transferred to Dr. Koher upon acquiring the data to determine the feasibility of filing a 510(k) with the Food and Drug Administration subject to the following terms:

- In the event Midwest RF LLC determined it was feasible to seek 510(k) clearance, Dr. Koher will receive two production systems at no charge.
- In the event Midwest RF LLC determined the data does not support a regulatory filing, Dr. Koher, at his option, would receive title to the prototype systems.
- Warranty and/or service for either option will be effective the date of transfer.
- Midwest RF LLC will retain title of all support computers, cameras, and printers.
- Dr. Koher will retain copyright and/or any intellectual property rights to the Study data.

No other compensation, and/or agreement, was and/or will be made between the two principals. All other expenses including Study operating expenses, facility expenses, communications, travel, and research team payroll is 100% the responsibility of Dr. Koher.

CV of Dr. Grant F. Koher; DO - Page 1 of 1

**Curriculum Vitae
Grant Franklin Koher, D.O.**

Personal Data

Dr. Grant F. Koher
23112 Umstead
Chapel Hill, North Carolina 27517
1-800-491-9080
drkoher@mindspring.com

Education

Medical D.O. Philadelphia College of Osteopathic Medicine
Philadelphia, PA May, 1982

Undergraduate Bachelor of Science, Chemistry/Premed,
Waynesburg College, Waynesburg, PA May, 1978

Postdoctoral Training

Rotating Internship, Doctor's Osteopathic Hospital, Erie PA 1982

Licenses and Certificates

American Board of Emergency Medicine, 1990
American Osteopathic Board of Family Practice, 1994
American Board of Hair Restoration Surgery, 1998
American Board of Laser Surgery, 1997

Licensed in the Following states:

Ohio Georgia North Carolina Pennsylvania Illinois

Professional Experience

Private Practice, Cosmetic Surgery, Koher Center for Hair Restoration, PA and NC 1991 to present
Medical Director, Medical Hair Restoration, Ohio 2001-2003
Medical Director, Jernigan's Hair Replacement Clinic, North Carolina, 1992 to Present
Private Practice, Family Physicians, PA 1990-1996
Emergency Room Physician, PA 1982 - 1989

Professional Appointments and Activities

See attached CME

Affiliations/Memberships

American Academy of Cosmetic Surgery, Member
American Osteopathic Association, Member
American Society of Hair Restoration Surgery, Charter Member,
International Society of Cosmetic Laser Surgery, Member
World Hair Society, Member
International Society of Cosmetic Laser Surgery, Member
North Carolina Osteopathic Medical Association
Pennsylvania Osteopathic Medical Association
North Carolina Medical Society,
American Hair Loss Council



Determination Of Clinical Efficacy For The MEP-90 Hair Growth Stimulation System

OBJECTIVES: To determine the clinical efficacy of treating females, diagnosed with androgenic (androgenetic) alopecia, with scheduled and controlled timed applications of electromagnetic radiation generated by the MEP-90 Hair Growth Stimulation System. To measure and determine the extent the treated subjects realize measurable new hair growth and/or the reduction of the rate of progression of their ongoing hair loss.

METHODS: As part of a larger experimental study, the efficacy determination was based on the results obtained with 36 scheduled treatments of 20-minute duration with photographic, physical measurement, analysis, and patient surveys after the 20th, and 36th treatment levels. Defined clinical protocol and all procedures were approved on May 27, 2008 by an Institutional Review Board (IRB) in accordance with the Food and Drug Cosmetic Act and Title 21; Code of Federal Regulations.

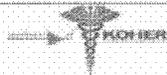
The study commenced in June 2008 with the formal screening of female subjects for androgenic (androgenetic) alopecia. The portion on determining clinical efficacy ended on April 27, 2009. The Study execution was periodically audited and reviewed to insure ongoing compliance with all provisions of:

- 21 CFR §812, Investigational Device Exemptions
- 21 CFR §50, Protection of Human Subjects
- 21 CFR §56, Institutional Review Boards
- 21 CFR §54, Financial Disclosure by Clinical Investigators
- 21 CFR §820 Subpart C, Design Controls of the Quality System Regulation
- 21CFR Subchapter J §1010
- 45CFR §46

The validation of the MEP-90's clinical efficacy required two hypotheses be confirmed:

- After 10-Weeks (20 treatments), more than 50% of the subjects demonstrated an increased hair count of $\geq 10\%$ at the 10-week level.
- After 18-Weeks (36 treatments), more than 50% of the subjects demonstrated an increased hair count of $\geq 20\%$ at the 18-week level and/or a reduction in their rate of hair loss.

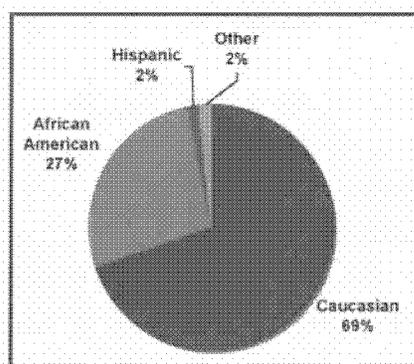
Certification Of Clinical Efficacy For The MEP-90 - Page 2 of 6



MEP-90 Clinical Efficacy
May 4, 2009
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RESULTS: A total of 157 subjects were screened with 82 being accepted with a medical diagnosis of androgenic alopecia based on physical examination and meeting specified criterion regarding medical history, degree of hair loss, and subject skin typing.

The 10-Week ethnicity distribution was as follows:



The Study was approved by the IRB on the condition of having a minimum ending population of 50. Dropouts, excessive missed appointments, and one corrected diagnosis reduced the population to 63 at the 10-week level, and to 60 at the 18-week level.

The data acquired during the Study was obtained through the screening questions' response, physical examination, photographic examination, subject questionnaires, global comparisons, and microscopic hair count comparisons.

This data included, but was not limited to:

- ≥ 150 formal 15-20 minute Informed Consent Presentations
- ≥ 150 formal 45-minute Clinical and Diagnostic Screenings
- Generation and analysis of over 2,550 global and microscopic images
- Over 2,400 treatments
- Generation and processing of 124 Subject Questionnaires
- Individual marking and counting of $\geq 35,000$ hairs

10-Week (20 Treatments) Results

82 female subjects were accepted for the Study. The first treatment administered was on August 13, 2008. The last Phase 1 (10-Week) treatment was administered on March 3, 2009.¹ 19 additional subjects were excluded, after commencement of the Study and through the end of Phase 1, due to:



- Four failed to show for their first treatment
- 13 missed excessive appointments
- One was determined to have lichen planopilaris
- One decided to try and become pregnant

58 of the 63 female subjects confirmed the Phase 1 hypothesis by presenting hair growth of $\geq 10\%$ after 10-Weeks and 20 treatments. To indicate by plotting, 92% of the subjects demonstrated an increased physical hair count of $\geq 10\%$:



The 10-Week distribution of hair count change was as follows:

Phase 1 Subject Hair Count Distributions	Number	Percentage
Hair growth between $\leq 1\%$ to 10%	5	8%
Hair growth between 11% to 20%	8	13%
Hair growth between $\leq 21\%$ to 30%	12	19%
Hair growth between $\leq 31\%$ to 40%	9	14%
Hair growth between $\leq 41\%$ to 50%	8	13%
Hair growth $\geq 51\%$	21	33%
Total	63	100%

Subjects were also evaluated and scored on the 20 treatments; Impact On Existing Hair; Stabilization Of Hair Loss; and Impact On The Hair Growth Cycle. In addition to the clinical analysis, all subjects were required to fill out and execute a questionnaire.

Impact On Existing Hair – Clinically, 65% of all subjects' presented "medically significant" results, 32% demonstrated "statistically significant," and 3% demonstrated a limited "cosmetic benefit" results. 67% of all subjects stated there was noticeable improvement.

Stabilization Of Hair Loss – Clinically, 98% of the population presented a stabilization of their rate of hair loss. 68% of all subjects stated their rate of hair loss was slower than it had been prior to receiving treatment. 27% indicated that their loss rate was the same as it was prior to treatment. 5% indicated their rate of hair loss had progressed at a faster rate.

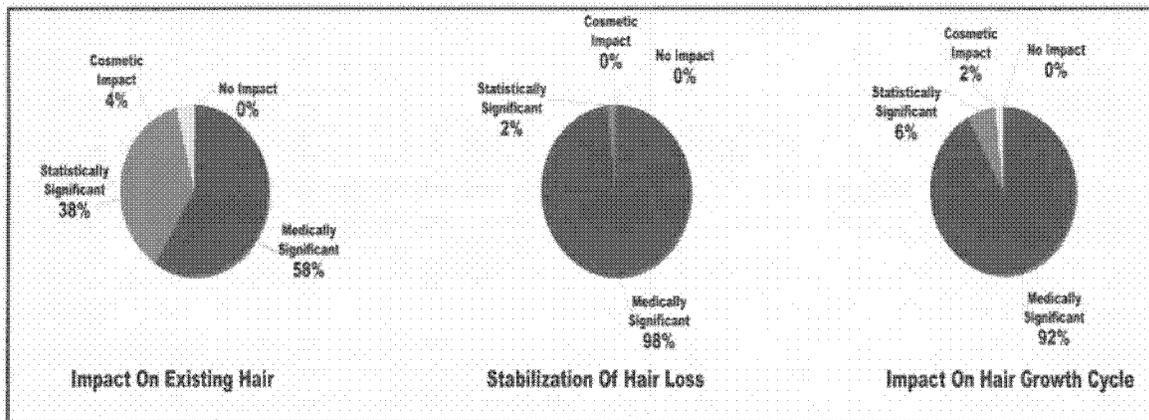
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Impact On Hair Growth Cycle - Clinically, 92% of all subjects' presented "medically significant" results, 6% demonstrated "statistically significant" results, and 2% demonstrated a limited "cosmetic benefit." 67% of all subjects stated there was noticeable improvement.

The Phase 1 Scoring results were as follows:

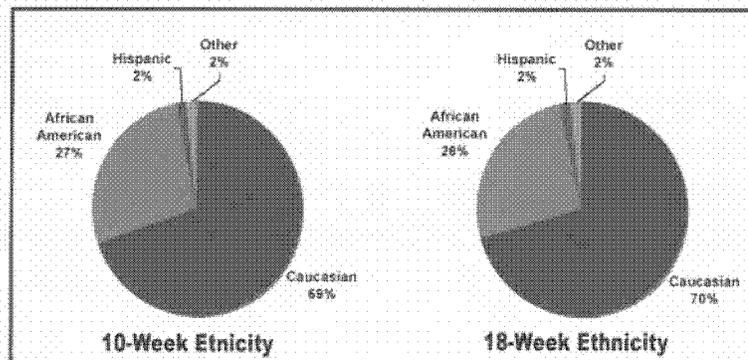


18-Week (36 Treatments) Results

60 of the 63 subjects who completed 10-weeks completed the 18-week (36 treatments) phase. Three additional subjects were excluded due to:

- Work related scheduling conflict
- Missed excessive treatments
- Non study related death

There was no significant change ($\pm 2\%$) to the ethnicity distribution from Phase 1.



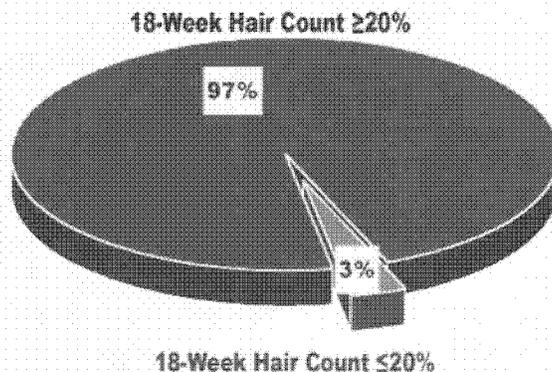
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97% of those subjects presented an increased hair count of $\geq 20\%$:



The 18-Week distribution of Subjects' hair growth results for Phase 2:

Phase 2 Subject Hair Count Distributions	Number	Percentage
Hair growth between $\leq 1\%$ to 19%	2	3%
Hair growth between 20% to 30%	5	8%
Hair growth between 31% to 40%	10	17%
Hair growth between 41% to 50%	9	15%
Hair growth $\geq 51\%$	34	57%
Total	60	100%

87% of the subjects reported the treatments had helped their condition, with 60% of the subjects reporting their rate of hair loss has noticeably slowed down between the 10-week and 18-week treatment levels, and 65% reported their visible area of the alopecia (bald spot) had gotten smaller since the start of treatments.

CONCLUSIONS:

- The data validates the MEP-90 to be clinically effective for treating female patients who present themselves with androgenic (androgenetic) alopecia; have both a Ludwig and Savin Female Hair Loss Scale classification of I to II; and a Fitzpatrick Skin Types I to IV (population).
- Due to the mimicking of other types of alopecias' symptomology and causes, the treatments should only be prescribed by a licensed physician based on a formal medical diagnosis.

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Certification Of Clinical Efficacy For The MEP-90 - Page 6 of 6

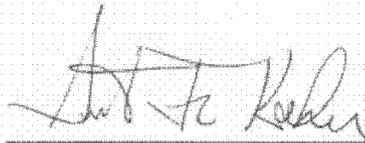


MEP-90 Clinical Efficacy
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- A licensed physician should monitor all MEP-90 treatments due to the medical issues raised by the patients and their emotional vulnerability due to the affliction's impact.

CERTIFICATION

I certify that, in my capacity as the Principal Investigator of the MEP-90 Hair Growth Stimulation System Data Acquisition Study & Clinical Protocol Results (MEP-90A-CDA), I believe to the best of my knowledge, that all data and information submitted in this report is truthful and accurate and that no material fact has been omitted.



Signature

Grant F. Koher, D.O.
Principal Investigator

May 4, 2009

Date

20080612

WIRB[®] Protocol Number

MEP-90 Hair Growth Stimulation System SPECIFICATIONS

Specifications - General

The MEP-90 Hair Growth Stimulation System is a non- heating lamp as described under the provisions of 21CFR 890.5500 and is clinically indicated for adjunctive use in the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II, and, who have been determined to have a Fitzpatrick Skin Typing of I to IV.

An Alternating Current (AC) power adapter converting AC to 24 Volts DC powers the MEP-90.

The basic system configuration consists of:

- MEP-90 Hair Growth Stimulation System Console w/ PC, 19" LCD Monitor, 1ea Wireless Computer Keyboard, 1ea Wireless Computer Mouse, and 1ea 10' Medical Grade Power Cord
- 2ea MEP-90 Safety Lock Keys
- 1ea MEP-90 Operation Manual
- 2ea Operator and Patient Laser Safety Glasses
- 1ea MEP-90 Warranty Registration Card

(b)(4)

The MEP-90 System Console is equipped for wireless internet and provides the following outputs:

- 1 Ethernet connection
- 8 USB2 connections (4 Available)
- 2 Audio out connections
- 1 VGA video out connections
- 1 Audio in connections
- 1 Video in connections (NTSC)

The MEP-90 Control Unit's powers 82 each 650nm visible, diffuse beam treatment lasers and one each 875nm infrared safety LED. The 82 treatment lasers are controlled by a fixed DC signal generator.

(b)(4)

Additional, but separately functioning, applications for image processing and recordkeeping are available. All applications require factory loading as part of the final production testing and installation.

Standards

The MEP-90 meets and/or exceeds the relevant sections of the following standards:

IEC 60601-1 International Electro technical Commission, Medical Electrical Equipment, Part 1: General Requirements for Safety

UL 94 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

Federal Laser Product Performance Standard

IEC 60825-1 CORR 1 Safety of Laser Products

ISO 10993 Biocompatibility

45CFR Part 15B

Operational Specifications

The MEP-90 System has the following validated operational specifications:

1.1 Laser Emission Coverage

Emissions from the lasers diodes cover 95% of the patient therapy area at the working distance. Laser emissions are diffuse, not focused.

1.2 Laser Emission Wavelength

Laser emissions shall be at 650nm ($\leq +0.76\%$) measured

1.3 Laser Emission Power Output

Maximum emission power shall be $\leq 3\text{mw/cm}^2$ measured.

1.4 Laser Operating Voltage

3.2 VDC @ 50mA

1.5 Laser Operating Temperature Range

Lasers shall have the specified power output at the specified wavelength over the temperature range of -10 to 50 degrees C.

2. Operational and Storage Environment

2.1 Operational Environment

The MEP-90 shall operate normally in the following indoor environmental conditions:

Temperature: 50°F to 104°F (10°C to 40°C)

Humidity: 15% to 90% noncondensing

2.2 Storage Environment

The MEP-90 shall operate normally after storage in the following enclosed environmental conditions:

Temperature: -4°F to 122°F (-20°C to 50°C)

Humidity: 15% to 90% non condensing

Note: Warm up to operating temperature is required if stored at temperatures below normal operating temperatures.

3. Laser Safety

3.1 Key Switch Lock

Laser operation can only occur when a keyed switch is in the ON position. A message shall be displayed on the operator display when the key switch is in the locked position.

3.2 Patient Interlock

There is an interlock device that allows the lasers to only function when the patient's head is present in the laser dome. A message shall be displayed on the operator display when the patient interlock is locking out laser function because the patient's head is not present in the laser dome.

(b)(4)

4. Laser/Patient Interface

4.1 Distance From Patient

The laser dome is designed such that all lasers are positioned approximately 1-2 inches from the therapy area of the patient's head.

(b)(4)

4.3 Safety Glasses

Two pair of laser safe eye protective goggles shall be provided with the system. These goggles block the wavelength (l) of the following:

- OD 5+ @ 190-375 nm
- OD 2-3 @ 630-660 nm
- OD 3+ @ 660-690 nm
- OD 6+ @ 690-700 nm
- OD 6+ @ 10,600 nm

5. Patient Interface

5.1 Laser Dome

The Laser dome is large enough to accommodate a 99th percentile male head with maximum 1" space between the patient's head and the face of any laser in the dome.

The laser dome does not cover any area of the patients face.

The laser emission pattern covers the entire hair growth area of the head, not including the face and neck, of a 99 percentile male head.

The Laser pattern covers the entire therapy area at the working distance.

5.2 Patient Positioning

The Laser dome can travel from the center of the dome to the floor with a maximum range of 44" to 64."

The Laser dome travel is controlled by the operator with the operator controls.

The Laser dome will stop movement in the downward direction if contact with the patient or any other obstruction occurs. The Laser dome will maintain upward positioning ability in this event.

Adequate clearance exists for a chair or other seating surface to be positioned for the patient to be seated in during treatment.

(b)(4)

6. Operator Interface

(b)(4)

6.1.1 The available Operator Controlled Functions are:

- 6.1.1.1 Laser Dome up and down movement over the travel limits.
- 6.1.1.2 Treatment "Start", "Stop" and "Pause".
- 6.1.1.3 Laser dome height oscillation on and off.
- 6.1.1.4 Laser dome height oscillation distance.
- 6.1.1.5 Laser dome height oscillation dwell time.
- 6.1.1.6 Treatment time adjustment between 0 and 60 minutes.
- 6.1.1.7 Running countdown of remaining treatment time during treatment.
- 6.1.1.8 Notification when treatment has been stopped or paused.
- 6.1.1.9 Notification that treatment has started and running
- 6.1.1.10 Notification that key switch has been locked.
- 6.1.1.11 Notification that laser dome has hit an obstruction.
- 6.1.1.12 Laser on time (duty cycle) adjustment.

6.1.2 The available Operator Controllable Settings are:

- 6.1.2.1 Laser height oscillation distance default.
- 6.1.2.2 Laser dome height oscillation dwell time default.
- 6.1.2.3 Treatment time default.
- 6.1.2.4 Laser on time (duty cycle) default.

6.1.3 Software Safety Requirements

6.1.3.1 If obstruction safety switch is actuated, lasers will off and machine will go into pause mode if in the middle of a treatment. Laser dome “up” function will continue to function. Once the obstruction is cleared the treatment time can be resumed from where it was interrupted if the device was in the middle of a treatment.

6.1.3.2 When a treatment is paused using the pause function, the laser dome “up” function will continue to operate. Upon restarting of the treatment, via the “Start” function, the treatment will be resumed with the remaining time indicated when the “Pause” function was activated.

6.1.4 Hardware Controls

A power switch that activates power to the entire system including peripherals and accessories is provided. The switch meets all UL requirements.

7. Power Requirements

7.1 Input Power

Device shall operate normally with:
85VAC – 265VAC at 50/60Hz

7.2 Computer and Periphery Power

Two switched and fused outlets are provided on the device itself for powering the operational computer and another periphery device.

7.3 Hardware Power Requirements

24VDC @ 10 amps
12VDC @ 10 amps
3VDC @ 10 amps

8 System Enclosures

8.1 Housings

(b)(4)

8.2 System Enclosure Mobility

Casters are provided for mobility of the system enclosure. Two of the casters are lockable and swivel 360 degrees.

8.3 System Enclosure Size

System enclosure is a maximum of 30" in both length and depth so as to fit through entrance and passage doors. The height of the system enclosure allows for passage through entrance and passage doors.

8.4 System Enclosure Controls

8.4.1 Control Display

A horizontal work surface shall be provided at desk height with space to support the control display.

8.4.2 Control Keyboard

A horizontal work surface shall be provided at desk height with space to support the control keyboard.

8.4.3 Control Mouse

A horizontal work surface shall be provided at desk height with space to support the control mouse.

8.4.4 Controls Work Surface Adjustability

Operator controls work surface is adjustable in three positions as it relates to the laser dome position; 90° to the right, 90° to the left and 180° to the rear. This adjustment can be made by authorized service personnel only.

MEP-90 Hair Growth Stimulation System

LABELING AND SAFETY

The MEP-90 Hair Growth Stimulation System meets labeling, and safety standards required by the following regulations:

Performance

21CFR - Subchapter J - Part 1010
47CFR - Part 15B

Labeling

21CFR - Subchapter H - Part 801
21CFR - Part 820 - Subpart K - §820.120
21CFR - Chapter I - Subchapter J - Part 1010 – Subpart A - §1010.3

Safety

21CFR - Subchapter J - Part 1010

The MEP-90 will only operate with AC power. Both operator and any patient contact with the MEP-90 are with non-conducting materials. The maximum operating power within the system mainframe is $\leq 24v$ DC. The power output through the applicator connecting cable to the head is $\leq 3v$ DC.

In the unlikely event of any short/overload within either the connecting cables or the unit, the system automatically shuts down. In addition, the MEP-90 has a thermal unit which automatically shuts the unit down in the event of excess heat.

The MEP-90 is specified as a “radiation emitting device under “21CFR - Subchapter J - Part 1010.” Midwest RF complies with all warning requirements for both user and patients. This is accomplished by a series of safety features and warning labels as specified on pages **XX-XX**.

All accompanying literature, including the MEP-90 Operation Manual, cautions the user about their responsibilities and proper operation of the system:

WARNING: IT IS MANDATORY THAT THE USER READ AND BE FAMILIAR WITH THE ENTIRE CONTENTS OF THIS OPERATION MANUAL FOR PROPER AND SAFE UTILIZATION OF THE MEP-90 HAIR GROWTH STIMULATION SYSTEM AND ALL ACCESSORIES. REVIEW AND/OR FAMILIARITY WITH THE SOFTWARE IS NOT A SUBSTITUTION FOR READING AND UNDERSTANDING THIS MANUAL IN ITS ENTIRETY.

All literature, manuals, and/or public information shall cite the following:

FEDERAL LAW RESTRICTS THIS DEVICE TO SALE TO OR USAGE ON THE ORDER OF A LICENSED PHYSICIAN OR PRACTITIONER LICENSED BY THE LAWS OF THE STATE IN WHICH THAT PERSON PRACTICES.

Each system is labeled on the back of the mainframe with the required information according to 21CFR§801. This includes serial number; special instructions; electrical specifications; and the location of manufacture and final assembly:



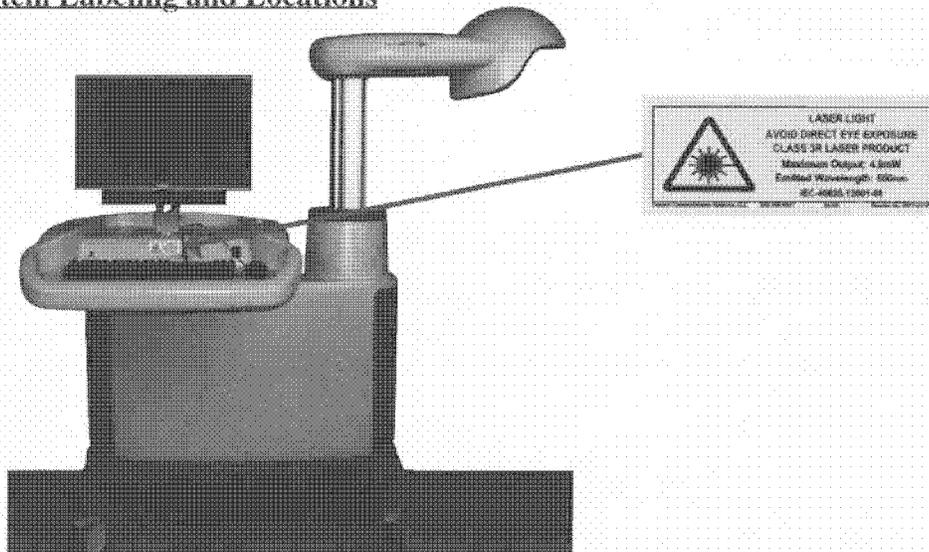
All systems are tracked by the serial number in the Midwest RF sales database. Systems are also tracked and cross referenced by:

<i>Assembly Date</i>	<i>Software version</i>	<i>Listed Component</i>
<i>User/Purchaser</i>	<i>Sales Invoice Number</i>	<i>Installation/Service History</i>

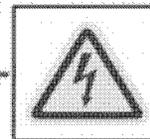
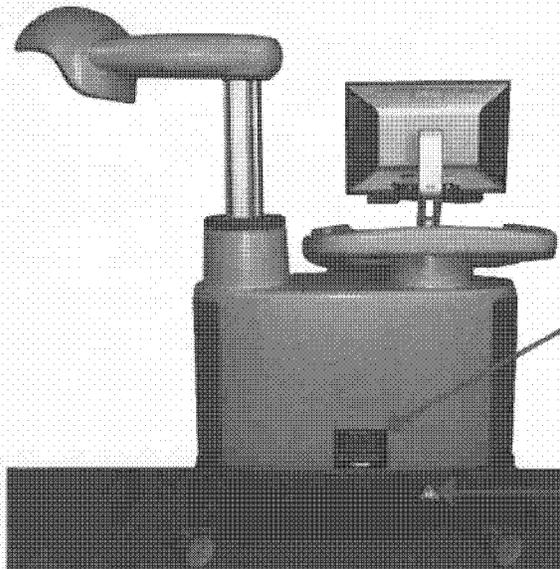
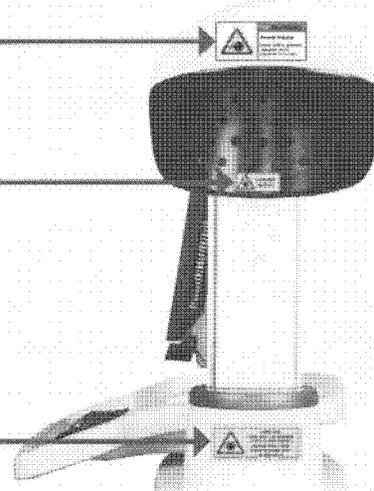
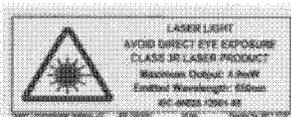
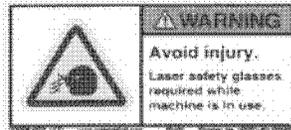
The MEP-90 Hair Growth Stimulation System **Operation Manual** complies with 21CFR-Part 801 §801.5 with regards to providing adequate "Directions For Use (See Appendix 1).

The MEP-90 Hair Growth Stimulation System **Specification Flyer** complies with 21CFR-Part 801; 21CFR-Part 820; and 21CFR-Part 1010 (See Appendix 2).

MEP-90 System Labeling and Locations



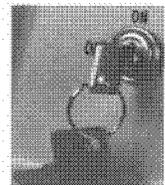
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MEP-90 System Additional Operating Safety Features

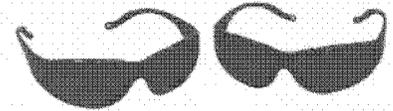
In addition, there are user and patient safety features that were designed into the MEP-90 that are an integral part of its operation:

- **Safety Keylock Assembly** - The lasers will not operate unless the Safety Keylock is turned to the ON position. As described on page 13, a message will also appear on the screen indicating that the "keyswitch is OFF."
- **Default Override Limitations** - Although the user has the option to change the default settings, the maximum variations of custom settings still fall within the published limitations as to the maximum amount of power output which is $\leq 5\text{mW/cm}^2$.



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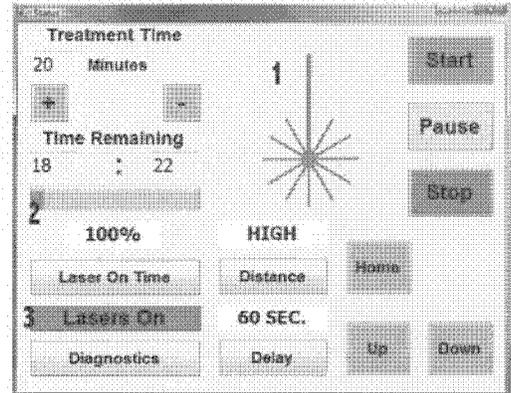
- **Laser Safety Goggles** - The MEP-90 is shipped with two pair of laser safety goggles. Both the operator and the patient should wear these goggles **anytime** the lasers are to be activated. These are not some form of sunglasses. They are goggles that have special lenses that protect the eyes from the wavelength (λ) of the lasers used by the MEP-90.



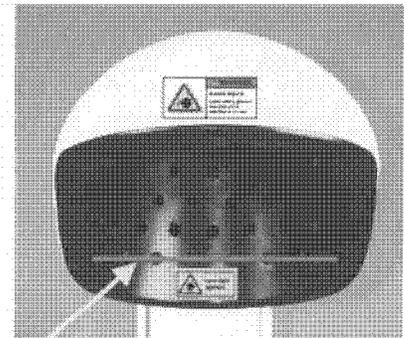
- **Laser Safety Goggles Warning**- After using the mouse to START the laser treatment, the following reminder warning appears on the display screen.



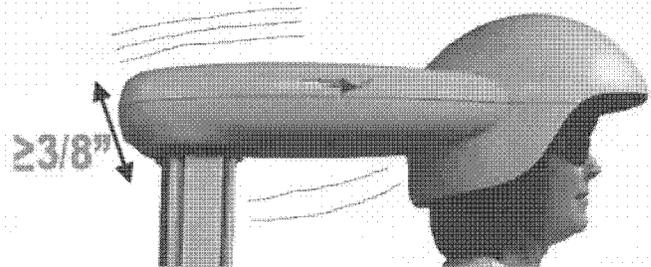
- **Lasers On Indicators** Whenever the lasers are powered on, the Operation Display Screen will display (1) a "flashing" laser symbol, a status bar (2) indicating treatment received, and the laser indicator will change (3) from Lasers Off to Lasers On (see below).



- **Thru-Beam Interrupt Shut Off** When the MEP-90 is generating a treatment, should this beam be NOTBROKEN/INTERRUPTED by the patient's head, the MEP-90 immediately stops the therapy, and shuts off the lasers.



- **Hood Tilt Shut Off** When the MEP-90 is generating a treatment, should the Light Therapy Hood Assembly tilt or tip more than 3/8", the MEP-90 immediately stops the therapy.



- **Hood Proximity Switch** - Inside the Treatment Head is a proximity switching circuit that controls the distance between the head and the patients scalp. Anytime the inside of the Treatment Head comes within 1/2" of the patient's scalp, the head will no longer move DOWN.

MEP-90 System Comparisons To Predicate Devices

<u>Device</u>	<u>Manufacturer</u>	<u>Output</u>		<u>Regulation</u>		<u>Product</u>	<u>Product</u>
		<u>Power*</u>	<u>Wavelength</u>	<u>Number</u>		<u>Code</u>	<u>Nomenclature</u>
MEP-90	Midwest RF LLC	≤4.5mw/cm ²	650nm (+±1%)	21CFR §890.5500		OAP NHN	Lamp, Infrared

Identification/Classification: - 21CFR; §890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating).

* = Per diode

<u>Device</u>	<u>Manufacturer</u>	<u>Output</u>		<u>Regulation</u>		<u>Product</u>	<u>Product</u>
		<u>Power*</u>	<u>Wavelength</u>	<u>Number</u>		<u>Code</u>	<u>Nomenclature</u>
HairMax K060305	Lexington Int'l	≤5mw/cm ²	650nm (+±5%)	21CFR §890.5500		OAP	Lamp, Infrared

Identification/Classification: - 21CFR; §890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating).

<u>Device</u>	<u>Manufacturer</u>	<u>Output</u>		<u>Regulation</u>		<u>Product</u>	<u>Product</u>
		<u>Power*</u>	<u>Wavelength</u>	<u>Number</u>		<u>Code</u>	<u>Nomenclature</u>
Quantum K032816	Stargate Int'l	≤5mw/cm ²	650nm (+±5%)	21CFR §890.5500		NHN	Lamp, Infrared

Identification/Classification: - 21CFR; §890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating).

The MEP-90 Hair Growth Stimulation System has the same intended use and/or technological characteristics as the predicate devices.

- 1- The MEP-90 System is substantially equivalent to predicate device K060305 for adjunctive use in providing treatment of androgenic (androgenetic) alopecia.
- 2- The MEP-90 System is substantially equivalent to predicate device K060305 for stimulating hair growth in patients diagnosed with androgenic (androgenetic) alopecia.
- 3- The MEP-90 System meets the clinical application criterion of predicate device K060305 in that it provides identical treatment coverage of the anatomical area called for by a current medically accepted protocol.

- 4- The MEP-90 System utilizes the same wavelength low-level laser as the predicate device K060305, i.e. 650nm ($\pm 5\%$). The acceptable range of the lasers used by the MEP-90 System is from 650nm to 650.8nm which exceeds the published tolerance of the predicate device K060305, which operates at 618nm to 683nm.
- 5- The MEP-90 System is capable of obtaining the identical clinical results as the predicate device K060305 due to its technology and design. The MEP-90 System utilizes the same laser technology as the predicate device K060305 and its clinical efficacy was confirmed based on IRB approved clinical trials performed in 2008-2009.
- 6- The current accepted protocol for treatment calls for the application of the device K060305 to be brushed through the entire scalp area in order to cover the afflicted area. This requires dependence on the patient to insure total coverage of the affected area. The MEP-90 System's total scalp area coverage design provides consistency of application and results. However, the anatomical area(s) treated are identical to the predicate device K060305.
- 7- The power output of the lasers in the MEP-90 System are identical to the predicate devices K060305 and K032816, and do not raise any safety or efficacy issues.
- 8- The different quantity of energy sources between the MEP-90 System (84) and the predicate devices; (K060305 - one) (K032816 - one, two, or four) does not raise any safety and/or efficacy issues with respect to power output regarding total surface area covered.
- 9- The different quantity of energy sources between the MEP-90 System (84) and the predicate devices; (K060305 - one) (K032816 - one, two, or four) does not raise any safety and/or efficacy issues with respect to power output regarding time.
- 10- The comparison of patient contact materials of construction for the MEP-90 System do not raise any biocompatibility issues when compared to K060305 and K032816 as no patient contact is required and the materials have been verified to be biocompatible.

The MEP-90 SYSTEM is substantially equivalent to the predicate devices as it has the same intended use; technological characteristics; energy delivered; materials, performance, safety, effectiveness, labeling, biocompatibility, and meets the same regulatory standards.

MEP-90 Hair Growth Stimulation System

REGULATORY COMPLIANCE AND PERFORMANCE TESTING

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In addition to Midwest RF's internal regulatory compliance requirements, the MEP-90 is manufactured and tested to comply with the following standards:

- 21CFR - Part 820
- 21CFR - Subchapter J-Part 1010
- IEC 60601-1-2
- FCC Standard – 47CFR Part 15B
- All electrical components utilized are UL® approved



**MEP-90
Final Test Report**

Serial #: _____

Assembly Date: _____

Tested By: _____

(b)(4)



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	Testing Procedure	Results (✓)
(b)(4)		

System Serial#: _____

Page 2 of 4 Pages

Test Engineer Initials: _____

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Testing Procedure	Results (✓)
(b)(4)	

System Serial#: _____

Page 3 of 4 Pages

Test Engineer Initials: _____

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Testing Procedure	Results (✓)
(b)(4)	

System Serial#: _____

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MEP-90 Risk Analysis

(August 15, 2007 – May 1, 2009)

Scope

This Risk Analysis is focused on the MEP-90 Hair Growth Stimulation System's product development. It covers the functionality and operational aspects of the system from design through delivery.

Overview

As a part of the investigation and research of design, manufacturing, and the distribution of the MEP-90 Hair Growth Stimulation System, an ongoing assessment of Risk Analysis was conducted that commenced in August of 2007. The objective was to insure the awareness of Midwest RF LLC's position with regards to any potential adverse consequences involving the following:

I. Liability Considerations

MEP-90 Performance
MEP-90 Operational Software
Potential for Personal Injury
Operational Safety
Clinical Contraindications of Use

II. Regulatory Considerations

Food And Drug Administration (FDA)
Department of Health and Human Services (HHS)
Federal Communications Commission (FCC)
Occupational Safety and Health Administration (OSHA)
Foreign Regulatory Standards

I. Liability Exposure Considerations

MEP-90 Performance - A standard published warranty and service statement will be provided to all purchasers of the MEP-90 as part of the terms and conditions of sale. Liability of the corporation will be published as limited to the repair and/or replacement of any defective device provided the terms of the Midwest RF LLC warranty have been met by the purchaser.

Any repair and/or replacement will be internally controlled by Midwest RF and will utilize a material tracking system down to component level. (See FDA Regulatory Considerations)

(b)(4)

This will require formal software verification and validation procedures, subject to compliance with current Food and Drug Administration regulations.

Personal Injury - There are no known risks for any type of personal injury that can be generated by the MEP-90. The system uses visible lasers of 650nm ($\leq \pm 1\%$ measured) as its energy source, which has not proven to be damaging to human tissue.

The Food and Drug Administration classifies this device as a "non-significant risk" (NSR) device. The lasers do not carry the high potential for injury to the eye, as do infrared lasers used by other light therapy devices. However, the system will have a clear series of "Safety and Warning Labels" informing the user and patient not to look directly into the light. Operation of the MEP-90 will require the wearing of safety glasses by both the operator and the patient being treated. This labeling must meet the requirements of both the Federal Laser Product Performance Standard and IEC 60825-1 CORR 1 Safety of Laser Products.

Operational Safety – The only potential operational safety issue associated with the MEP-90 would be some form of electrical shock due to gross mishandling and/or destructive abuse. This includes no known potential risk(s) to the clinical operator and/or the patient. There is no operator/patient direct contact that would allow DC voltage to reach either.

Clinical Contraindications of Use – All recommended clinical contraindications of use shall be listed in the MEP-90 Operation Manual. Sale of the MEP-90 will be limited to licensed physicians and Midwest RF LLC will publish that usage of the MEP-90 will be by prescription only.

II. Regulatory Compliance Considerations

Food and Drug Administration (FDA) – The United States Food and Drug Administration (FDA) is the primary regulatory agency covering manufacturing, marketing, and commercial distribution the MEP-90 Hair Growth Stimulation System.

Under the provisions of Title 21; U.S.C. and 21 Code of Federal Regulations (CFR) both Midwest RF, LLC and the MEP-90 must meet certain regulatory standards and comply with specific FDA regulations. These are. But are not limited to:

Initial Registration of Device Establishment – Midwest RF, LLC currently has the status as an “approved FDA manufacturing establishment.” This approval addresses “Good Manufacturing Practices that are mandated to be adhered to. Midwest RF, LLC “Establishment Registration Number” is: **2134565**.

Device Listing - All medical devices sold and distributed within the United States and its territories are required to be registered with the FDA. This requirement will be met by the filing of the current FDA Form 2892 prior to filing of the 510k application.

FDA Approval To Market The MEP-90 Hair Growth Stimulation System – We will be required to file, and have approved by the FDA, a “510(k) Application,” which is the notification to the FDA of Midwest RF LLC’s intent to market the device and enter into commercial distribution of the MEP-90 within the United States and all its territories. The FDA, prior to any marketing of the MEP-90, must formally approve this application.

We will file the application indicating the device can be used only by prescription of a licensed physician. Although the physician user of the MEP-90 will decide what clinical protocol to utilize, Midwest RF LLC, and all entities and personnel representing the MEP-90, will be restricted to presenting only the usage approved by the FDA in all published literature and/or operation instructions. Initially, we will limit our marketing efforts to the following utilizations approved by the FDA, i.e.:

- *Adjunctive use in the treatment of androgenic (androgenetic) alopecia in females;*

and/or

- *Promotion of hair growth in females with androgenic alopecia who have Ludwig and Savin Female Hair Loss Scale classifications of I to II and Fitzpatrick Skin Types I to IV;*

and/or

- *Reduction in the rate of hair loss for females with androgenic alopecia who have Ludwig and Savin Female Hair Loss Scale classifications of I to II and Fitzpatrick Skin Types I to IV*

Software Verification and Validation – As part of the FDA’s 510(k) approval process, specific data must be included in the application for any device that utilizes software in its operation.

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This includes an FDA defined criterion called “level of concern” with regards to the potential type/impact of any injury that could be caused by improper usage and/or failure of the device. This is further defined by what FDA classification of injury could occur, i.e., “minor” or “serious” in accordance with 21 CFR 803.3(bb)(1).

In the event of any improper usage and/or failure of the MEP-90, the FDA defines the level of concern (Major, Moderate, Minor) to be applied, based on the responses to point specific questions.

FDA’s Major Level of Concern Responses

1. Does the Software Device qualify as Blood Establishment Computer Software? (Blood Establishment Computer Software is defined as software products intended for use in the manufacture of blood and blood components or for the maintenance of data that blood establishment personnel use in making decisions regarding the suitability of donors and the release of blood or blood components for transfusion or further manufacture.)	MEP-90 = NO
2. Is the Software Device intended to be used in combination with a drug or biologic?	MEP-90 = NO
3. Is the Software Device an accessory to a medical device that has a Major Level of Concern?	MEP-90 = NO
4. Prior to mitigation of hazards, could a failure of the Software Device result in death or serious injury, either to a patient or to a user of the device? Examples of this include the following:	MEP-90 = NO
a. Does the Software Device control a life supporting or life sustaining function?	MEP-90 = NO
b. Does the Software Device control the delivery of potentially harmful energy that could result in death or serious injury, such as radiation treatment systems, defibrillators, and ablation generators?	MEP-90 = NO
c. Does the Software Device control the delivery of treatment or therapy such that an error or malfunction could result in death or serious injury?	MEP-90 = NO
d. Does the Software Device provide diagnostic information that directly drives a decision regarding treatment or therapy, such that if misapplied it could result in serious injury or death?	MEP-90 = NO
e. Does the Software Device provide vital signs monitoring and alarms for potentially life threatening situations in which medical intervention is necessary?	MEP-90 = NO

FDA’s Moderate Level of Concern Responses

1. Is the Software Device an accessory to a medical device that has a Moderate Level of Concern?	MEP-90 = NO
2. Prior to mitigation of hazards, could a failure of the Software Device result in Minor Injury, either to a patient or to a user of the device?	MEP-90 = NO
3. Could a malfunction of, or a latent design flaw in, the Software Device lead to an erroneous diagnosis or a delay in delivery of appropriate medical care that would likely lead to Minor Injury?	MEP-90 = NO

Any malfunction and/or unknown at this time design flaw will be of "minor concern" with regards to patient and user safety.

(b)(4)

Clinical Efficacy of the MEP-90 - Due to several controversial situations over the past five years concerning this application of light therapy, a formal data acquisition and clinical study will be executed by an independent physician at an independent clinical site.

The purpose of this study will be two fold:

- 1- The gathering of effectiveness data regarding the performance of the MEP-90 as it applies to the intended utilizations.
- 2- The formal determination, supported by independent statistical analysis, as to the clinical worthiness of the technology for this application

This will be an experimental type of clinical and data acquisition study. It will determine the clinical, technological, and regulatory efficacy of therapeutic treatments using the MEP-90 Hair Growth Stimulation System. These determinations are to be based on the application of specifically timed treatments, at specified intervals, to medically diagnosed female subjects with androgenic (androgenetic) alopecia.

The Study will be conducted under the direct supervision of a licensed physician, with strict adherence to all provisions of Title 21, U.S.C.; Title 21, Code of Federal Regulations; Title 45, U.S.C.; and Title 45, Code of Federal Regulations. The type, methodology, protocol, and execution of the Study are to be pre-approved by a properly sanctioned Institutional Review Board (IRB).

Since Midwest RF LLC is a FDA Registered Establishment manufactured the MEP-90 systems used, 21CFR§812 Investigational Device Exemption shall apply.

Medical Device User Fee – The 510(k) submission requires the payment of a Medical Device User Fee (MDUF) to the FDA prior to the filing of the 510(k) application. Proof of payment is an integral part of the 510(k) application, i.e., a copy of the FDA Form 3601. For FY2009, the MDUF is \$3,693.

Good Manufacturing Practices - Midwest RF, LLC is required to adhere to FDA defined Good Manufacturing Practices (GMP) (21 CFR Part 820). The FDA has the authority to inspect any or all Midwest owned entities involved in the design, manufacture, packaging, labeling, storage, installation, and servicing of the MEP-90. This will also apply to the primary sales and marketing arm that will be Life Physics International.

FDA Regulations (General) - The MEP-90 is classified as a Class II Medical Device. It is regulated by the provisions of 21CFR 890.5500 as an "infrared lamp." It will probably be classified under a specific product code, i.e., "OAP," or a new one if the FDA chooses. The device carries an "NSR" rating indicating it has "Non Significant Risk" to the user and/or patient.

Federal Communications Commission (FCC) - All commercial electronic devices (unintentional radio-frequency radiators) destined for sale in the United States that have clocks/oscillators that operate at a frequency of greater than 9 kHz and use digital techniques are regulated by the Federal Communications Commission (FCC) under Rules and Regulations, Title 47, Part 15 Subpart B. The MEP-90 design incorporates that consideration and meets the standard called for under Rules and Regulations, Title 47, Part 15 Subpart B.

Occupational Safety and Health Administration (OSHA) - There are no anticipated risk of work-related injury (repetitive or otherwise) and/or illness to any Midwest employee in the execution of their employee duties. Midwest complies with all OSHA standards and requirements.

There are no anticipated risks of work-related injury (repetitive or otherwise) and/or illness to any user in the execution of their work-related duties.

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MEP-90 Service Statement and Procedures

The MEP-90 Hair Growth Stimulation System was designed so that there is minimal maintenance steps required by the user. Any maintenance required to be performed by the user, other than keeping the items clean and stored in the proper environment, is spelled out in the MEP-90 Operation Manual.

All repair and/or service to the MEP-90 System must be done at and/or by an authorized Midwest RF LLC facility or service center. Any opening or disassembling of any part of the system immediately voids the warranty of the device.

Warranty Overview

Midwest RF LLC (**MIDWEST**) warrants to the original purchaser of an MEP-90 Hair Growth Stimulation System that, exclusive of expendable part, accessories, and safety glasses, such system shall be free from defects in material and workmanship under normal use and service for a period of one year from the date of purchase.

Midwest RF LLC (**MIDWEST**) warrants to the original purchaser of a MEP-90 Hair Growth Stimulation System, that the laser diodes shall be free from defects in material and workmanship under normal use and service for a period of 180 days from date of installation.

This Warranty does not apply to MEP-90 Hair Growth Stimulation System and/or laser diodes that have been altered, subjected to misuse, negligence, unauthorized repair, or accident, operated in any manners other than those in accordance with authorized instructions, or have had the serial number altered, effaced, or removed.

This Warranty represents the exclusive obligation of **MIDWEST** and the exclusive remedy of the purchaser regarding defects in a MEP-90 Hair Growth Stimulation System and/or its laser diodes.

This Warranty is in lieu of all other expressed or implied warranties, including the warranty of merchantability or fitness for a particular purpose, which warrants are disclaimed.

**NO PERSON OR REPRESENTATIVE IS AUTHORIZED TO MODIFY,
IN ANY MANNER, MIDWEST'S OBLIGATION DESCRIBED HEREIN.**

Screening Checklist for Traditional/Abbreviated Premarket Notification [510(k)] Submissions

based on

Guidance for Industry and FDA Staff

Format for Traditional and Abbreviated 510(k)s

<http://www.fda.gov/cdrh/ode/guidance/1567.html>

Title	Related Information	Present	Inadequate	N/A
MDUFMA Cover Sheet	Medical Device User Fee Cover Sheet www.fda.gov/oc/mdufma/coversheet.html	Page 4		
CDRH Premarket Review Submission Cover Sheet	CDRH Premarket Review Submission Cover Sheet www.fda.gov/opacom/morechoices/fdaforms/FDA-3514.pdf	Pages 5-9		
510(k) Cover Letter	Appendix A of "Guidance for Industry and FDA Staff Format for Traditional and Abbreviated 510(k)s" updated November 17, 2005	Page 1		
Indications for Use Statement	Device Advice "Content of a 510(k)" Section D www.fda.gov/cdrh/devadvice/314312.html#link_6	Page 10		
510(k) Summary or 510(k) Statement	Device Advice "Content of a 510(k)" Section E www.fda.gov/cdrh/devadvice/314312.html#link_7	Pages 11-14		
Truthful and Accuracy Statement	Device Advice "Content of a 510(k)" Section G www.fda.gov/cdrh/devadvice/314312.html#link_9	Page 3		
Class III Summary and Certification	Class III Summary and Certification Form www.fda.gov/cdrh/manual/stmnciii.html			✓
Financial Certification or Disclosure Statement	FORM FDA 3454, Certification: Financial Interests and Arrangements of Clinical Investigators www.fda.gov/opacom/morechoices/fdaforms/FDA-3454.pdf FORM FDA 3455, Disclosure: Financial Interests and Arrangements of Clinical Investigators www.fda.gov/opacom/morechoices/fdaforms/FDA-3455.pdf Financial Disclosure by Clinical Investigators www.fda.gov/oc/guidance/financialdis.html	Page 16 Page 17		✓
Declarations of Conformity and Summary Reports (Abbreviated 510(k)s)	Use of Standards in Substantial Equivalence Determinations www.fda.gov/cdrh/ode/guidance/1131.html FDA Standards program www.fda.gov/cdrh/stdsprog.html Declaration of conformity www.fda.gov/cdrh/devadvice/3145.html#link_9 Required Elements for Declaration of Conformity to Recognized Standard www.fda.gov/cdrh/ode/reqrecstand.html			✓ ✓ ✓ ✓ ✓
Executive Summary	See section 10 in Chapter II of "Guidance for Industry and FDA Staff Format for Traditional and Abbreviated 510(k)s" updated November 17, 2005			✓

Title	Related Information	Present	Inadequate	N/A
Device Description	See section 11 in Chapter II of "Guidance for Industry and FDA Staff Format for Traditional and Abbreviated 510(k)s" updated November 17, 2005	Pages 25-31 Pages 79-102		
Substantial Equivalence Discussion	Guidance on the CDRH Premarket Notification Review Program 6/30/86 (K86-3), www.fda.gov/cdrh/k863.html	Pages 36-37		
Proposed Labeling	Device Advice " Content of a 510(k)" Section H www.fda.gov/cdrh/devadvice/314312.html#link_10	Pages 32-35		
Sterilization/Shelf Life	Updated 510(k) Sterility Review Guidance (K90-1) www.fda.gov/cdrh/ode/guidance/361.html For reuse of single use devices, see Guidance for Industry and FDA Staff -- Medical Device User Fee and Modernization Act of 2002 Validation Data in Premarket Notification Submissions (510(k)s) for Reprocessed Single-Use Medical Devices www.fda.gov/cdrh/ode/guidance/1216.html			✓
Biocompatibility	FDA Blue Book Memo, G95-1, Use of International Standard ISO-10993, "Biological Evaluation of Medical Devices Part 1: Evaluation and Testing" www.fda.gov/cdrh/g951.html	Page 37.10		
Software	Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices www.fda.gov/cdrh/ode/software.html	Pages 52-78		
Electromagnetic Compatibility/Electrical Safety	CDRH Medical Device Electromagnetic Compatibility Program www.fda.gov/cdrh/emc See also IEC 60601-1- 2 Medical Electrical Equipment -- Part 1: General Requirements for Safety; Electromagnetic Compatibility -- Requirements and Tests (Second Edition, 2001)	Pages 32-42		
Performance Testing – Bench	See section 18 in Chapter II of "Guidance for Industry and FDA Staff Format for Traditional and Abbreviated 510(k)s" updated November 17, 2005	Pages 38-42		
Performance Testing – Animal	See section 19 in Chapter II of "Guidance for Industry and FDA Staff Format for Traditional and Abbreviated 510(k)s" updated November 17, 2005			✓
Performance Testing – Clinical	See section 20 in Chapter II of "Guidance for Industry and FDA Staff Format for Traditional and Abbreviated 510(k)s" updated November 17, 2005 Certification/Disclosure Forms: Financial Interests and Arrangements of Clinical Investigators www.fda.gov/opacom/morechoices/fdaforms/FDA-3454.pdf www.fda.gov/opacom/morechoices/fdaforms/FDA-3455.pdf	Pages 15-24		
Kit Certification	Device Advice http://www.fda.gov/cdrh/devadvice/314c.html			✓

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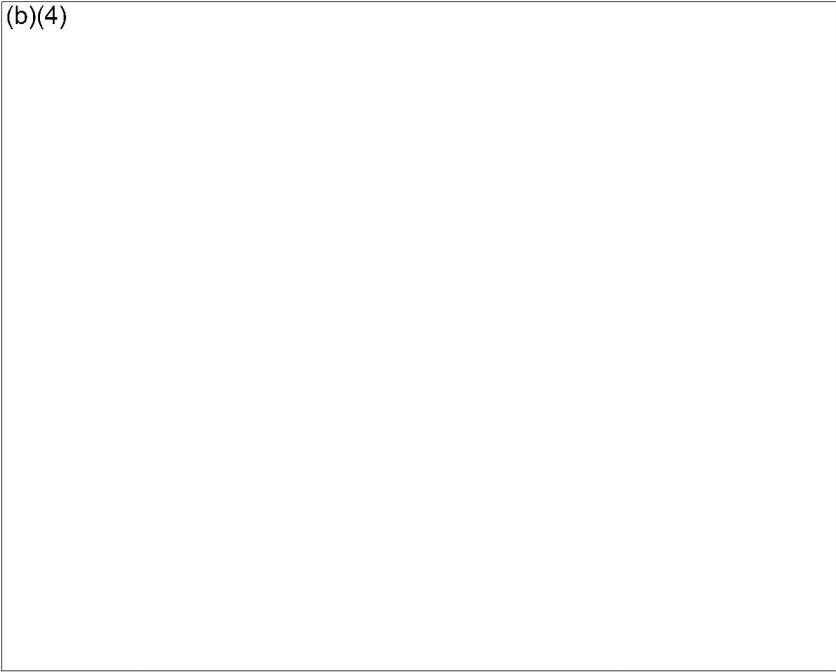


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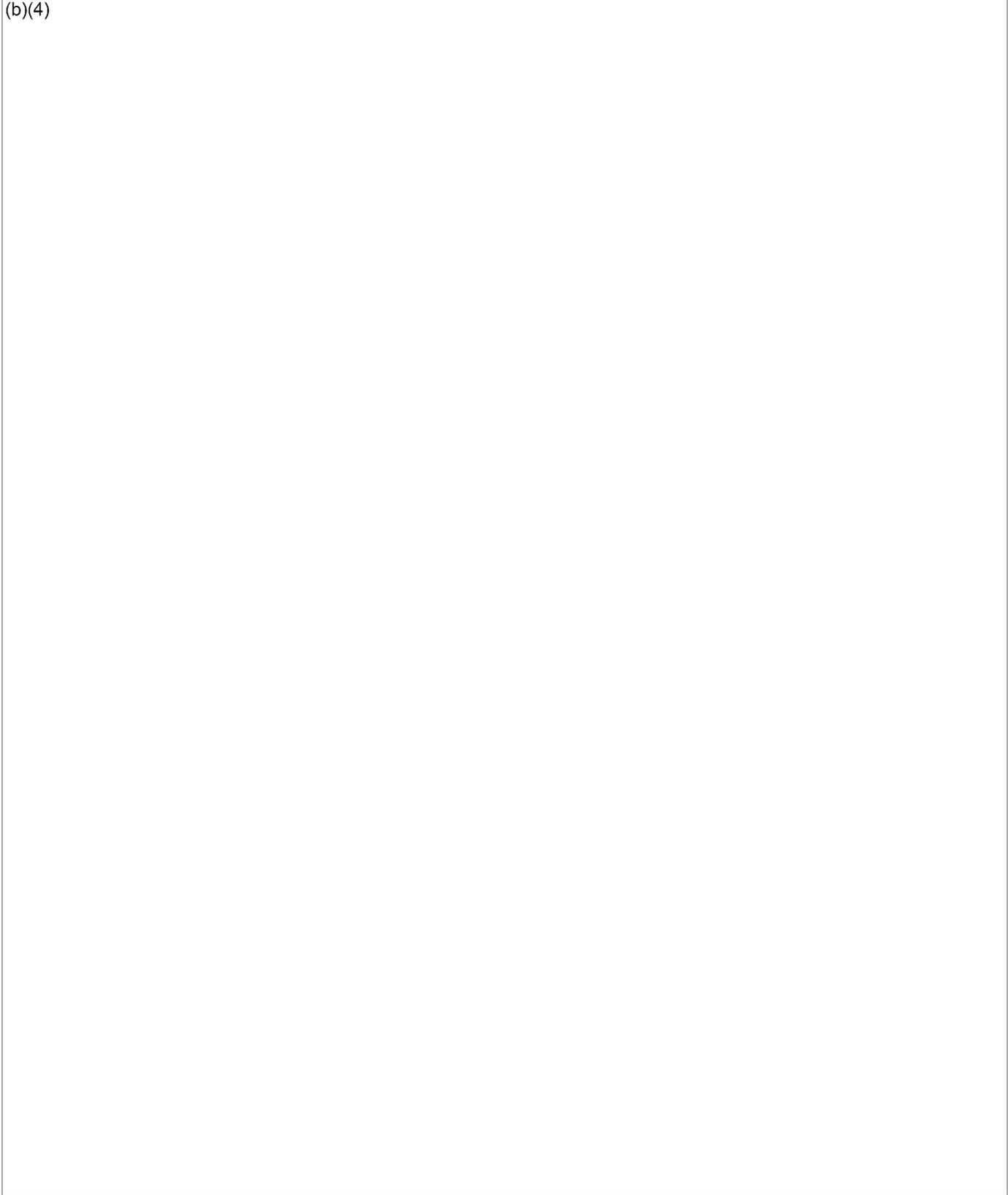
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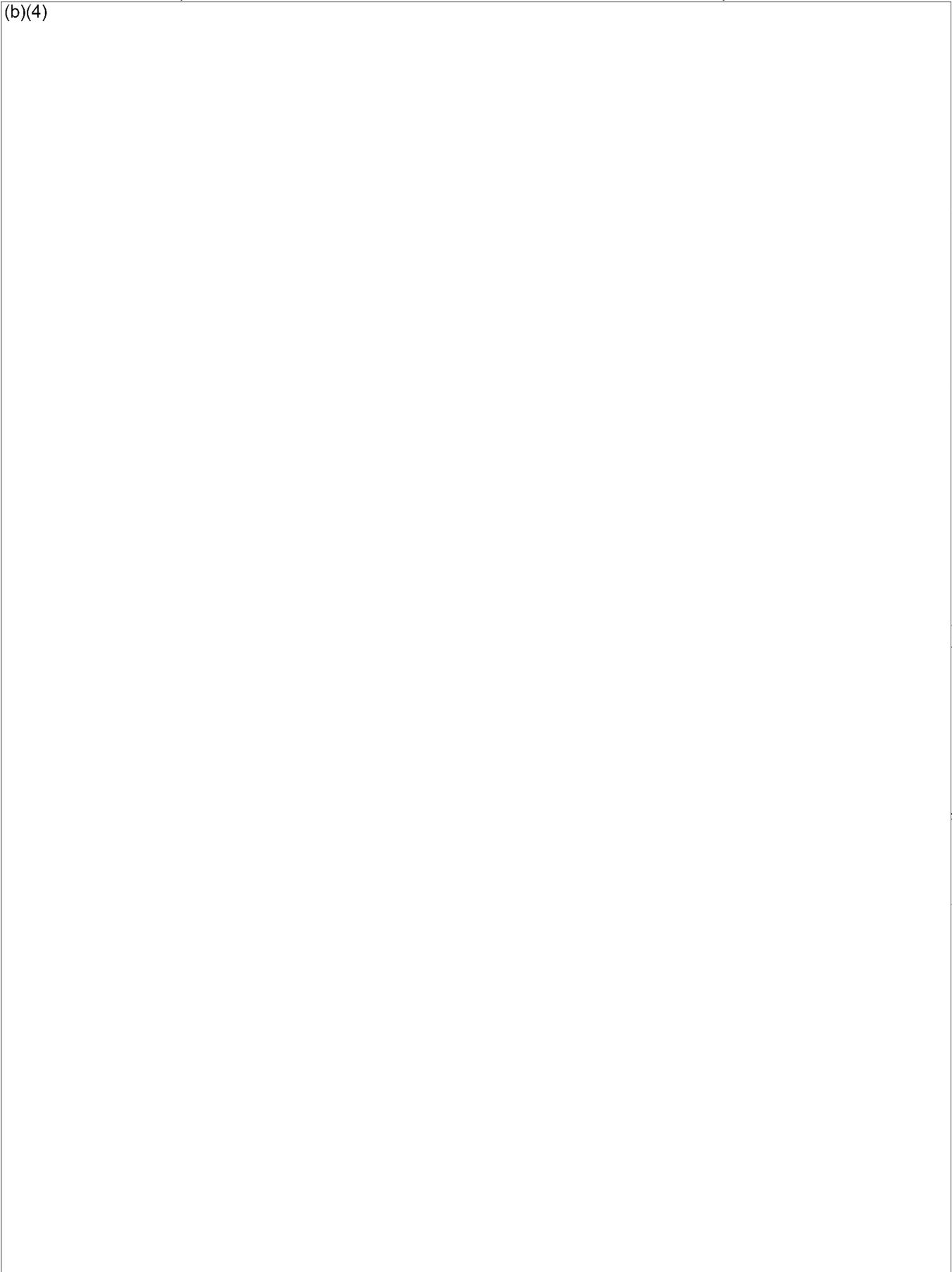
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¹ Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices; May 11, 2005

² Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices; May 11, 2005; P.6-7

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474

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475



MEP-90 Operating Software Test Report

Treatment Time	
20 Minutes	<input type="button" value="Start"/>
Time Remaining	<input type="button" value="Pause"/>
100%	<input type="button" value="Stop"/>
Level On Time	<input type="button" value="Diagnose"/>
60 SEC.	<input type="button" value="Diagnose"/>
Diagnose	<input type="button" value="Diagnose"/>

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Page 2 of 7 Pages

Test Engineer Initials: _____

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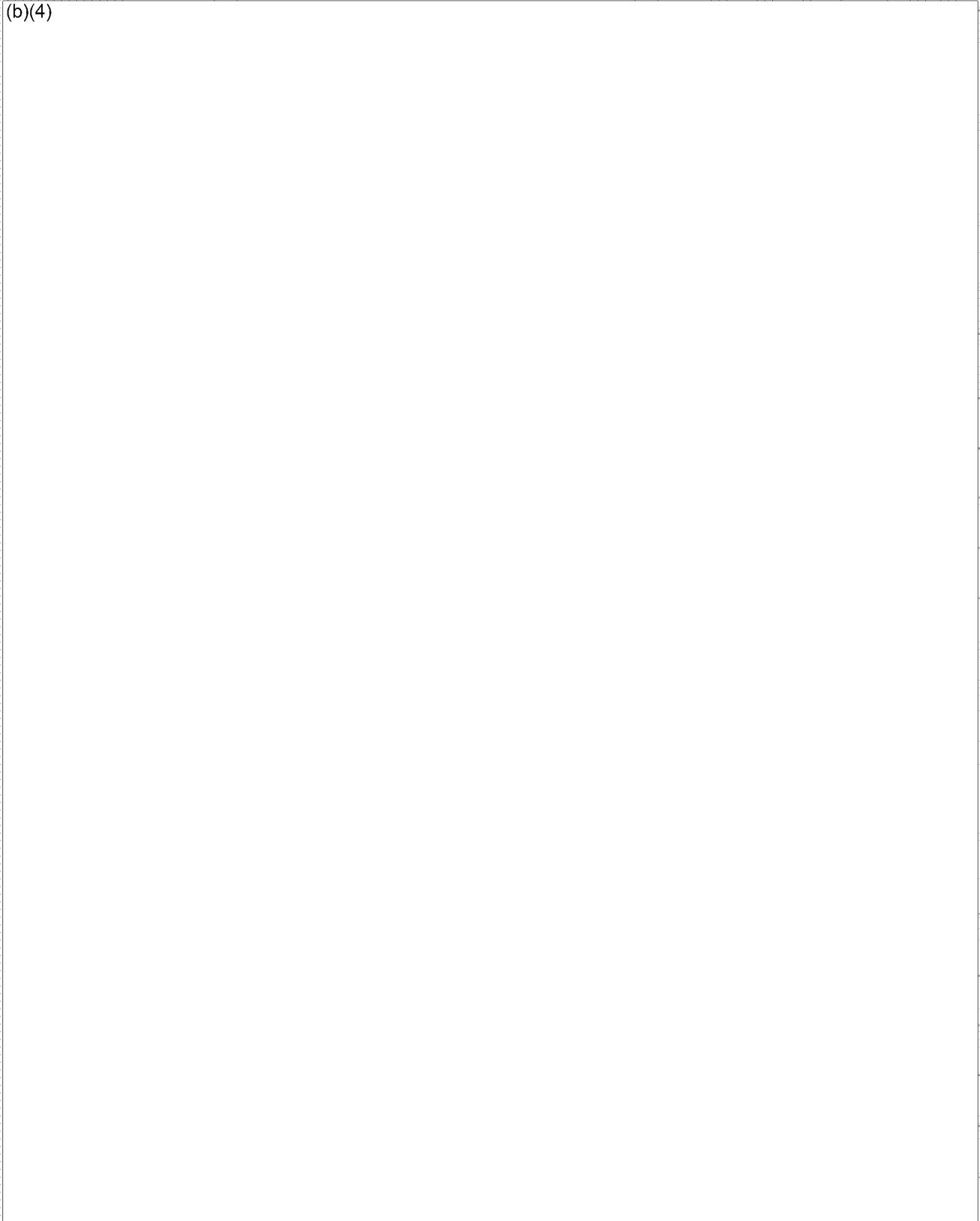
Page 7 of 7 Pages

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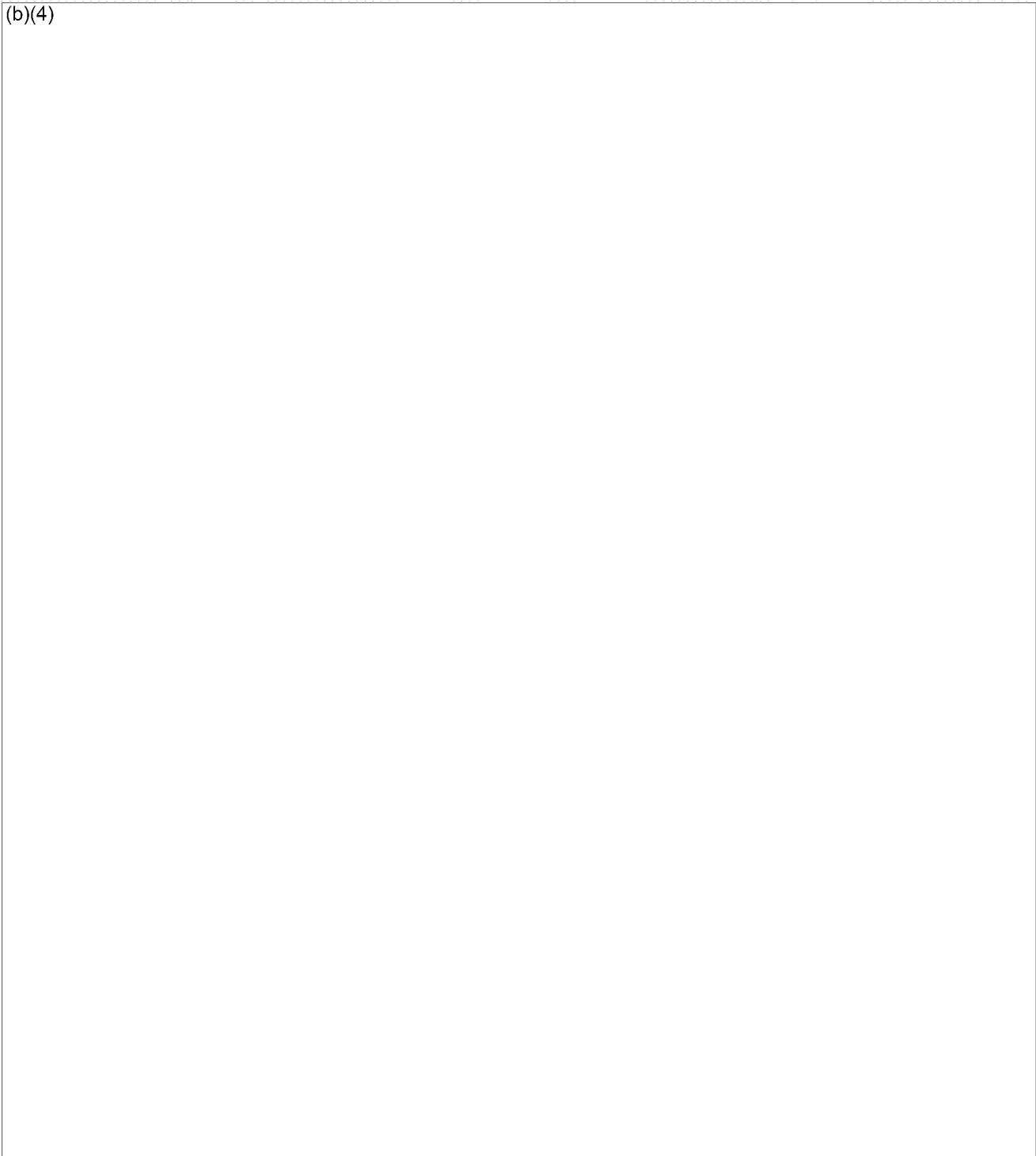
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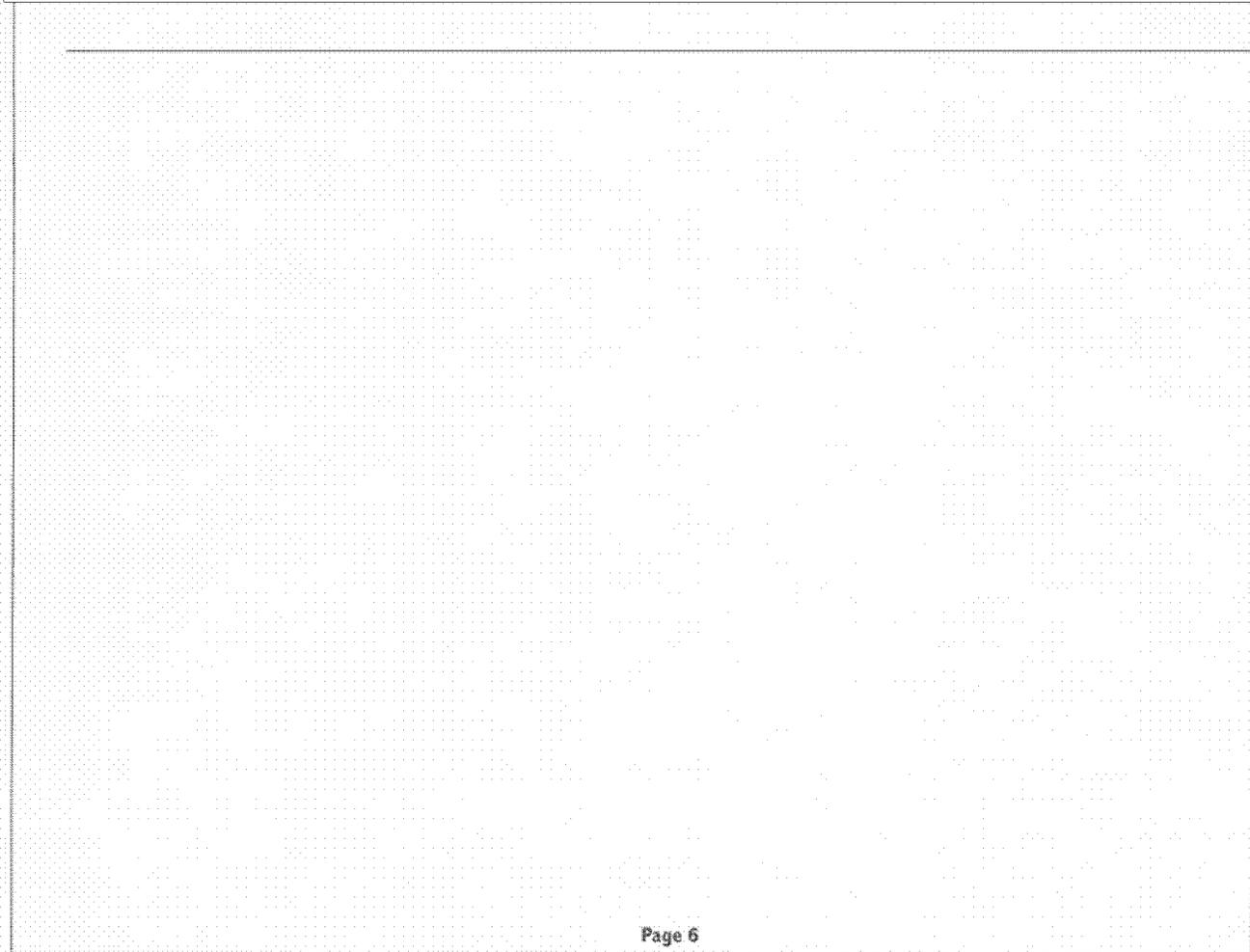
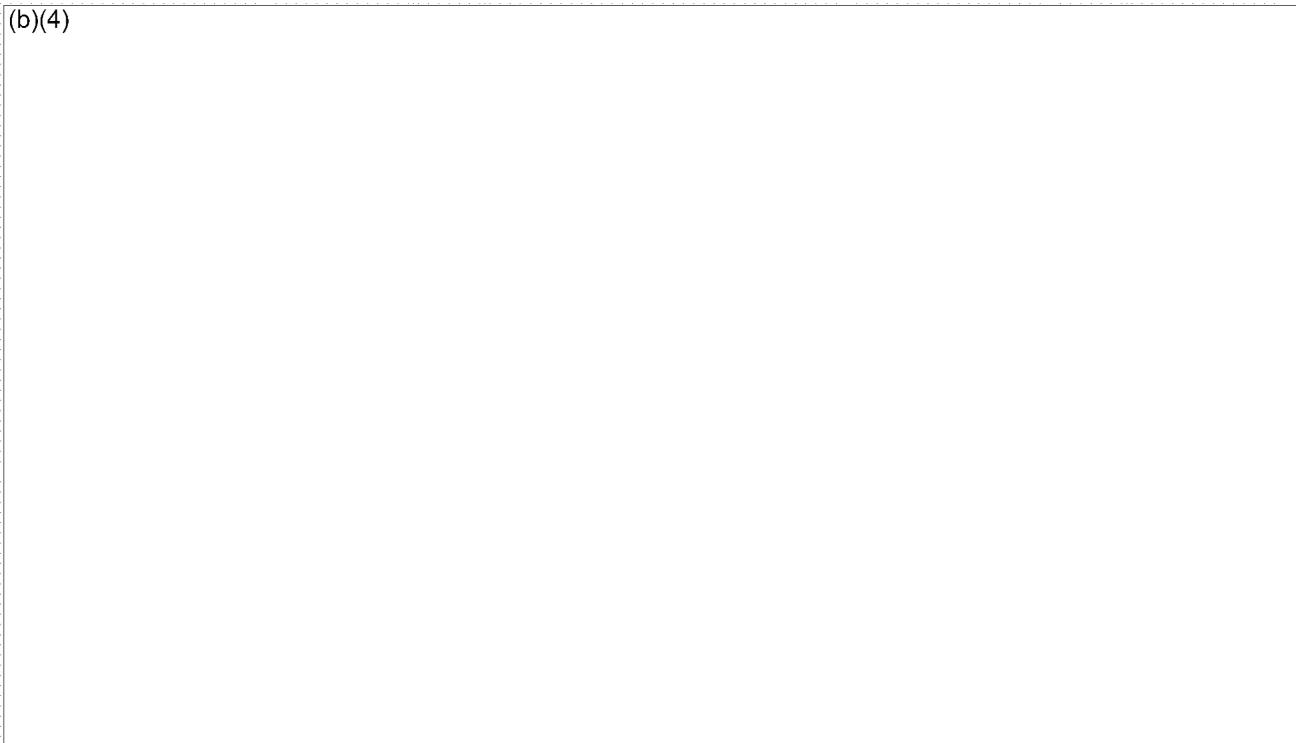
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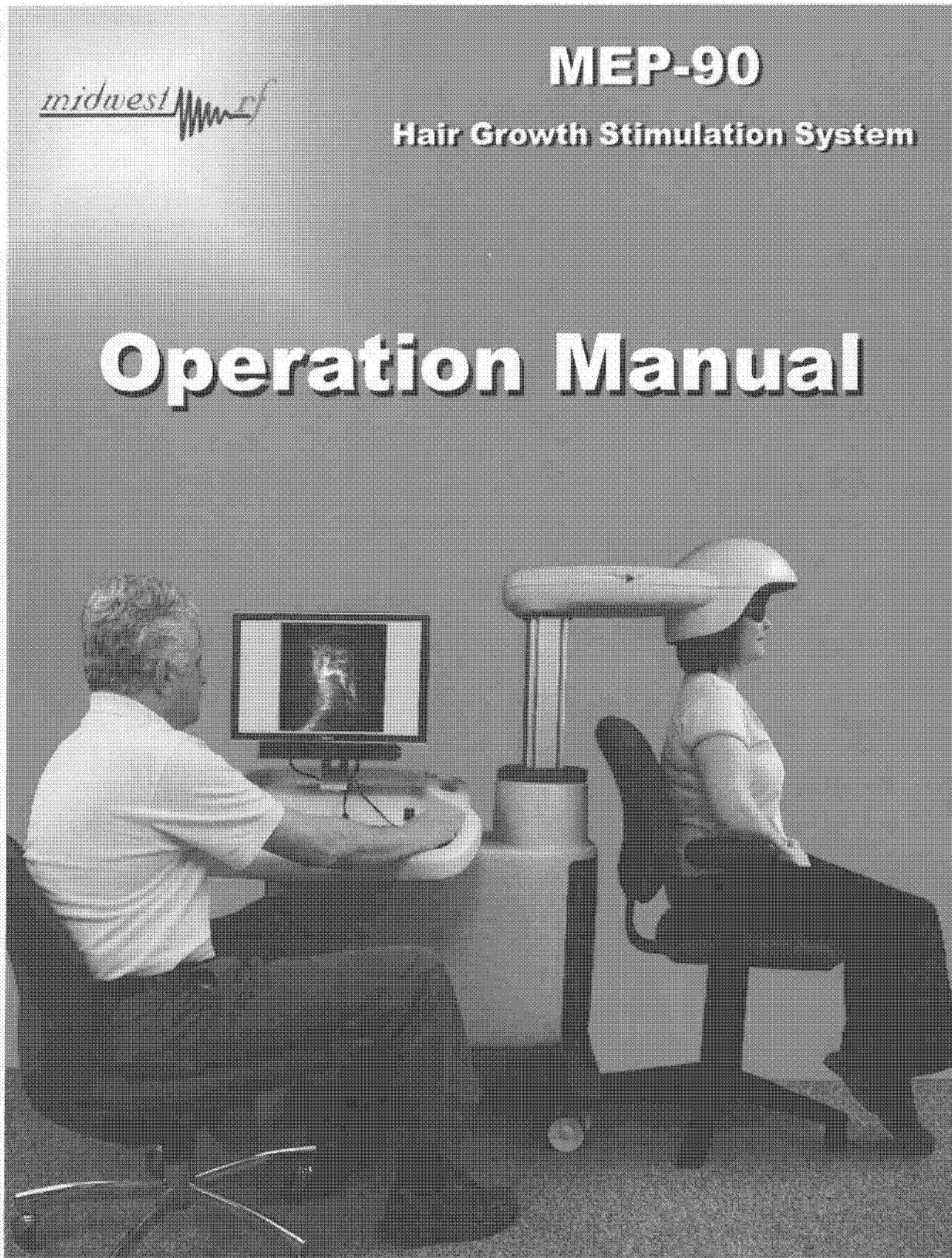
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MEP-90

Hair Growth Stimulation System

Operation Manual





from the desk of Helmut Keidl

I want to thank you for your purchase of the MEP-90 Hair Growth Stimulation System and welcome you to the family of Midwest RF users.

We at Midwest RF take great pride in providing only superior designed products whose performance is unequalled.

The MEP-90 represents years of engineering, production, and clinical due diligence. I believe strongly in our ability to support your clinical needs and to provide the finest in customer service.

If you are ever in our area, I welcome you to stop by for a visit and tour of our facilities.

Again, thank you for your confidence in Midwest RF.

Helmut

Customer Service

Midwest RF, LLC

1050 Walnut Ridge Drive

Hartland, WI 53029

Phone: (262) 367-8254

fax: (262) 367-8244

www.midwestcomposite.com

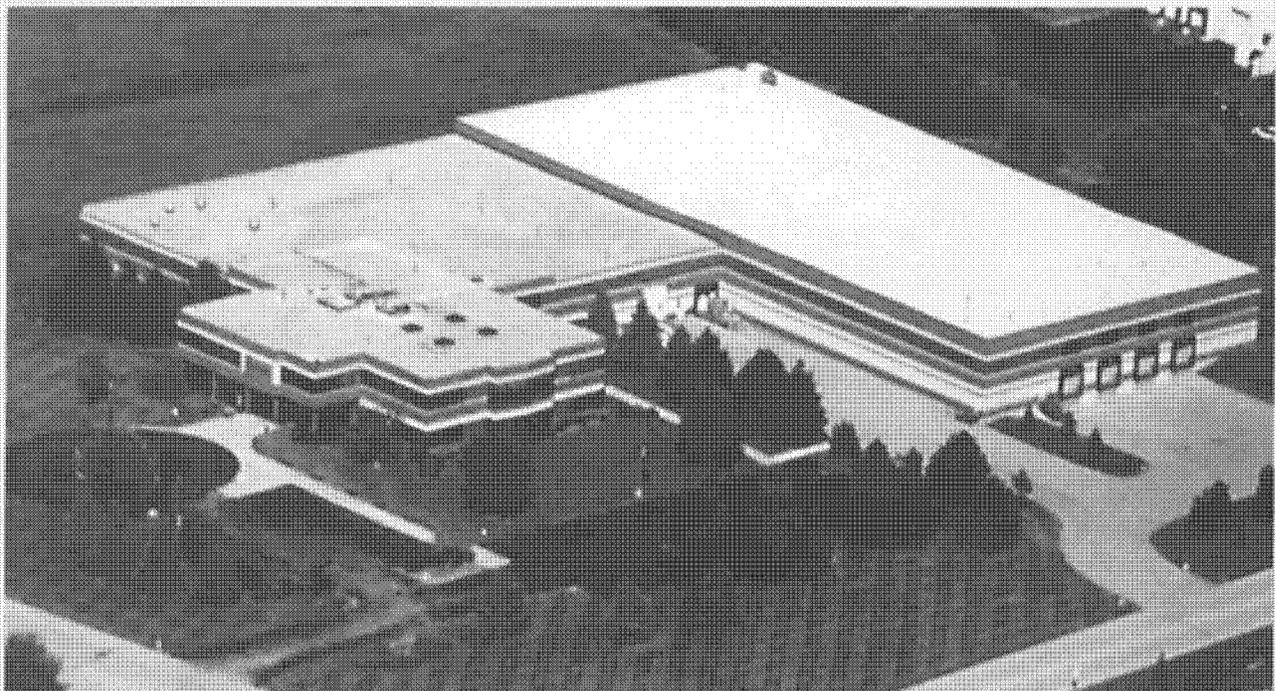


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Introduction

The Science

The *electromagnetic spectrum* is the name used for discussing types of radiation. Radiation is simply any energy that travels and how it spreads out as it travels. Two examples are the light from a lamp and the radio waves that you listen to. Other examples are microwaves, infrared, ultraviolet light, X-rays, and gamma rays. The complete electromagnetic spectrum, with its various types of energy, is shown in the illustration to the right (Figure 1).

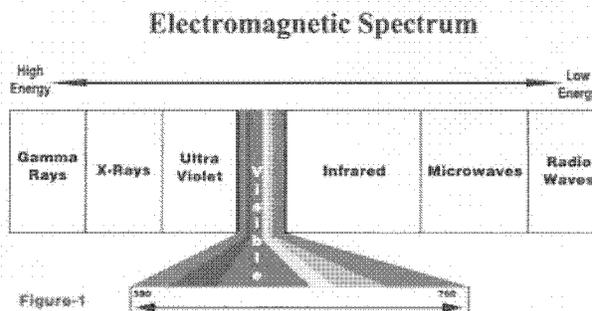


Figure-1

Our eyes are sensitive to light which lies in a very small region of the electromagnetic spectrum labeled "visible light." As shown in the illustration, this "visible light" corresponds to a wavelength range of 380 - 760 nanometers and a color range of violet through red. The human eye is not capable of "seeing" radiation with wavelengths outside the visible spectrum. Immediately below that range is the ultraviolet spectrum range and above is the infrared spectrum range.

All electromagnetic radiation, regardless of its type, has an effect on the cells of the human body. The effects can range from damaging to beneficial, depending on the type of energy that is applied. Since the early 1980's, there has been extensive clinical research conducted on the body's beneficial reaction to the energy emitted from both visible and infrared light.

This research established that the effect is relative to the specific wavelength (λ) of the light applied. Wavelength is the distance between identical points in the adjacent cycles of a waveform signal propagated in space, as shown in the illustration (Figure 2). Measurement of a wavelength is performed by using a variety of metric units, the most common is the nanometer (nm), which equals "one billionth of a meter," or 1/25,400,000 of an inch.

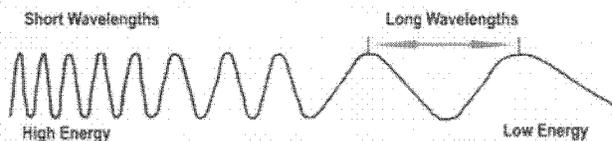


Figure 2

The clinical research studies also indicated the body's reaction to powerful light from two light sources:

LLLT (low level laser therapy • L.E.D. (light emitting diode)

It has been shown that cells grown in cultures and exposed to this light grow 150 to 200 percent faster than ground control cultures not stimulated by the light. In addition, there have been numerous other clinical papers published and presented worldwide, on the effectiveness of light stimulation on the human body as it relates to:

- | | |
|-------------------------|----------------------|
| Nerve Regeneration | Cellular Oxygenation |
| Cellular Detoxification | Wound Healing |

As it relates to lasers, this process is referred to as photobiomodulation, low level laser therapy (LLLT), cold laser therapy, and/or laser biostimulation.

The MEP-90 Theory of Operation

We know that hair growth has a three-phased cycle:

anagen - the growing phase of hair, usually lasting between two and six years

catagen - the intermittent stage between the growing (anagen) and resting (telogen) phases of the hair's growth cycle

telogen - the loss of hair during the resting phase or natural hair loss

Each phase has several morphological and histological distinguishable sub-phases. Prior to the start of cycling is a phase of follicular morphogenesis (formation of the follicle). There is also a shedding phase, or exogen, that is independent of anagen and telogen which is where several hairs might arise from a single follicle.

At the base of the follicle is a large structure that is called the papilla. The papilla is made up mainly of connective tissue and a capillary loop. Cell division in the papilla is either rare or non-existent.

Around the papilla is the hair matrix, which is a collection of epithelial cells often interspersed with melanocytes. Cell division in the hair matrix is responsible for the cells that will form the major structures of the hair fiber and the inner root sheath. The hair matrix epithelium is one of the fastest growing cell populations in the human body. That is why some forms of chemotherapy that kill dividing cells, or radiotherapy, may lead to temporary hair loss, due to their effect on this rapidly dividing cell population.

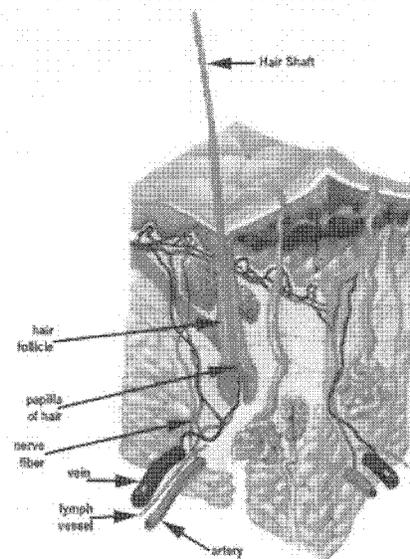


Figure 2

The papilla is usually ovoid or pear shaped with the matrix wrapped completely around it, except for a short stalk-like connection to the surrounding connective tissue that provides access for the capillary. Stem cells are located at the junction of the arrector and the follicle, and are principally responsible for the ongoing hair production during the process known as the anagen stage.

The MEP-90 uses 82 lasers with diffused beams and a wavelength of 650nm each. The vast majority of manufacturers set their wavelength tolerances at $\pm 5\%$ or ± 5 nanometers. This translates to their actual wavelengths varying as much as 617nm to 683nm. However the MEP-90 utilizes measured wavelengths of 650nm to 650.8nm.

This allows maximum coverage of the scalp, thus simultaneously stimulating all of the components cells of the hairs' anatomy. We use a specific power output, with each beam measured. Our clinical research verified that 650nm, with our specific power output, is the ideal combination, because it demonstrated the maximum positive effect, complete coverage, and total safety to both the patient and the operator.

Clinical Study Overview

Midwest RF sponsored an experimental type clinical and data acquisition study between the period August 2008 and May 2009. Its objective was to determine the clinical, technological, and regulatory efficacy of therapeutic treatments using the MEP-90 Hair Growth Stimulation System, on medically diagnosed female subjects with androgenic (androgenetic) alopecia.

The Study was conducted under the direct supervision of a licensed physician, with strict adherence to all provisions of Title 21, U.S.C.; Title 21, Code of Federal Regulations; Title 45, U.S.C.; and Title 45, Code of Federal Regulations. The type, methodology, protocol, and execution of the Study were pre-approved and monitored by a federally sanctioned Institutional Review Board (IRB).

The results of the Study support the MEP-90's Indications For Use which are:

Adjunctive use for the treatment of androgenic (androgenetic) alopecia in females and is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenic (androgenetic) alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

User Responsibility

NOTICE: IT IS MANDATORY THAT THE USER READ AND BECOME FAMILIAR WITH THE ENTIRE CONTENTS OF THIS OPERATION MANUAL FOR THE PROPER AND SAFE UTILIZATION OF THE MEP-90 HAIR GROWTH STIMULATION SYSTEM AND ALL ITS ACCESSORIES. THERE IS NO A SUBSTITUTION FOR READING AND UNDERSTANDING THIS MANUAL IN ITS ENTIRETY.

This product will perform in conformity with the description thereof contained in this Operation Manual and accompanying labels and/or inserts, when assembled, operated, maintained, and repaired in accordance with the instructions provided.

This product must be checked for excessive wear and/or damage periodically. A defective product should not be used. Parts that are broken, missing, plainly worn, distorted, or contaminated must be replaced immediately. Should such repair or replacement become necessary, Midwest RF, LLC (MRF) strongly recommends that a telephone call or written request be made to Midwest RF's Customer Service Department at:

**1050 Walnut Ridge Drive
Hartland, WI 53029**

Phone: (262) 367-8254 fax: (262) 367-8244

Email: mep90service@midwestcomposite.com

This product and any of its parts should not be repaired other than in accordance with written instructions provided by Midwest RF, LLC, nor altered in any way without prior written approval provided by Midwest RF, LLC. The user of the product shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, improper repair, damage, or alteration by anyone other than Midwest RF, LLC's authorized service personnel.

Warranty Registration

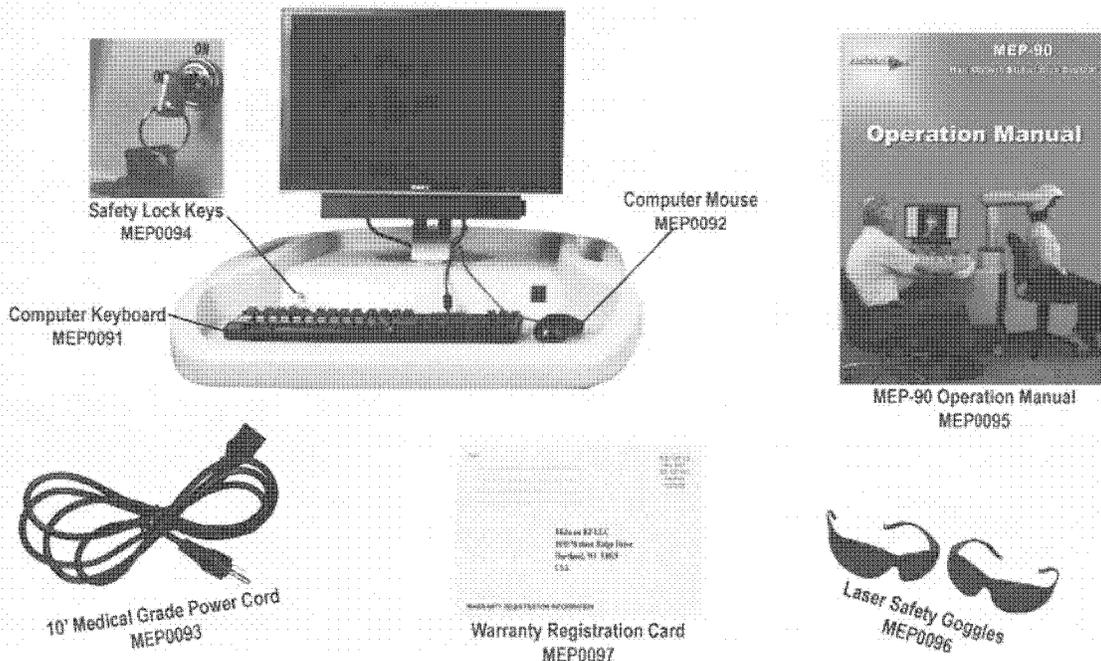
To assist in completing mandatory Food and Drug Administration reporting requirements, please be diligent in completing and returning the Warranty-Registration Card. If the Card is missing, kindly verify that your sales representative has performed this task for you, or request a replacement. You should verify that the serial number on the card is the same as that on the serial number plate located on the back of the system mainframe. Failure to file this registration, within 45 days of delivery of the MEP-90 Hair Growth Stimulation System, could result in the voiding of the Warranty.

MEP-90 System Components And Nomenclature

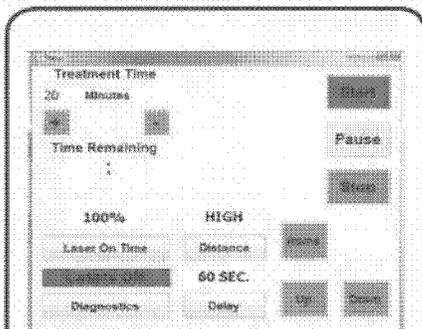
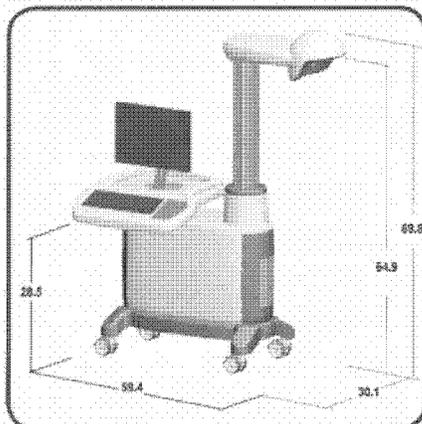
Your MEP-90 Hair Growth Stimulation System has undergone extensive quality control and safety checks prior to shipping. In addition, our technicians have verified that it is in working order and ready to provide you reliable and accurate clinical performance for the foreseeable future.

The complete MEP-90 Hair Growth Stimulation System consists of ten items consisting of eight (8) different components. We ask that you verify your receipt of all items at installation. In the unlikely event that any service or replacement issues arise, we ask that you refer to the specific component and its corresponding Part Number.

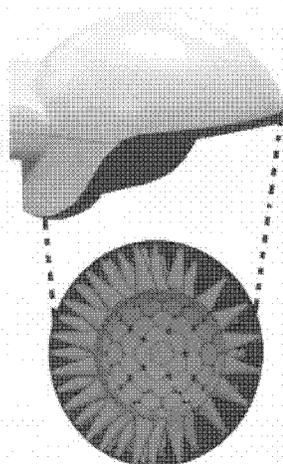
Qty	Description	Part#
1ea	MEP-90 Hair Growth Stimulation System Console	MEP0090
1ea	Computer Keyboard	MEP0091
1ea	Computer Mouse	MEP0092
1ea	10' Medical Grade Power Cord.....	MEP0093
2ea	MEP-90 Safety Lock Keys.....	MEP0094
1ea	MEP-90 Operation Manual	MEP0095
2ea	Operator and Patient Laser Safety Goggles.....	MEP0096
1ea	MEP-90 Warranty Registration Card.....	MEP0097



MEP-90 System Specifications



On Screen Operation Menu



Laser Coverage Area

Operating Specifications

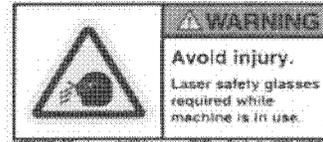
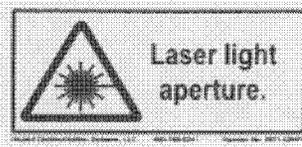
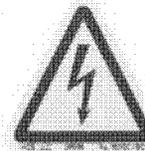
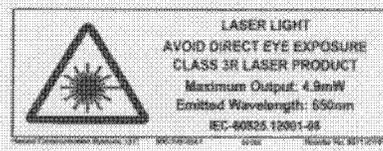
- Wavelength(λ): 650nm (+ \pm 1% Measured)
- Voltage: 3vDC
- Diodes: 82 with maximum power output of $\leq 5\text{mwcm}^2$ measured
- Type: Di-banded focused
- Color: Red
- Beam: Non-focused/diffuse
- Safety:
 - Complies with FDA regulations for Class IIIr laser
 - Key lock necessary for operation
 - Data entry for safety glasses necessary to activate
 - Beam interrupt necessary for operation
 - No scattering of beam outside of hood assembly
 - Chassis to ground 0vA during operation
- Voltage: 110vAC converted to 24v DC
- Safety: Chassis to ground risk $\leq 100\text{mA}$
- Other:
 - FCC Standard - 47CFR Part 15B
 - IEC 60601-1 • IEC 60825-1
 - 21CFR, Subchapter J-Part 1010
 - All electrical components UL[®] approved
 - All applicable components are Medical grade
- Weight: 72.0 lbs. (32.66kg)
- Dimensions:
 - Height with tower fully extended: 69.8 inches (172.29cm)
 - Power Cord: 120" (304.8cm)
- Temperature:
 - Operating: 50°F to 104°F (10°C to 40°C)
 - Storage: -4°F to 122°F (-20°C to 50°C)
 - Note: If system stored $\leq 40^\circ\text{F}$ (4°C) allow to warm up $\geq 50^\circ\text{F}$ (10°C)
- Humidity: 15% to 90% noncondensing
- Altitude: Exceeds MMI Standard of -500' to 5000' barometrical pressure

MEP-90 System Set-Up

Labeling

At Midwest RF, user and patient safety are foremost in the minds of our engineers. The MEP-90 is a safe and effective medical device, having withstood rigorous testing under many different and abnormal conditions.

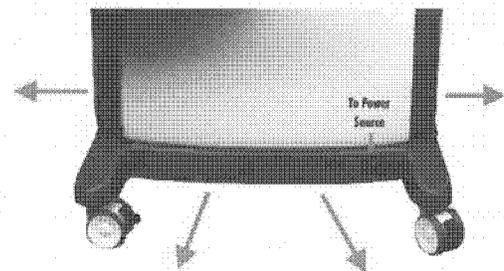
You will notice there are four (4) different types of safety labels on the exterior of the system. We recommend that you learn and become familiar with each label, as they serve the purpose of reminding you that the MEP-90 should be only operated in accordance with the procedures called for in this manual. These labels are there for laser and electrical safety purposes and verify the MEP-90's compliance to specific United States' regulatory (FDA, FCC), International Standards Organization (ISO), and other specific regulatory standards.

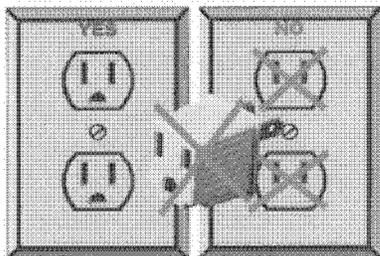


Do not remove any of these labels, as their visibility and locations are required by law.

System Placement And Power Source

Your clinical preparation and set-up of the MEP-90 is quite simple. Make sure there is at least six inches of space between the side access doors of the Control Base, and that there are no heating or air conditioning vents blowing directly on the system. Since the system is controlled by a computer, we strongly recommend the MEP-90 be plugged into a dedicated electrical line that is surge protected.





When plugging the MEP-90 into an electrical outlet, make sure it is an 110v-AC line with a three-pronged outlet and a true ground.

IMPORTANT: Never use an two-pronged adapter.

Treatment Room Set-Up Considerations

We recognize the subjectivity that goes into the decor of a clinic. Lighting, color scheme, and furniture selection are the primary considerations that you must decide. However, we have several recommendations that will enhance safety, system performance, and patient comfort:

Room Size – To insure adequate ventilation of the system, the treatment room should be at least 7' (2.1 meters) long by 6' (1.8 meters) wide. If you have more than one MEP-90 in the room, allow a 5' x 5' area for each system. The room needs to be ventilated by either forced air or with an outside window.

The ambient room temperature should range between 65°F (18°C) to no higher than 80°F (27°C).

Furniture – Your patient will be required to be seated, and remain relatively still, for at least 15-20 minutes. The treatment chair needs to be comfortable. Our reserach indicate the patient is more comfortable if some form of a footrest is available.

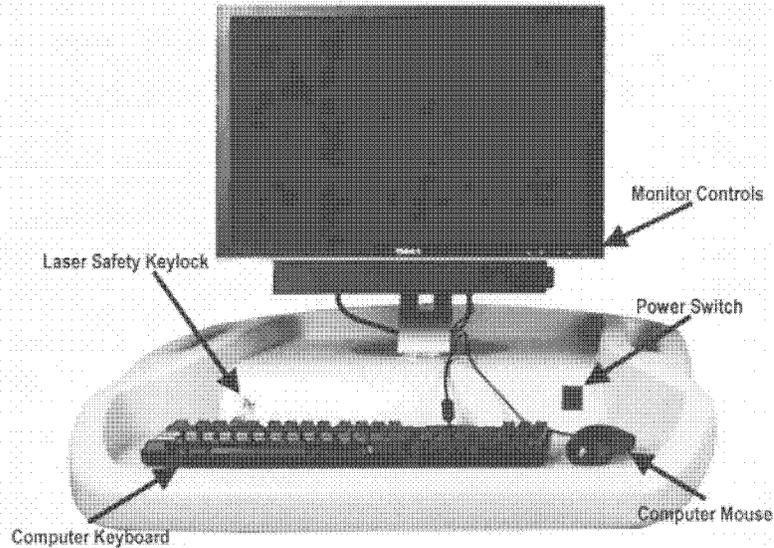
There are two factors that are strongly recommended to be incorporated into your treatment chair selection;

- No headrest or neck support above the clavicle
- Chair should be stationary and not on rollers or casters

MEP-90 System Operation

System Start-Up

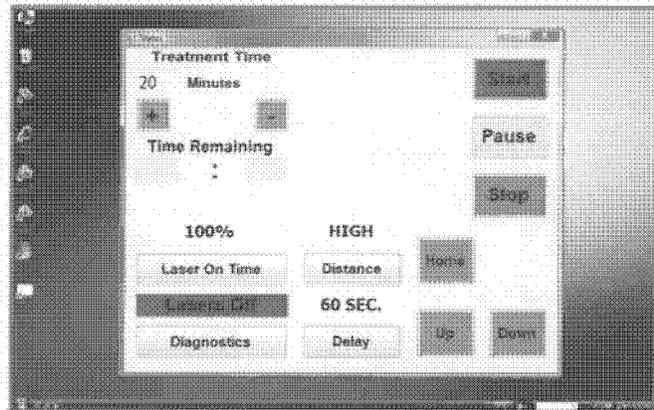
You should first familiarize yourself with all the control functions, and follow the Start-Up sequence as specified when initializing the MEP-90.



STEP 1 - Making sure the Power Switch is in the **OFF** position, and the Laser Safety Keylock is in the **OFF** position (horizontal), insert the female end of the Power Cord into the receptacle on the Mobile Base Assembly. Plug the male end of the Power Cord into an approved receptacle.

Insert the key into the Safety Keylock Assembly and turn to the **ON** position (vertical). Depress the Power Switch to the **ON** position.

STEP 2 - The computer takes approximately 30 seconds to boot up and perform System diagnostics. Once completed, the following **DEFAULT** screen will appear:

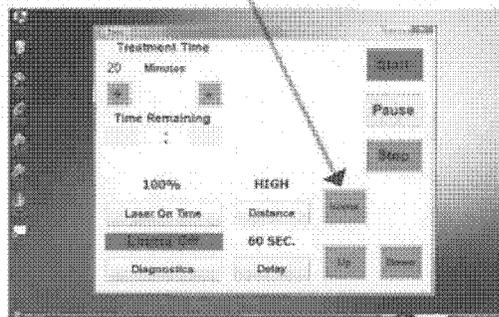


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If you forget to turn the Laser Safety Key to the **ON** position, the following reminder will appear over the Default Screen. Simply turn the key to the **ON** position and it will disappear.



Using the Mouse arrow, "double-click on the **HOME** button.



This calibrates the Adjustable Column Assembly, using the built-in optical encoders in the column. This calibration takes approximately 10-15 seconds.

Note: This calibration must be performed each time the System is powered **ON**.

Your MEP-90 Hair Growth Stimulation System is now fully operational.

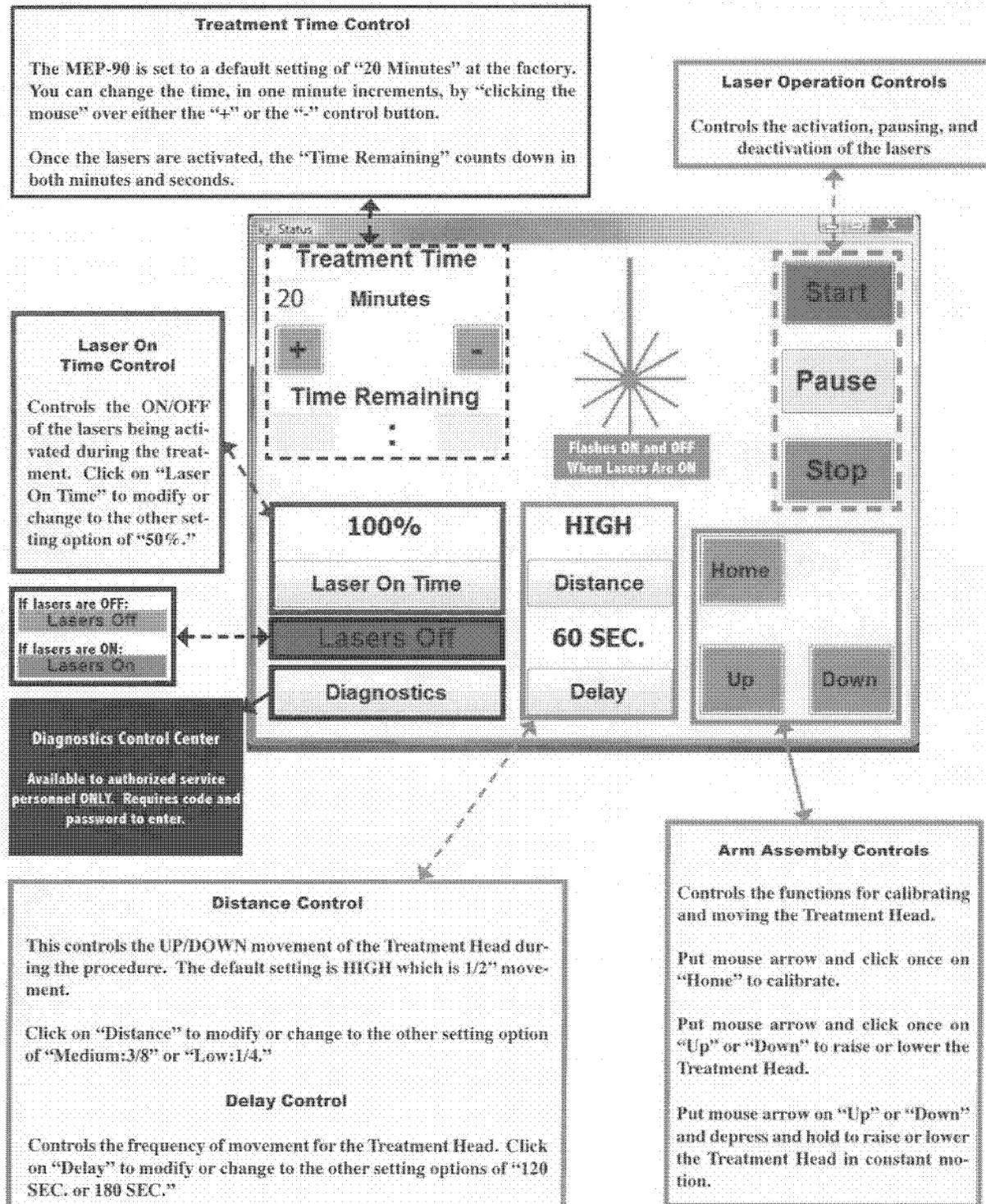
Microprocessor Control Panel

The MEP-90 Hair Growth Stimulation System is controlled by Microsoft Windows XP® Operating System. It features "mouse activated" displays for all operator functions and has numerous built in safety and diagnostic capabilities. It is recommended that you "double click" once for any desired function, then allow the System to respond. Multiple "double clicks," without allowing adequate time for response, may cause the computer to "freeze-up" and/or "shut down."

This is a safety feature designed into the MEP-90. Should the MEP-90 "freeze-up" because of this, simply power **OFF** the System, wait five (5) seconds, then power **ON** the System.

Do not forget to HOME the System again.

MEP-90 Default Screen Controls And Display Functions



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MEP-90 Operational Safety Features

Prior to using the system, you should be aware of the safety features of the MEP-90 Hair Growth Stimulation System. Part of the FDA approval process is the review of safety features that are designed into and part of the system. The MEP-90's software validation, final test, component specification and testing, and labeling are part of the manufacturing controlled safety features.

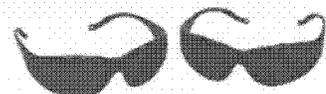
In addition, there are user and patient safety features that were designed into the MEP-90 that are an integral part of its operation:

- **Safety Keylock Assembly** - The lasers will not operate unless the Safety Keylock is turned to the ON position. As described on page 13, a message will also appear on the screen indicating that the "keyswitch is OFF."



- **Default Override Limitations** - Although the user has the option to change the default settings, the maximum variations of custom settings still fall within the published limitations as to the maximum amount of power output which is $\leq 5 \text{mW/cm}^2$.

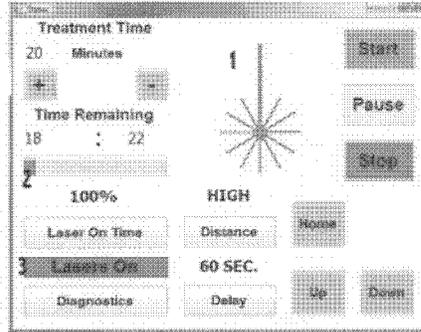
- **Laser Safety Goggles** - The MEP-90 is shipped with two pair of laser safety goggles. Both the operator and the patient should wear these goggles anytime the lasers are to be activated. These are not a form of sunglasses. They are goggles that have special lenses that protect the eyes from the wavelength (λ) of the lasers used by the MEP-90.



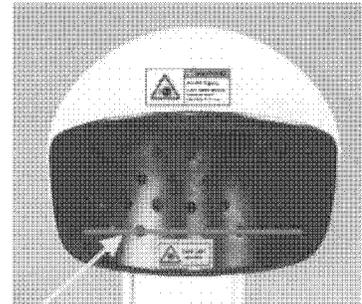
- **Laser Safety Goggles Warning**- After using the mouse to START the laser treatment, the following reminder warning appears on the display screen:



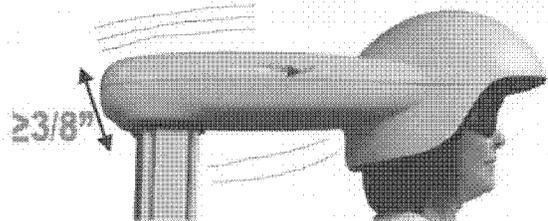
- Lasers On Indicators** - Whenever the lasers are powered on, the Operation Display Screen will display (1) a "flashing" laser symbol, a status bar (2) indicating treatment received, and the laser indicator will change (3) from Lasers Off to Lasers On (see below).



- Thru-Beam Interrupt Shut Off** - When the MEP-90 is generating a treatment, should this beam be NOT BROKEN/INTERRUPTED by the patient's head, the MEP-90 immediately stops the therapy, and shuts off the lasers.



- Hood Tilt Shut Off** - When the MEP-90 is generating a treatment, should the Light Therapy Hood Assembly tilt or tip more than 3/8", the MEP-90 immediately stops the therapy.



- Hood Proximity Switch** - Inside the Treatment Head is a proximity switching circuit that controls the distance between the head and the patients scalp. Anytime the inside of the Treatment Head comes within 1/2" of the patient's scalp, the head will no longer move DOWN.

FDA Approved Indications Of Use

The Food and Drug Administration (FDA) has approved the MEP-90 Hair Growth Stimulation System for the following Indications of Use:

The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

It is the physician's total responsibility to select and/or define a specific treatment protocol, however Midwest RF, LLC provides a clinical protocol that has been proven effective using this modality. The protocol was used to generate the 18-week (36 treatment) clinical efficacy data submitted to the FDA for obtaining 510(k) approval under the provisions of 21U.S.C. The 18-week results obtained were as follows:¹

RESULTS: 82 of 162 subjects examined were accepted based on a medical diagnosis of androgenic alopecia. Those excluded were subjects with other forms of alopecia and/or having other medical issues that generated symptoms mimicking androgenic alopecia. Dropouts, excessive missed treatments, one corrected diagnosis, and one death not related to the Study reduced the final number to 63 after Phase 1 (10 weeks/20 treatments) and 61 after Phase 2 (18 weeks/36 treatments).

After 20 treatments (Phase 1), 92% of the subjects presented an increased hair count of $\geq 10\%$ with 60% having an increase $\geq 30\%$. The analysis indicated that 65% of the subjects experienced a medically significant impact on their existing hair (32% were statistically significant); 98% demonstrated a medically significant impact with their rate of hair loss; and 92% demonstrated a medically significant impact on their hair growth cycle. The subjects supported these results as 67% stated they had noticed positive changes to their hair and 68% stated their rate of hair loss was slower, with an additional 27% stating their rate of loss had stabilized.

After 36 treatments (Phase 2), 97% of the subjects presented an increased hair count of $\geq 20\%$ with 88% demonstrating an increased count of $\geq 30\%$. The initial, 10-week, and 18-week hair counts were plotted with 100% of the subjects presenting an upward historical linear trend of hair growth. Further analysis indicated that at the 18-week level, the treatments had a medically significant impact on 98% of the subjects. The subjects also supported these findings in that 61% indicated their rate of hair loss had further slowed down since the 10-week level. In addition, 78% of the subjects reported they noticed positive changes to their condition; 86% stated the treatments had helped their condition; and 66% stated the area of baldness had reduced in size with the remaining 34% stating the size of their bald spot(s) had stabilized.

¹ Effect of Laser Biostimulation In The Treatment of Androgenic (Androgenetic) Alopecia; Grant F. Koher, DO; April 2009

Contraindications

Under the provisions of 21CFR, Part 812, the MEP-90 is classified as a "non-significant risk" (NSR) medical device. In the referenced Study, use of the MEP-90 was not indicated in cases of suspected androgenic alopecia which included the following patient history(s)/symptoms:

- Active thyroid disorder
- Type I or II Diabetes
- Prescription anticoagulants
- Prescription Gout medications
- Taking excess Vitamin A
- Prescription anti-depressants
- Syphilis
- Blood Iron Disorder

Had any, or have taken, one or more of the following within the previous six (6) months:

- Major surgery
- Chemotherapy
- Minoxidil (Rogaine)
- Finesteride (Propecia)
- Anthralin
- Corticosteroids
- DPCP

Use of the MEP-90 System was contraindicated for pregnant and/or lactating females

Study Examples Of Ludwig and Savin Hair Loss Classifications And Fitzpatrick Skin Typing:

Subject ID: MEP90-0001 Last: First: MI: DOB: DDMMYY

Side View



Top of Pictures

Ludwig Hair Loss Scale Classifications:



MUST BE TYPE I OR TYPE II

Ludwig Hair Loss Classification: 1 Current Hair Status: Acceptable

Green View



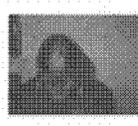
Savin Hair Loss Scale Classifications:



CAN NOT BE ACCENTED OR REVERSAL

Savin Hair Loss Classification: 0.1

Current Hair Status: Acceptable



Fitzpatrick Skin Typing

ALL QUESTIONS MUST BE ANSWERED.

Genetic Disposition						
Score	0	1	2	3	4	5
What are the color of your eyes?	Light Blue	Blue	Dark Blue	Dark Brown	Brown	Dark Brown
What is the natural color of your hair?	Very Fair	Fair	Dark	Dark Brown	Black	Black
What is the color of your skin (unexposed to sun)?	White	Fair	Fair with some tan	Light Brown	Dark Brown	Dark Brown
Do you have freckles or melasma present?	None	Several	Few	Occasional	Many	Many
Total Genetic Disposition Score: 2						

Subject ID: MEP90-0001 Last: First: MI: DOB: DDMMYY

Reaction To Sun Exposure						
Score	0	1	2	3	4	5
What happens when you step in the sun for long?	Nothing	Nothing & Peeling	Redness & Peeling	Redness	Redness	Redness
Traces appear on your face (nose)?	None	Light Orange	Moderate Tan	Dark Tan	Dark Tan	Dark Tan
Do you have freckles within several hours?	None	Several	Sometimes	Often	Always	Always
How does your face react to the sun?	Very Sensitive	Sensitive	None	Very Resistant	Very Resistant	Very Resistant
Total Sun Exposure Score: 5						

Sun Exposure Habits						
Score	0	1	2	3	4	5
When did you last expose your body to the sun or artificial tanning?	More Than 1 Month Ago	1 to 2 Months Ago	1 to 2 Months Ago	Less Than 1 Month Ago	Less Than 1 Month Ago	Less Than 1 Month Ago
How often do you expose your body to sun?	Never	Hardly Ever	Sometimes	Often	Often	Often
Total Sun Exposure Habits Score: 2						

Fitzpatrick Skin Type					
Score	0-2	3-4	5-6	7-8	9-10
Fitzpatrick Skin Type	I	II	III	IV	V-VI
Total Fitzpatrick Score: 16 Fitzpatrick Skin Type: II Fitzpatrick Acceptable/Unacceptable: Acceptable					

Availability

When Available To Start: 02/10/2008 Days: Yes No Evenings: Yes No

Getaway: Yes No Appointment: Must Be Same Each Week Can Vary Each Week

PRINCIPAL INVESTIGATOR'S CERTIFICATION

Subject ID: MEP90-0001 Medical History: **Wesley Lindsa** Ludwig Hair Loss Classification: **1**

Savin Hair Loss Classification: **0.1** Fitzpatrick Skin Type: **II**

Current Hair Status: **Wesley Lindsa** Fitzpatrick: **Wesley Lindsa**

Accepted Refused Excluded Pregnancy Review Date: 02/12/2008

Page 7 of 10

507

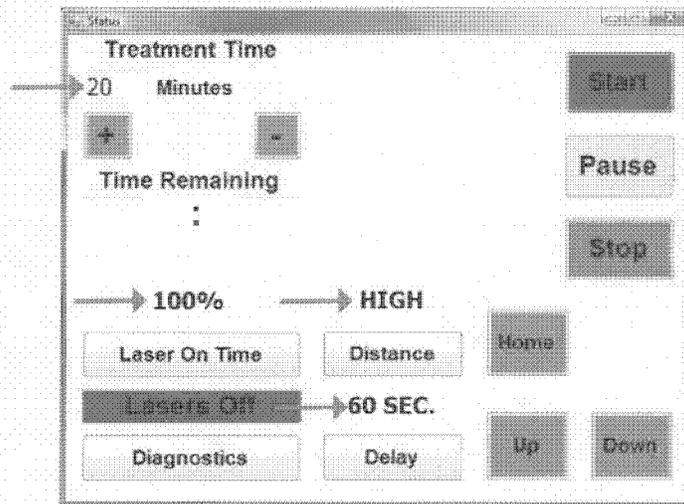
FDA Approval Clinical Treatment Protocol

Midwest RF, LLC is a registered manufacturer with the Food and Drug Administration (**Registration # 2134565**). As such, we are mandated to be in compliance with all Food and Drug Administration regulations concerning devices we manufacture and the procedures followed.

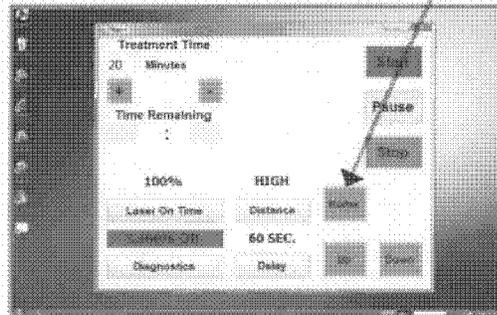
In soliciting approval to market the MEP-90 Hair Growth Stimulation System, we submitted the results of a Clinical Data Acquisition Study. The purpose of the study was to verify the safety and clinical effectiveness of the MEP-90 in a clinical environment. The study was approved by an Institutional Review Board and conducted in accordance with all Federal and applicable state law(s). The integrity of the Study results was based in part on following the exact same procedures on all subjects. What protocol used is at the sole discretion of the clinician. However, we provide the following protocol used during the Study:

STEP 1 - See page 12 Making sure the Power Switch is in the **OFF** position, and the Laser Safety Keylock is in the **OFF** position (horizontal), insert the female end of the Power Cord into the receptacle on the Mobile Base Assembly. Plug the male end of the Power Cord into an approved receptacle.

STEP 2 - See page 12 Insert the key into the Safety Keylock Assembly and turn to the **ON** position (vertical). Depress the Power Switch to the **ON** position. The computer takes approximately 30 seconds to boot up and perform System diagnostics. Once completed, the **DEFAULT** screen will appear. Verify the indicated Default settings → that were used for the clinical study:



STEP 3 - See page 13 Using the Mouse arrow, “double-click on the **HOME** button.



This calibrates the Adjustable Column Assembly, using the built-in optical encoders in the column. This calibration takes approximately 10-15 seconds.

STEP 4 - Both you and the patient put on the safety goggles. Have the patient position herself in the treatment chair, and using the Up and Down buttons with the mouse, move the Adjustable Column Assembly until the Light Therapy Hood Assembly is positioned with the bottom at the “mid-forehead position, as indicated in the example to the right. To avoid transference of human body oils, direct contact with the patient is not recommended.

Note: If the Hood Assembly stops descending, you have either reached the parameters of the Hood Tilt Shut Off or the Hood Proximity Switch. See page 16.



STEP 5 - With the patient in position, tap the button and the screen, as indicated to the right will appear.

ONLY AFTER YOU HAVE CONFIRMED THAT BOTH YOU AND THE PATIENT ARE WEARING THE APPROVED SAFETY GLASSES, click on the **Yes/Start** button and the MEP-90 will begin treating the patient. The System will automatically shut off at the completion of the 20-Minute treatment and return to the **Home** position.



This completes the FDA 510(k) Approval Protocol

Additional Features, Software Options, and Internet Connection

An IBM compatible PC consisting of an Intel Pentium 4 microprocessor with 2GB RAM and an 500GB internal hard drive controls the operation of the MEP-90. Either Microsoft® XP or Microsoft® Vista can be used as the operating system. However, Microsoft® XP is loaded into the system at production unless Microsoft® Vista is otherwise specified by the purchaser.

The MEP-90 System Console is equipped for wireless internet and provides the following outputs:

- 1 Ethernet connection
- 8 USB2 connections (4 Available)
- 2 Audio out connections
- 1 VGA video out connections
- 1 Audio in connections
- 1 Video in connections (NTSC)

As part of the Installation process, the installer will connect your MEP-90 to either your internal network or to a wireless router (not included). We strongly recommend you establish a data back-up plan that executes automatically on a regularly scheduled basis.

If you have accessory items such as back-up drives, printer, monitor, etc.; have your installer connect them to the MEP-90. We cannot guarantee the performance of any of your optional accessories, however we do guarantee the connection.

In addition to the MEP-90 System Operation Software, Midwest intends to offer specific and applicable accessories and software to meet all your practice needs.

Photography - The MEP-90 will offer a 10 megapixel camera located inside and at the top of the Hood Assembly. This will be for documenting "global or crown" and "microscopic images" of each patient. The software to operate and process the images will be a separate application and separate documentation will be provided.

Data Archiving - Midwest will offer Microsoft Access® Data Archiving software with a prepared template to archive the patient information from diagnosis to maintenance treatments. The software to operate and process the images will be a separate application and separate documentation will be provided.

PDF Reader - Midwest will install the current version of Adobe® Acrobat Reader and this Operation Manual on the MEP-90. Future changes and/or modifications will be sent to you both in hard copy and will be available over the internet.

MEP-90 System Maintenance

One of the many design features of the MEP-90 Hair Growth Stimulation System is that there is no maintenance required by the user other than keeping the product clean and stored in the proper environment as spelled out in the MEP-90 Operating Specifications that are published on page 9.

All repair and/or service to the MEP-90 System must be done by an authorized Midwest RF, LLC facility or service center. Any opening or disassembling of any system component, including the Light Therapy Hood Assembly, immediately voids the warranty.

From time to time dirt, dust, moisture and oils from the human body may settle on the MEP-90 system.

IMPORTANT: The MEP-90 System can not be sterilized by any liquid or steam method

The user may remove dirt, dust and oils by wiping the MEP-90 clean using a lint-free cloth, moistened with a non-corrosive and non-abrasive cleaner. This should only be done after making sure the MEP-90 System is not plugged in to an electrical outlet. Cleaning should be limited to wiping the MEP-90 System clean.

Care should be taken to avoid moisture saturation of all connectors or the end of the power cord at the base of the system. User should make sure they are dry prior to use of the system. Depending on the operating environment, an compressed air aerosol spray should be used to remove any dust from underneath the power switch, computer keyboard, mouse and/or the LCD monitor.

As indicated in the section MEP-90 Clinical Application Protocol section on page 20, patient contact with the Light Therapy Hood Assembly is not recommended. However, dust, human oils, and human skin particles can distort the light therapy beams by clouding the apertures and may affect clinical performance. The applicator heads should be cleaned using the following steps:

1. Blow the inside clean using a compressed air aerosol the type used to clean computers and electronics.
2. Wipe the applicator head with a lint-free cloth, moistened with a non-corrosive and non-abrasive cleaner.
3. The therapy lights can be cleaned using a Q-Tip™ type cotton swab that has been dipped in alcohol.
4. Repeat aerosol spray making sure the inside of the Light Therapy Hood Assembly, and its components, are dry before using again on patients.

Warranty and Troubleshooting Information

LIMITED WARRANTY

Midwest RF, LLC (MRF) warrants to the original purchaser of an MEP-90 Hair Growth Stimulation System that, exclusive of expendable part and other accessories, such MEP-90 System shall be free from defects in material and workmanship under normal use and service for a period of one year from date of purchase.

Midwest RF, LLC (MRF) warrants to the original purchaser of an MEP-90 Applicator Head that, exclusive of expendable part and other accessories, such MEP-90 Di-banded lasers shall be free from defects in material and workmanship under normal use and service for a period of 90 days from date of purchase.

Any defective instrument should be promptly returned, properly packaged, and postage prepaid. A Return Authorization Material number must be obtained from the MRF authorized distributor's customer service department. To establish warranty liability, a properly filled out Warranty Registration Card must be on file with MRF. Loss or damage in return shipment to the factory shall be at the purchaser's risk. If returned by the purchaser, MRF's sole obligation with respect to any such defect is limited to the repair with new or remanufactured parts, or, at MRF's option, replacement of the MEP-90 System.

This Warranty does not apply to MEP-90 Systems that have been altered, subjected to misuse, negligence, unauthorized repair, or accident, operated in manners other than those in accordance with authorized instructions, or have had the serial number altered, effaced, or removed.

This Warranty represents the exclusive obligation of MRF and the exclusive remedy of the purchaser regarding defects in an MEP-90 System. This Warranty is in lieu of all other expressed or implied warranties, including the warranty of merchantability or fitness for a particular purpose, which warranties are disclaimed.

The design and safety features of the MEP-90 System make it very user friendly and relatively trouble free. However, from time to time, normal usage and wear and tear of the products may create several operating issues.

Prior to contacting the Customer Service Department at Midwest RF, we ask that you have the system information in front of you and that you have the following information available for the Customer Service Representative:

- ∞ Serial Number of the MEP-90 Hair Growth Stimulation System
- ∞ Date of Purchase
- ∞ Description of the issue/problem
- ∞ All symptoms displayed

In almost all cases, the Customer Service Representative can "walk you through" any corrective actions necessary and have your system back in operation. Should repair be necessary, (SEE WARRANTY INFORMATION ABOVE) only the Midwest RF Customer Service Representative can provide you with the required Return Authorization Material number.

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COVER SHEET MEMORANDUM

From: Reviewer Name Atiq Chowdhury
Subject: 510(k) Number K091494/53
To: The Record SE

- Please list CTS decision code SE
- Refused to accept (Note: this is considered the first review cycle. See Screening Checklist http://eroom.fda.gov/eRoomReq/Files/CDRH3/CDRHPremarketNotification510kProgram/O_5631/Screening%20Checklist%207%202%2007.doc)
- Hold (Additional Information or Telephone Hold).
- Final Decision (SE SE with Limitations, NSE, Withdrawn, etc.).

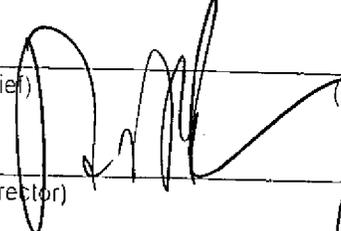
Please complete the following for a final clearance decision (i.e., SE, SE with Limitations, etc.):		YES	NO
Indications for Use Page	Attach IFU	/	/
510(k) Summary /510(k) Statement	Attach Summary	/	/
Truthful and Accurate Statement.	Must be present for a Final Decision	/	/
Is the device Class III?		/	/
If yes, does firm include Class III Summary?	Must be present for a Final Decision	/	/
Does firm reference standards? (If yes, please attach form from http://www.fda.gov/opacom/morechoices/fdaforms/FDA-3654.pdf)		/	/
Is this a combination product? (Please specify category _____, see http://eroom.fda.gov/eRoomReq/Files/CDRH3/CDRHPremarketNotification510kProgram/O_413b/COMBINATION%20PRODUCT%20ALGORITHM%20(REVISED%203-12-03).DOC)		/	/
Is this a reprocessed single use device? (Guidance for Industry and FDA Staff - MDUFMA - Validation Data in 510(k)s for Reprocessed Single-Use Medical Devices, http://www.fda.gov/cdrh/ode/guidance/1216.html)		/	/
Is this device intended for pediatric use only?		/	/
Is this a prescription device? (If both prescription & OTC, check both boxes.)		/	/
Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank?		/	/
Is clinical data necessary to support the review of this 510(k)?		/	/
Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank? (If not, then applicant must be contacted to obtain completed form.)		/	/
Does this device include an Animal Tissue Source?		/	/
All Pediatric Patients age <=21		/	/
Neonate/Newborn (Birth to 28 days)		/	/
Infant (29 days - < 2 years old)		/	/
Child (2 years - < 12 years old)		/	/
Adolescent (12 years - < 18 years old)		/	/
Transitional Adolescent A (18 - <21 years old) Special considerations are being given to this group, different from adults age ≥ 21 (different device design or testing; different protocol procedures, etc.)		/	/

Transitional Adolescent B (18 -<= 21; No special considerations compared to adults => 21 years old)
Nanotechnology
Is this device subject to the Tracking Regulation? (Medical Device Tracking Guidance, <http://www.fda.gov/cdrh/comp/guidance/169.html>) Contact OC.

Regulation Number	Class*	Product Code
21 CFR 90.5500	II	O.A.P

(*If unclassified, see 510(k) Staff)

Additional Product Codes: _____

Review: _____
(Branch Chief)  (Branch Code) (Date)

Final Review: _____
(Division Director) (Date)

Do Dir
2/23/2010

**Premarket Notification [510(k)] Review
Traditional**

K091496/S3

DATE: February 22, 2010

TO: The Record

FROM: Atiq Chowdhury (Biomedical Engineer)

OFFICE: ODE

DIVISION: DSORD

510(K) HOLDER: Midwest RF, LLC

DEVICE NAME: MEP-90 Growth Stimulation System

CONTACT: Helmut Keidl, President
Midwest RF, LLC
1050 Walnut Ridge Drive
Hartland, Wisconsin 53029
Torrance, CA 90505

PHONE: 262-367-8254

FAX: 262-367-8544

EMAIL: helmut@midwestcomposite.com

I. Purpose and Submission Summary:

The 510(k) holder would like to introduce the MEP-90 Growth Stimulation System. Under this submission the sponsor is seeking clearance to market this new device for Prescription Use and as a Class II device. I recommend that the subject device, - 90 Growth Stimulation System, is found SE to its predicates in regard to indications of use, technical specifications, biocompatibility, materials, sterility, performance testing, labeling, safety and effectiveness. There are no significant differences which raise issues of safety

II. Administrative Requirements

	Yes	No	N/A
Indications for Use page (Indicate if: Prescription or OTC)	X		
Truthful and Accuracy Statement	X		
510(k) Summary or 510(k) Statement	X		
Standards Form	X		

III. Device Description

	Yes	No	N/A
Is the device life-supporting or life sustaining?		X	

	Yes	No	N/A
Is the device an implant (implanted longer than 30 days)?		X	
Does the device design use software?	X		
Is the device sterile?		X	
Is the device reusable (not reprocessed single use)?	X		
Are "cleaning" instructions included for the end user?			

The sponsor states the device, MEP-90 laser system, is to be used as an adjunctive for treatment of hair loss in women with androgenic alopecia, with Ludwig and Savin hair loss scale classification of I to II and Fitzpatrick skin types I-IV. The MEP-90 system consists of a computer that controls a dome that fits over a subject's head, providing stationary low-level laser equally spread over the entire scalp; this is intended to provide biostimulation, leading to hair growth. It uses a wavelength of 650 nm with a maximum power emission of 3 mW/cm². The sponsor believes that their device is preferable to the predicate for intended use due to the tighter control over the wavelength as well as the ability to expose a larger surface area.

IV. Indications for Use

The indication for use as given in the IFU statement (pg 10) is, "The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for: Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV."

Review of the sponsor's clinical data was found to be not adequate to support these indications for use. Thus, they are being asked to provide a revised clinical study **(See Performance Data—Clinical and Deficiencies)**.

(b)(4)

(b)(4)

The sponsor has not provided sufficient data regarding their “adjunctive use” claim. It appears that our understanding of the term “adjunctive use” is not the same as the sponsor’s. The Agency uses the term “adjunctive” to mean use in combination with other therapies, where as, they appear to define the term to mean use with the availability of other treatment options. According to our definition of adjunctive to mean use with the combination of other therapies, the term adjunctive needs to be deleted from their Indications for Use since they stated that you have excluded all other therapies during your treatment (**See Deficiencies**).

S3 Cycle:

The sponsor has removed their “reduce hair loss” and “adjunctive us” claims from their Indications for use. It now states, “The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR 890.550 and is indicated for: the treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.” This is found adequate.

V. Predicate Device Comparison

The sponsor has listed two predicate devices and is claiming substantial equivalence to them, K060305– Hairmax Lasercomb and K032816 – Quantum Light Therapy System. The sponsor has provided a comparison table in their Substantial Equivalence Section (section pg 36) discussing the similarities of the device and its predicate in the areas of: output energy and wavelengths. (b)(4)

(b)(4)

S1 Cycle:

It appears the sponsor has misunderstood the question and did not satisfy the requirements of the previous AI Letter. Thus, the sponsor is being asked to provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. (b)(4)

(b)(4)

In addition, the subject device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, where as K060305 is a

comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

S2 Cycle:

The sponsor has provided a revised Device Comparison Table, on pages 45-48, in the areas of Indications for Use Statement), Wavelength Range, Energy Range, (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. The Device is a CW Diode Laser, that has a wavelength of 650nm, Output Power of less than or equal to $4.5mw/cm^2$. This is found similar to the predicates and is adequate.

VI. Labeling

The sponsor has provided draft package inserts for device that include necessary safety instructions, warnings, and warranty statements. However, the sponsor's indications may need to be revised pending Substantial Equivalence decision, thus, may alter the Operator's Manual.

S3 Cycle:

The sponsor has provided revised Labeling of the Operator's Manual which reflects the cleared Indications for Use (pg 32). This is found adequate.

VII. Sterilization/Shelf Life/Reuse

The sponsor states that the device will be supplied non sterile and reusable. The sponsor has provided Maintenance instructions for the device (Operator's Manual pg 100). The sponsor states the device may be cleaned with a cloth and mild detergent on the surface. This is found adequate.

VIII. Biocompatibility

The sponsor states (section 15) that the biocompatibility tests were not found applicable since the same patient contacting materials were found in the predicate.

(b)(4)

S2 Cycle:

The sponsor has stated on pages 47 and 49 that there are no new materials from predicate K060305 and K032816 in the patient contacting materials. Even though the sponsor has stated that there are no patient contacting materials, that is highly unlikely due to the treatment regime of the bonnet type device. However, since the patient contacting materials are the same as the predicate, this response is found adequate.

IX. Electromagnetic Compatibility and Electrical, Mechanical and Thermal Safety
The sponsor states (pg 38) they complied with IEC 60601-1-2 and to 21 CFR 1040.10. This is found adequate.

X. Performance Testing – Bench
None Provided

XI. Performance Testing – Animal
None Provided

XII. Performance Testing – Clinical

(b)(4)

at the 18 week assessment. The study population was primarily Caucasian (69%) and African American (27%); the remaining 4% were Hispanic (2%) and Other (2%).

(b)(4)

S1 Cycle:

The sponsor responded with a letter which suggested that these comments were inappropriate, accusatory, and overall reflective of a non-objective evaluation of the submission. They further escalated the review to the CDRH Ombudsman, Les Weinstein. However, they have provided their Hair Count Methodology and Hair Count Data for individual patients.

The sponsor's response was reviewed by Richard Felten (DSORD/GSDB) and the Statistics by Scott Miller (DBS/GSDB) (See Attached Memos).

Richard Felten discussed several issues, the ones of importance:

1. (b)(4)
- 2.

Scott Miller's Summary:

(b)(4)

-
-
-
-
-
-
-
-
-

S2 Cycle:

Scott Miller provided the Statistical Consultation of the sponsor's S2 Response.

(b)(4)

An internal meeting was held with the review team (Atiq Chowdhury, Richard Felten, Neil Ogden, and Scott Miller) to discuss the clinical study. The team found serious limitations with the data submitted, but short of conducting an entirely new trial designed to better minimize these concerns, it was decided to move forward with the given data, the sponsor will be asked to provide the following as an alternative data analysis. Take a random sample of the subjects in the trial (at least 50%). Have three individuals re-count the hair growth for these subjects in such a way that they are unaware of the previous hair counts, the other re-counters' hair counts, any patient identifiers, or the time-point of assessment (e.g. baseline, 10 week follow-up, 18 week follow-up, etc.) This could be achieved by collecting all photographs used in determining the hair count for these subjects, and de-identifying them (by assigning each subject / time-point photo some unique identifier via a system not accessible to the counters, then presenting them in some random fashion such that subject identity and time are not known or inferred by the counters.) If the revised counts for this subsample of the data were in relatively good agreement with the original counts, it would provide some assurance to rule out the possibility of an over-estimation of hair counts due to a single, un-blinded investigator. It would also provide some estimate of the variability associated with the initial hair counts.

Scott Miller's complete comments to the sponsor were limited to just the alternative analysis approach in order to move forward with the given clinical study. Miller was contacted by (E-mail 10/31/09) to approve the decision in which he complied.

S3 Cycle:

Scott Miller provided the Statistical Consultation of the sponsor's S2 Response. After a meeting of the review team, it was decided that a possible way forward would be for the sponsor to take a random sample of subjects and time-points and have several raters evaluate them in a blinded fashion. This would allow an assessment of the variability of the hair counts, as well as some estimate of the potential for evaluator

bias arising from an un-blinded assessment of the hair counts. The previous review requested that the sponsor conduct a blinded re-count of a portion of the original data to address the issue of blinding and provide an estimate of the variability in the hair counts. The sponsor agreed to this request and has now submitted the results of the re-count. This review memo is an evaluation of the sponsor's data.

2. Comments

The sponsor's recount included 33 randomly selected subjects. For each subject, the baseline, 10-week and 18-week photographs were de-identified and assigned unique identifiers which did not provide information on the subject or time-point. Four independent individuals not affiliated with the original study were trained as to counting and provided independent assessments. In addition, the sponsor had an additional within-company rater evaluate as well. The resulting data were tabulated by subject and submitted to FDA.

The data are supportive of the sponsor's conclusion that the re-count demonstrates relatively good agreement in terms of the observed counts. The sponsor has flagged four subjects which demonstrated somewhat higher variability in the re-counts than the other subjects. As the sponsor points out, none of these re-counts would lead to changing the conclusion regarding the hypothesis of increased hair counts.

3. Conclusions

Overall, the sponsor's submitted re-count data appears to demonstrate relatively consistent hair counts in comparison with the original counts. This data adequately addresses the concerns regarding a potential assessment bias due to a single, un-blinded counter. The variability observed appears to be reasonable, and of the observations with increased variability, the conclusions from the original counts remain unchanged.

Richard Felten provided the clinical consult for the S3 Response. He states the company provided blinded counts for 33 subjects which they say is 53% of the total. The blinding system does appear to be extremely well done and I have no issues with this.

There are a couple of subjects which the company identified as having values that have large variances in them. What I noticed that this occurred both as a negative, blinded evaluator counted fewer hairs (subject 7) and more hairs (subject 16). I do not see this as causing any real issue since the subjects still demonstrated an effect.

I also did a count where I arbitrarily used an increase of 20 or more hairs as a success. Using this criteria there are 29/33 successes.

I also noted that 16/33 had the new company evaluator agreeing with the original count.

I also looked at change in hair counts from week 10 to week 18. In this category, again sort of arbitrary, I would state that 22/33 showed strong continued growth and 25/33 showed some growth. What this means is that 4 of the subjects that showed a positive increase in hair counts at week 18 actually had a lower count at week 18 than at week 10.

Conclusion:

Based upon the statistical and clinical review of the sponsor's alternative data set approach, it can be concluded the data found is satisfactory and can support the Substantially Equivalent decision.

XIII. Software

The sponsor states that this device has a moderate level of concern.

Version:		
Level of Concern: Minor		
	Yes	No
Software description:	X	
Device Hazard Analysis:	X	
Software Requirements Specifications:	X	
Architecture Design Chart:		X
Software Design Specifications:		X
Traceability Analysis/Matrix:	X	
Software Development:		X
Verification & Validation Testing:	X	
Revision level history:	X	
Unresolved anomalies:		

All software sections contained within this submission are found to be acceptable documentation of the software and meet the software concerns as described in the FDA Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices, dated May 29, 1998.

XIV. Substantial Equivalence Discussion

	Yes	No
1. Same Indication Statement?	X	If YES = Go To 3
2. Do Differences Alter The Effect Or Raise New Issues of Safety Or Effectiveness?		If YES = Stop NSE
3. Same Technological Characteristics?	X	If YES = Go To 5
4. Could The New Characteristics Affect Safety Or Effectiveness?		If YES = Go To 6
5. Descriptive Characteristics Precise Enough?	X	If NO = Go To 8 If YES = Stop SE
6. New Types Of Safety Or Effectiveness Questions?		If YES = Stop NSE
7. Accepted Scientific Methods Exist?		If NO = Stop NSE
8. Performance Data Available?		If NO = Request Data
9. Data Demonstrate Equivalence?		Final Decision: SE

XIV. Responses to Deficiencies

1. Substantial Equivalence – Revised Device Comparison Table

In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm²), Pulse Duration (µs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

Reviewer's Comments:

It appears the sponsor has misunderstood the question and did not satisfy the requirements of the previous AI Letter. Thus, the sponsor is being asked to provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (µs), and Pulse Rate (Hz), Sterilization, and Materials. They are being asked to include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile) (See Deficiencies).

2. Substantial Equivalence: Clinical Data

The information provided in this submittal is not adequate for a determination of improved hair growth. The deficiencies identified in this review are:

1. You did not use a placebo control group for comparison. Since this is a low level laser therapy system, a placebo control is required for such clinical studies and the predicate laser, the Lexington International HairMax, did have a randomized, blinded evaluation, placebo control study.
2. You have not provided individual data for the individual subjects enrolled in the study.
3. You have not provided the actual statistical analyses performed to determine success and have not provided a detailed protocol for the study.
4. Based on the summary information provided, there does not appear to be any actual data for the requested indication for use of preventing or reducing hair loss.

At this time an adequate review of this application from a clinical perspective is not possible. Without having a placebo control arm for comparison and not having evidence that there was randomization between treated and placebo control, the data provided in this application is inadequate.

Please provide data from a placebo control, randomized clinical study to support your requested indications for use.

(b)(4)

The following Additional Questions involve the Statistical Concerns of the submission:

Please provide a revised clinical study which addresses the following concerns:

- (b)(4)
- A large proportion of subjects screened were not accepted (82 accepted out of 157 screened.) It is unclear why the remaining 75 subjects (48% of

the total screened) were not enrolled. In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

- (b)(4)
- The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

- (b)(4)
-

Reviewer's Comments:

Please refer to Statistician's Review Memo, Scott W. Miller (DBS, GSDB), for comments.

XV. Responses to Deficiencies (S1)

1. Substantial Equivalence – Revised Device Comparison Table

In our previous AI Letter Dated July 22, 2009 under Deficiency #1, there was a typo. Originally it stated:

"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your

device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."

It should have stated:

*"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have **not provided an adequate** comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."*

Regardless, in your answer to that deficiency, it appears that you have misunderstood the question. The Substantial Equivalence section must contain a stand-alone comparison of your device's technological characteristics along with other pertinent information compared to the predicates. That information is not referred to other sections, but provided in this section as a quick summary/comparison to the predicates. Thus, the deficiency above is asking to provide a Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

- A. Please provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. Also, please include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile).

Comments Regarding Your Response to Deficiency #1:

- In your response dated August 18, 2009 on page 6, your comments regarding the Indications for Use comparison, you refer to a bulleted list which points out similarities between the subject device and the predicates. This does not satisfy the requirements of what the original AI Letter asked, "compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement)." Thus, please revise your Device Comparison Table that includes a comparison of your device to the predicates in the area of:

Indications of Use (which is reflective of the Indications for Use Statement).

- The Energy Range comparison you have provided is regarded as the power density. This comparison was found adequate. Please include them in your revised Device Comparison Table.

Reviewer's Comments:

The sponsor has provided a revised Device Comparison Table, on pages 45-48, in the areas of Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. The Device is a CW Diode Laser, that has a wavelength of 650nm, Output Power of less than or equal to 4.5mw/cm². This is found similar to the predicates and is adequate.

2. Biocompatibility

You have not addressed the biocompatibility issue for the patient contacting materials of your device. Since this is a bonnet type device, there is a strong possibility that the interior materials will come in contact with the individual's scalp.

- a. Please describe the patient contacting materials of your device.
- b. Please provide the biocompatibility test results of your patient contacting materials, or provide predicates.

Reviewer's Comments:

The sponsor has stated on pages 47 and 49 that there are no new materials from predicate K060305 and K032816 in the patient contacting materials. Even though the sponsor has stated that there are no patient contacting materials, that is highly unlikely due to the treatment regime of the bonnet type device. However, since the patient contacting materials are the same as the predicate, this response is found adequate.

The following Statistical Comments are in regards to your Response to our AI Letter Dated July 22, 2009:

Comment 1: There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.

You responded that a requirement to submit a double-blind, sham-control, randomized clinical trial is inappropriate and not reflective of the "least burdensome" requirements. You also state that this is a conclusion "not based on science, statistics, FDA regulations, or the contents of our 510(k) submission." You further state (without providing justification or elaboration) that the disease is such that a double-blind study "could lead to improper estimations."

(b)(4)

The preference for a double-blind, sham-control, randomized clinical trial is not due to simple personal preference of the reviewer. It is based on the well-established recognition of such trials as the gold standard for clinical research. As stated in the E9 guideline on statistical principles for clinical trials “the most important design techniques for avoiding bias in clinical trials are blinding and randomization” (Section II C (2.3))¹. The clinical trial submitted in support of this device did not utilize either of these methods. Further on (2.3.1) the document defines double-blind and single-blind trials and states “the double-blind trial is the optimal approach.” While it goes on to recognize that there are situations in which a double-blind trial is not feasible, it then recommends “the single-blind option should be considered...clinical assessments should be made by medical staff who are not involved in treating subjects and who remain blind to treatment.”

To quote from Piantadosi “investigators often underestimate the value of treatment and assessment masking. There is a tendency to believe that biases are small in relation to the magnitude of treatment effects (when, in fact, the converse is usually true) or that practitioners can compensate for their prejudice and subjectivity”².

¹ Guidance for Industry: E9 Statistical principles for clinical trials. FDA, 1998.

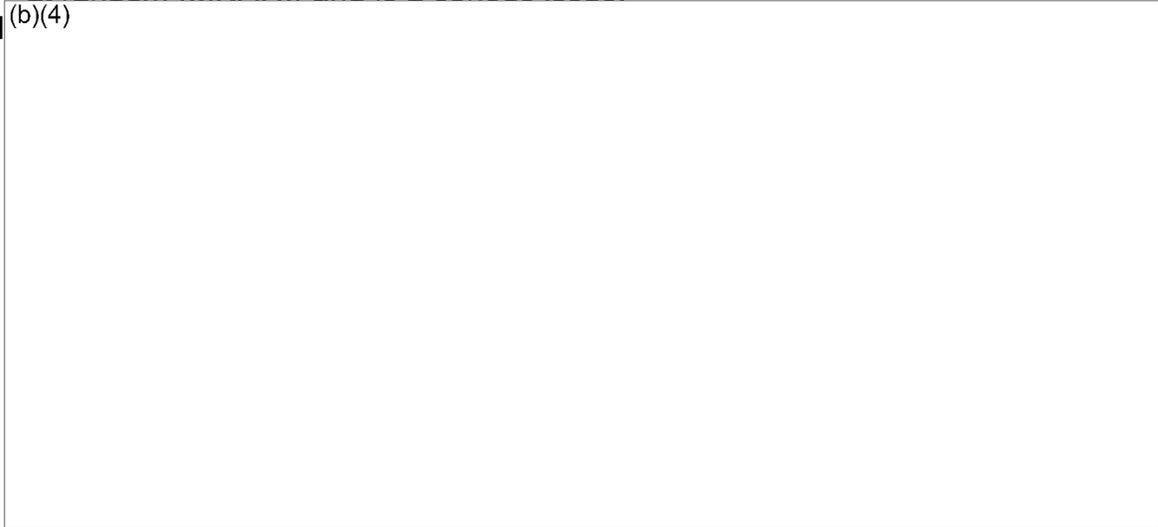
<http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm073137.pdf>

² S. Piantadosi. Clinical trials: a methodologic perspective. 1997. Wiley, New York.

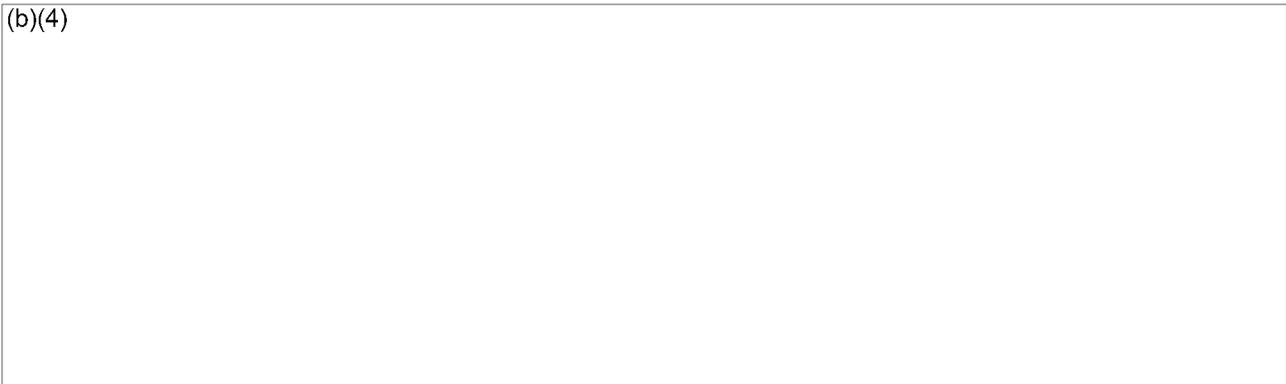
(b)(4)

would refer to the following quote on page 26 of your response: "Anecdotal statements such as 'I would never have continued this for six months if it wasn't working' became the slogan of the study". This implies that at least some subjects would have considered dropping out of the study for a perceived lack of effectiveness. The possibility that subjects with missing data are not a random sample of the study population, but that they may have dropped for a reason related to their (unobserved) missing outcome data is referred to as missing not at random (MNAR) and is a serious issue.

(d)(b)(4)



(b)(4)



Section V, part D (5.4) discusses follow-up. Specifically "completeness is defined as the proportion of patients entering the trial who come back for each and every follow-up appointment. It is extremely important that this proportion be as close to 100% as possible... follow-up percentages of less than 80% are generally considered poor and these trials are labeled incomplete." Further, "incomplete follow-up is a major concern in analysis. The trial must have procedures available to trace subjects who fail to appear for scheduled follow-up. Accounting for subjects lost to follow-up is a critical analytical issue because those patients may provide the most important information from the clinical trial, particularly if the outcome in such patients is poor."

³ Statistical guidance for clinical trials of non-diagnostic medical devices. FDA, 1996.
<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm106757.htm>

(b)(4)

The intent to treat concept is further discussed in Section V, part B (5.2.1) “the intention-to-treat principle implies that the primary analysis should include all randomized subjects.” Further on “there are a limited number of circumstances that might lead to excluding randomized subjects from the full analysis set, including the failure to satisfy major entry criteria (eligibility requirements), the failure to take at least one dose of trial medication, and the lack of any data post-randomization.” It goes on to specify the circumstances these exclusions should satisfy. It then states, “special problems arise in connection with subjects withdrawn from treatment after receiving one or more doses who provide no data after this point, and subjects otherwise lost to follow-up, because failure to include these subjects in the full analysis set may seriously undermine the approach.” In Section V, part C (5.3) it elaborates on missing data “missing values represent a potential source of bias in a clinical trial...an investigation should be made concerning the sensitivity of the results of analysis to the method of handling missing values, especially if the number of missing values is substantial.”

Comment 3: The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.

You responded that you felt that submitting a rigorous definition of how the primary endpoint of hair count was determined was not required for an initial 510(k) submission. Nevertheless, you went on to provide a detailed, several page description of this process.

The information provided adequately addresses the statistical reviewer’s concerns on this point.

(b)(4)

Comment 4: The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

You responded that this is not technically a question, but rather a "biased and irrelevant determination." You then clarified that the trial was conducted at one site (in High Point, North Carolina). You then claim that geographic issues are irrelevant, as the treatment is a laser at a wavelength subjects would not encounter in everyday life. You conclude with an exaggeration that the request was asking for studies to be conducted "in every corner of the world to be valid."

This comment was, unfortunately, truncated from its original intent. It should have contained the question: "Please clarify which site(s) participated in the submitted trial".

Regarding your claim that the implied determination was "biased and irrelevant". The issue of study population is highly relevant to the trial. You are asking FDA to clear for use a device intended for women with androgenic alopecia. You enrolled 82 subjects (only 60 of whom completed the trial). Subjects enrolled and treated at a single site may not be representative of the target population. For example, subjects treated at a single site are likely to be more homogeneous than the broader population in terms of variables such as: race, ethnicity, income, skin type, etc. To the extent that any of these variables is associated with responsiveness to the device or compliance with the treatment regimen, these issues are highly relevant.

Further, all subjects treated in this trial were done so under the aegis of a single clinical investigator. It is possible that this clinician is substantially more familiar with the device than other clinicians would be if the device were cleared for use. It is possible that the use of the device by such other clinicians may lead to variations in safety and / or effectiveness, perhaps only in a learning curve of the first few subjects, perhaps of longer duration. By conducting the trial at only one site, with one clinical investigator, these possibilities can not be adequately evaluated.

This issue is reflected in both the E9 guideline "the subjects in the trial should ... mirror the target population" (Section II B (2.2.1))¹ as well as the CDRH statistical guidance: "the study population should be a representative subset of the population targeted for the application of the medical device."³

(b)(4)

The following are deficiencies regarding the Clinical and Statistical Concerns of the submission:

3. Indications for Use—Need for Clinical Data

Your proposed indication for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," is not the same as predicate K060305's indications for use. Your claim for the treatment of females with androgenetic alopecia is not the same as predicate K060305's claim for treatment of males. In addition, your device has an indication for "reduce rate of hair loss in females," where as K060305 does not have a reduce hair loss claim in their indications for use.

Your device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, where as K060305 is a comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

- Regarding your reduce rate of hair loss in females claim, this indication for use must be removed or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

Reviewer's Comments:

The sponsor has stated that they will comply with providing all necessary clinical data. However, they have no provided sufficient data regarding their "reduce hair loss claim" and "adjunctive use" claims (See Deficiencies).

4. Clinical Protocol Package

Please provide the entire clinical protocol package which includes the statistical success hypothesis used in this clinical study.

Reviewer's Comments:

The sponsor has provided the entire clinical protocol package which states the statistical success hypothesis used in this clinical study. This is found adequate.

5. Indications for Use Clarification

The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then

their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

Your response points out that concurrent alternative therapy was an exclusion criterion of the trial.

(b)(4)

In the absence of any clinical data on subjects treated with concurrent therapy, it is extremely difficult for FDA to evaluate the appropriateness of this proposed indication for use. The only clinically valid interpretation possible would be that the device is safe and effective when used as a monotherapy. There is no data to support its use in addition to other treatments, which may alter the safety and / or effectiveness of the investigational device.

- Please address this issue, given that the study population (women not using concurrent therapy) appears to be different from the intended target population (women who may or may not be using concurrent therapy).

Reviewer's Comments:

*The sponsor has not provided sufficient data regarding their "adjunctive use" claim. It appears that our understanding of the term "adjunctive use" is not the same as the sponsor's. The Agency uses the term "adjunctive" to mean use in combination with other therapies, where as, they appear to define the term to mean use with the availability of other treatment options. According to our definition of adjunctive to mean use with the combination of other therapies, the term adjunctive needs to be deleted from their Indications for Use since they stated that you have excluded all other therapies during your treatment (**See Deficiencies**).*

6.

(b)(4)

discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

You state that this information was available in the original submission, but failed to provide a page number reference. You then state that they feel this question “insinuates multiple criminal allegations of noncompliance.”

This question regards the issue of analysis datasets. Virtually every clinical trial submitted for FDA review clearly delineates multiple analysis datasets. These typically consist of:

- A safety dataset, used for adverse event analysis and consisting of all subjects enrolled in the trial.
- A full analysis or intent to treat dataset, used for the primary effectiveness analysis and consisting of all subjects randomized to receive treatment.
- A per protocol dataset, used to replicate the primary effectiveness analysis and consisting of all subjects in the intent to treat dataset who meet pre-defined protocol adherence criteria.

(b)(4)

As stated in the E9 guideline “the protocol should also specify procedures aimed at minimizing any anticipated irregularities in study conduct that might impair a satisfactory analysis, including various types of protocol violations, withdrawals, and missing values” (Section V, part B (5.2))

- Please clarify which subjects were assessed in the safety analysis; e.g., all screened subjects, all enrolled subjects, all subjects who were

evaluated at the first assessment, all subjects who were evaluated at the second assessment, etc.

Reviewer's Comments:

(b)(4)

7. Clarification on Hair Count Method

From your explanation of your hair count method beginning on page 25 of your response to our AI Letter Dated July 22, 2009, it appears that the head was divided into quarters with multiple photographs being taken of each quarter. But on page 26, there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. It is unclear what is meant by the phrase "count photo," since it appears all photos were being counted. In addition, this method seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Thus, depending on how this process is interpreted it seems that for each individual, up to 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. If this assumption is correct, what method was used to insure that baseline and follow-up photographs were identical in terms of scalp area viewed within each photograph. Please provide clarification on your Hair Count Method.

Reviewer's Comments:

The sponsor has a detailed explanation on their hair-count methodology on pages 42-44. This issue of whether the fixation of the head would play a role on each hair count was satisfied since the manner in which the hairs are counted are done by taking an image perpendicular to the desired location. This was found adequate.

XVI. Responses to Deficiencies (S3)

1. Alternative Data Analysis

(b)(4)

Reviewer's Comments:

The sponsor has provided the alternative hair counts by photographs and using random sample of subjects, time-points, and several raters evaluate them in a blinded fashion. The sponsor's recount included 33 randomly selected subjects. For each subject, the baseline, 10-week and 18-week photographs were de-identified and assigned unique identifiers which did not provide information on the subject or time-point. Based upon the statistical and clinical review of the sponsor's alternative data set approach, it can be concluded the data found is satisfactory and can support the Substantially Equivalent decision.

2. Indications for Use—Reduce Hair Loss and Adjunctive Use Claims

Your proposed indications for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," are not the same as predicate K060305's indications for use. Your claims for "adjunctive use for the treatment of androgenic alopecia in females" and "reduce rate of hair loss in females," are not found in predicate K060305.

- Adjunctive use for the treatment of androgenic alopecia in females:
 - i. You responded on Page 9, paragraph 4 that you are offended by this contradictory statement and feel that it raises concerns over the objectivity of the review. It appears that our understanding of the term "adjunctive use" is not the same as yours. The Agency uses the term "adjunctive" to mean use in combination with other therapies, where as, you appear to define the term to mean use with the availability of other treatment options. According to our

definition of adjunctive to mean use with the combination of other therapies, the term adjunctive needs to be deleted from your Indications for Use since you stated that you have excluded all other therapies during your treatment.

- Reduce Rate of hair loss in females:
 - i. Your response on Page 9, paragraph 2 states that it is not possible to estimate a rate of hair loss. In addition, evidence of hair growth does not necessarily support prevention of hair loss since the number of hairs being counted could be the result of new hair growth minus continued hair loss. Please remove your "reduce hair loss" claim, or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

Reviewer's Comments:

The sponsor has removed their "reduce hair loss" and "adjunctive us" claims from their Indications for use. It now states, "The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR 890.550 and is indicated for: the treatment of androgenic alopecia in females by promoting hair growth of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV." This is found adequate.

XVII. ^{(b)(4)}

XVIII. Recommendation

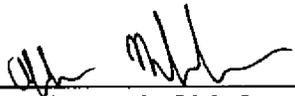
Regulation Number: 21 CFR 890.5500
Regulation Name: Infrared Lamp
Regulatory Class: Class II
Device Code: OAP



Reviewer
Atiq Chowdhury
Biomedical Engineer
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

2/22/10

Date

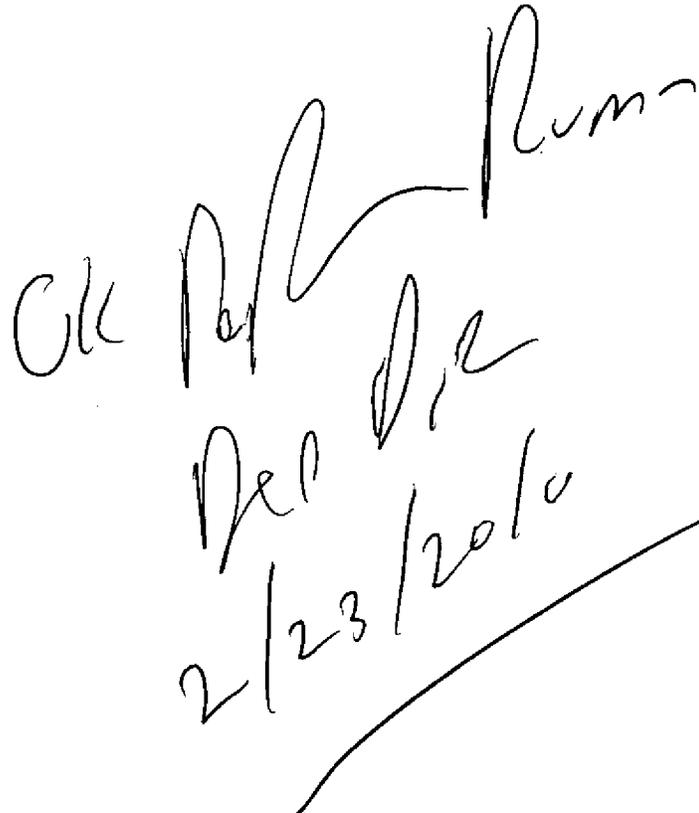
 for Neil Ogden.

Acting Branch Chief
Abbas Bandukwala
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

2/22/2010

Date

OK
Neil Ogden
2/23/2010





MEMORANDUM

Date: January 29, 2010

To: Atiq Chowdhury, WO66-1447
Regulatory review officer
General Surgery Devices Branch, DSORD

From: Scott W. Miller, WO66-2321
Mathematical statistician
General Surgery Devices Branch, DBS

Subject: Review of 510(k) submission K091496 / S003
MEP-90 hair growth stimulation system
Midwest RF

1. Background and Summary

This 510(k) submission is designed to support clearance of Midwest RF's MEP-90 hair growth stimulation system. The device is intended for hair re-growth in women with androgenic alopecia. The initial summary of safety and effectiveness was fairly short, and provided only summary statistics. My initial review focused on those aspects of the trial's design and analysis which could have lead to biased or non-representative estimates of the true effectiveness of the device. The sponsor responded with a letter which suggested that these comments and others from other members of the review team were inappropriate, accusatory, and overall reflective of a non-objective evaluation of the submission. They further escalated the review to the CDRH Ombudsman. Subsequently the review team scheduled a conference call with the sponsor in the GSDB director's office to discuss the issues of concern. They subsequently sent another response letter which clarified some issues but did not fully address all of my concerns. After a meeting of the review team, it was decided that a possible way forward would be for the sponsor to take a random sample of subjects and time-points and have several raters evaluate them in a blinded fashion. This would allow an assessment of the variability of the hair counts, as well as some estimate of the potential for evaluator bias arising from an un-blinded assessment of the hair counts. The previous review requested that the sponsor conduct a blinded re-count of a portion of the original data to address the issue of blinding and provide an estimate of the variability in the hair counts. The sponsor agreed to this request and has now submitted the results of the re-count. This review memo is an evaluation of the sponsor's data.

2. Comments

The sponsor's recount included 33 randomly selected subjects. For each subject, the baseline, 10-week and 18-week photographs were de-identified and assigned unique identifiers which did not provide information on the subject or time-point. Four independent individuals not affiliated

33

with the original study were trained as to counting and provided independent assessments. In addition, the sponsor had an additional within-company rater evaluate as well. The resulting data were tabulated by subject and submitted to FDA.

The data are supportive of the sponsor's conclusion that the re-count demonstrates relatively good agreement in terms of the observed counts. The sponsor has flagged four subjects which demonstrated somewhat higher variability in the re-counts than the other subjects. As the sponsor points out, none of these re-counts would lead to changing the conclusion regarding the hypothesis of increased hair counts.

3. Conclusions

Overall, the sponsor's submitted re-count data appears to demonstrate relatively consistent hair counts in comparison with the original counts. This data adequately addresses the concerns regarding a potential assessment bias due to a single, un-blinded counter. The variability observed appears to be reasonable, and of the observations with increased variability, the conclusions from the original counts remain unchanged.

If you have any questions, please contact me at (301)-796-6019 or Scott.Miller@fda.hhs.gov.

Scott W. Miller, PhD

CC:
Phyllis Silverman, WO66-2226
Telba Irony, WO66-2232
Richard Felten, WO66-1436
Neil Ogden, WO66-1438
DBS Reviews



COVER SHEET MEMORANDUM

From: Reviewer Name Atiq Chowdhury
Subject: 510(k) Number 1096496/SZ
To: The Record

Please list CTS decision code AI

- Refused to accept (Note: this is considered the first review cycle, See Screening Checklist http://eroom.fda.gov/eRoomReq/Files/CDRH3/CDRHPremarketNotification510kProgram/0_5631/Screening%20Checklist%207%202%2007.doc)
- Hold (Additional Information or Telephone Hold).
- Final Decision (SE, SE with Limitations, NSE, Withdrawn, etc.).

Please complete the following for a final clearance decision (i.e., SE, SE with Limitations, etc.):		YES	NO
Indications for Use Page	Attach IFU		
510(k) Summary /510(k) Statement	Attach Summary		
Truthful and Accurate Statement.	Must be present for a Final Decision		
Is the device Class III?			
If yes, does firm include Class III Summary?	Must be present for a Final Decision		
Does firm reference standards? (If yes, please attach form from http://www.fda.gov/opacom/morechoices/fdaforms/FDA-3654.pdf)			
Is this a combination product? (Please specify category _____, see http://eroom.fda.gov/eRoomReq/Files/CDRH3/CDRHPremarketNotification510kProgram/0_413b/CO-MBINATION%20PRODUCT%20ALGORITHM%20(REVISED%203-12-03).DOC)			
Is this a reprocessed single use device? (Guidance for Industry and FDA Staff – MDUFMA - Validation Data in 510(k)s for Reprocessed Single-Use Medical Devices, http://www.fda.gov/cdrh/ode/guidance/1216.html)			
Is this device intended for pediatric use only?			
Is this a prescription device? (If both prescription & OTC, check both boxes.)			
Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank?			
Is clinical data necessary to support the review of this 510(k)?			
Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank? (If not, then applicant must be contacted to obtain completed form.)			
Does this device include an Animal Tissue Source?			
All Pediatric Patients age <=21			
Neonate/Newborn (Birth to 28 days)			
Infant (29 days - < 2 years old)			
Child (2 years - < 12 years old)			
Adolescent (12 years - < 18 years old)			
Transitional Adolescent A (18 - <21 years old) Special considerations are being given to this group, different from adults age ≥ 21 (different device design or testing, different protocol procedures, etc.)			

Transitional Adolescent B (18 <= 21; No special considerations compared to adults => 21 years old)			
Nanotechnology			
Is this device subject to the Tracking Regulation? (Medical Device Tracking Guidance, http://www.fda.gov/cdrh/comp/guidance/169.html)	Contact OC.		

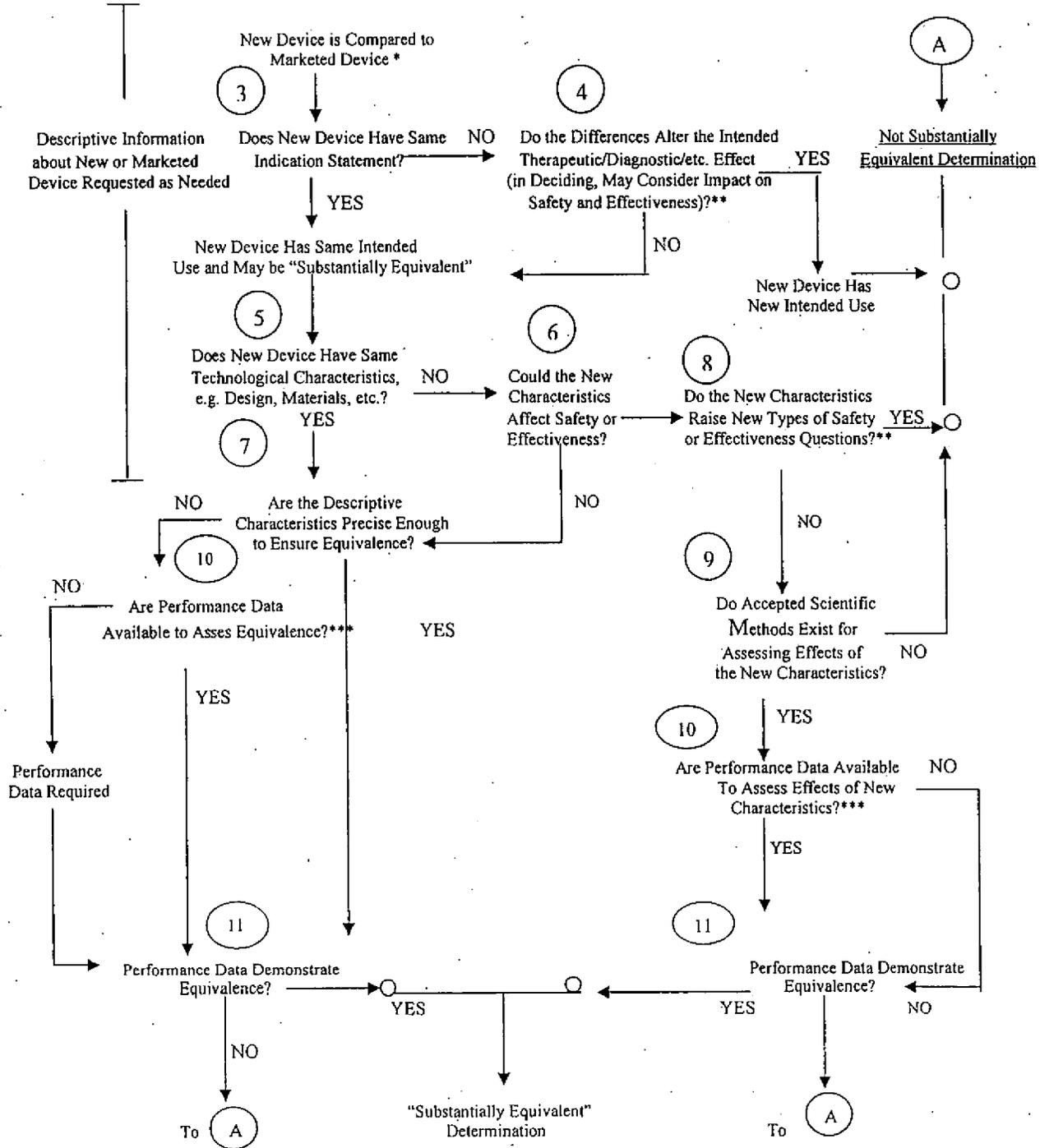
Regulation Number	Class*	Product Code
890.5500	II <small>(*If unclassified, see 510(k) Staff)</small>	OAP

Additional Product Codes: _____

Review: <u>Neil R. [Signature]</u> (Branch Chief)	<u>G50B</u> (Branch Code)	<u>2/2/09</u> (Date)
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Final Review: _____
(Division Director) (Date)

510(k) "SUBSTANTIAL EQUIVALENCE" DECISION-MAKING PROCESS



- ❖ 510(k) Submissions compare new devices to marketed devices. FDA requests additional information if the relationship between marketed and "predicate" (pre-Amendments or reclassified post-Amendments) devices is unclear.
- ❖❖ This decision is normally based on descriptive information alone, but limited testing information is sometimes required.
- ❖❖❖ Data maybe in the 510(k), other 510(k)s, the Center's classification files, or the literature.

**Premarket Notification [510(k)] Review
Traditional**

K091496/S2

DATE: October 30, 2009

TO: The Record

FROM: Atiq Chowdhury (Biomedical Engineer)

OFFICE: ODE

DIVISION: DSORD

510(K) HOLDER: Midwest RF, LLC

DEVICE NAME: MEP-90 Growth Stimulation System

CONTACT: Helmut Keidl, President

Midwest RF, LLC

1050 Walnut Ridge Drive

Hartland, Wisconsin 53029

Torrance, CA 90505

PHONE: 262-367-8254

FAX: 262-367-8544

EMAIL: helmut@midwestcomposite.com

I. Purpose and Submission Summary:

The 510(k) holder would like to introduce the MEP-90 Growth Stimulation System. Under this submission the sponsor is seeking clearance to market this new device for Prescription Use and as a Class II device. The sponsor is being requested additional information regarding following topics and this submission is being put ON HOLD until they provide the requested information.

- Alternative Data Analysis
- Indications for use
- Statistical Concerns

II. Administrative Requirements

	Yes	No	N/A
Indications for Use page (Indicate if: Prescription or OTC)	X		
Truthful and Accuracy Statement	X		
510(k) Summary or 510(k) Statement	X		
Standards Form	X		

III. Device Description

	Yes	No	N/A
Is the device life-supporting or life sustaining?		X	
Is the device an implant (implanted longer than 30 days)?		X	
Does the device design use software?	X		
Is the device sterile?		X	
Is the device reusable (not reprocessed single use)?	X		
Are "cleaning" instructions included for the end user?			

The sponsor states the device, MEP-90 laser system, is to be used as an adjunctive for treatment of hair loss in women with androgenic alopecia, with Ludwig and Savin hair loss scale classification of I to II and Fitzpatrick skin types I-IV. The MEP-90 system consists of a computer that controls a dome that fits over a subject's head, providing stationary low-level laser equally spread over the entire scalp; this is intended to provide biostimulation, leading to hair growth. It uses a wavelength of 650 nm with a maximum power emission of 3 mW/cm². The sponsor believes that their device is preferable to the predicate for intended use due to the tighter control over the wavelength as well as the ability to expose a larger surface area.

IV. Indications for Use

The indication for use as given in the IFU statement (pg 10) is, "The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for: Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV."

Review of the sponsor's clinical data was found to be not adequate to support these indications for use. Thus, they are being asked to provide a revised clinical study **(See Performance Data—Clinical and Deficiencies)**.

S1 Cycle:

The sponsor's indication for use is not the same as predicate K060305's indications for use, since they claim treatment of females with androgenetic alopecia while predicate K060305's claim for treatment of males. Also, the subject device has an indication for "reduce rate of hair loss in females," where as K060305 does not have a reduce hair loss claim in their indications for use. Thus, they are being asked to either remove the, "reduce rate of hair loss in females claim," or if they decide to pursue this claim, they must provide clinical data.

They are also being asked to address the issue on the apparent discrepancy between the proposed indications for use (allowing concurrent alternative therapies) and the clinical data submitted in support of this proposed indication (which excluded subjects with concurrent alternative therapies **(See Deficiencies)**).

S2 Cycle:

The sponsor has stated that they will comply with providing all necessary clinical data. However, they have no provided sufficient data regarding their “reduce hair loss claim” and “adjunctive use” claims (**See Deficiencies**).

The sponsor has not provided sufficient data regarding their “adjunctive use” claim. It appears that our understanding of the term “adjunctive use” is not the same as the sponsor’s. The Agency uses the term “adjunctive” to mean use in combination with other therapies, where as, they appear to define the term to mean use with the availability of other treatment options. According to our definition of adjunctive to mean use with the combination of other therapies, the term adjunctive needs to be deleted from their Indications for Use since they stated that you have excluded all other therapies during your treatment (**See Deficiencies**).

V. Predicate Device Comparison

The sponsor has listed two predicate devices and is claiming substantial equivalence to them, K060305– Hairmax Lasercomb and K032816 – Quantum Light Therapy System. The sponsor has provided a comparison table in their Substantial Equivalence Section (section pg 36) discussing the similarities of the device and its predicate in the areas of: output energy and wavelengths. However, the sponsor has not provided an adequate Substantial Equivalence Comparison and is being asked to provide a revised SE Comparison Table along with revised Clinical Data which was not found adequate (**See Performance Data—Clinical and Deficiencies**).

S1 Cycle:

It appears the sponsor has misunderstood the question and did not satisfy the requirements of the previous AI Letter. Thus, the sponsor is being asked to provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. They are being asked to include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile) (**See Deficiencies**).

In addition, the subject device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, where as K060305 is a comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

S2 Cycle:

The sponsor has provided a revised Device Comparison Table, on pages 45-48, in the areas of Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. The

Device is a CW Diode Laser, that has a wavelength of 650nm, Output Power of less than or equal to 4.5mw/cm². This is found similar to the predicates and is adequate.

VI. Labeling

The sponsor has provided draft package inserts for device that include necessary safety instructions, warnings, and warranty statements. However, the sponsor's indications may need to be revised pending Substantial Equivalence decision, thus, may alter the Operator's Manual.

VII. Sterilization/Shelf Life/Reuse

The sponsor states that the device will be supplied non sterile and reusable. The sponsor has provided Maintenance instructions for the device (Operator's Manual pg 100). The sponsor states the device may be cleaned with a cloth and mild detergent on the surface. This is found adequate.

VIII. Biocompatibility

The sponsor states (section 15) that the biocompatibility tests were not found applicable since the same patient contacting materials were found in the predicate.

S1 Cycle:

The sponsor has not addressed the biocompatibility issue for the patient contacting materials of the device. Since this is a bonnet type device, there is a strong possibility that the interior materials will come in contact with the individual's scalp. Thus the sponsor is being asked to describe the patient contacting materials of their device, provide biocompatibility tests, or predicates (**See Deficiencies**).

S2 Cycle:

The sponsor has stated on pages 47 and 49 that there are no new materials from predicate K060305 and K032816 in the patient contacting materials. Even though the sponsor has stated that there are no patient contacting materials, that is highly unlikely due to the treatment regime of the bonnet type device. However, since the patient contacting materials are the same as the predicate, this response is found adequate.

IX. Electromagnetic Compatibility and Electrical, Mechanical and Thermal Safety

The sponsor states (pg 38) they complied with IEC 60601-1-2 and to 21 CFR 1040.10. This is found adequate.

X. Performance Testing – Bench

None Provided

XI. Performance Testing – Animal

None Provided

XII. Performance Testing – Clinical

(b)(4)

The sponsor conducted (pg 15-42) a single-arm, non-randomized, un-blinded clinical trial to determine the safety and effectiveness of the MEP-90 laser for this indication. The protocol does not appear to have received prior FDA review, but was conducted under IRB approval and supervision (by Western IRB). The primary investigator's CV and website suggests that he has three clinical sites: one in Pennsylvania and two in North Carolina - it is unclear whether subjects were enrolled at only one of these sites or at all three.

Pivotal trial design:

The pivotal trial treated enrolled women with 36 20-minute treatment sessions over an 18 week period. Assessments were made at weeks 10 and 18. To be eligible for the trial, female subjects were screened for Ludwig and Savin hair loss scale classification of I to II, Fitzpatrick skin types I-IV, and a diagnosis of androgenic alopecia.

The primary endpoint was a responder analysis, with two co-primary hypotheses:

- After 20 treatments (week 10) $\geq 50\%$ of subjects demonstrated an increased hair count of $\geq 10\%$
- After 36 treatments (week 18) $\geq 50\%$ of subjects demonstrated an increased hair count of $\geq 20\%$ and/or a reduction in the rate of hair loss.

The trial had several secondary endpoints (impact on existing hair, stabilization of hair loss, impact on hair growth cycle) but as these were not clearly defined, and are not associated with any hypothesis tests, the results of the secondary endpoints will not be presented in this memo.

A total of 157 women were screened, with 82 being enrolled. The sponsor removed 19 subjects due to dropout (4), an excessive number of missed appointments (13), incorrect diagnoses (1) and a subject who decided to become pregnant before the end of the trial (1) for a final total of 63 subjects at the 10 week assessment and 60 at the 18 week assessment. The study population was primarily Caucasian (69%) and African American (27%); the remaining 4% were Hispanic (2%) and Other (2%).

(b)(4)

application is inadequate.

S1 Cycle:

The sponsor responded with a letter which suggested that these comments were inappropriate, accusatory, and overall reflective of a non-objective evaluation of the submission. They further escalated the review to the CDRH Ombudsman, Les Weinstein. However, they have provided their Hair Count Methodology and Hair Count Data for individual patients.

The sponsor's response was reviewed by Richard Felten (DSORD/GSDB) and the Statistics by Scott Miller (DBS/GSDB) (See Attached Memos).

Richard Felten discussed several issues, the ones of importance:

1. Is a placebo treated arm required for low level light therapy or can the individual's baseline acts as control with change from baseline being the success criteria?

2. Is the method used to count hair acceptable? I have read this several times but still do not have a clear idea of exactly how the counts were performed. It appears that the head was divided into quarters with multiple photographs being taken of each quarter. But there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. The photograph I have on my copy on page 27 does not show this very well. What I am not sure of is what is meant by the count photo, I thought all photos were being counted. Also, this section seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Depending on how this process is interpreted it seems that for each individual, upto 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. We need to discuss this methodology.

Scott Miller's Summary:

- (b)(4)
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(b)(4)

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(b)(4)

(b)(4)

Scott Miller's complete comments to the sponsor were limited to just the alternative analysis approach in order to move forward with the given clinical study. Miller was contacted by (E-mail 10/31/09) to approve the decision in which he complied.

XIII. Software

The sponsor states that this device has a moderate level of concern.

Version:		
Level of Concern: Minor		
	Yes	No
Software description:	X	
Device Hazard Analysis:	X	
Software Requirements Specifications:	X	
Architecture Design Chart:		X
Software Design Specifications:		X
Traceability Analysis/Matrix:	X	
Software Development:		X
Verification & Validation Testing:	X	
Revision level history:	X	

Unresolved anomalies:		
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All software sections contained within this submission are found to be acceptable documentation of the software and meet the software concerns as described in the FDA Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices, dated May 29, 1998.

XIV. Substantial Equivalence Discussion

	Yes	No	
1. Same Indication Statement?			If YES = Go To 3
2. Do Differences Alter The Effect Or Raise New Issues of Safety Or Effectiveness?			If YES = Stop NSE
3. Same Technological Characteristics?			If YES = Go To 5
4. Could The New Characteristics Affect Safety Or Effectiveness?			If YES = Go To 6
5. Descriptive Characteristics Precise Enough?			If NO = Go To 8 If YES = Stop SE
6. New Types Of Safety Or Effectiveness Questions?			If YES = Stop NSE
7. Accepted Scientific Methods Exist?			If NO = Stop NSE
8. Performance Data Available?			If NO = Request Data
9. Data Demonstrate Equivalence?			Final Decision: AI

XIV. Responses to Deficiencies

1. Substantial Equivalence – Revised Device Comparison Table

In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm²), Pulse Duration (µs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

Reviewer's Comments:

It appears the sponsor has misunderstood the question and did not satisfy the requirements of the previous AI Letter. Thus, the sponsor is being asked to provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of

Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. They are being asked to include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile) (See Deficiencies).

2. (b)(4)

At this time an adequate review of this application from a clinical perspective is not possible. Without having a placebo control arm for comparison and not having evidence that there was randomization between treated and placebo control, the data provided in this application is inadequate.

Please provide data from a placebo control, randomized clinical study to support your requested indications for use.

Reviewer's Comments:

(b)(4)

The following Additional Questions involve the Statistical Concerns of the submission:

Please provide a revised clinical study which addresses the following concerns:

- There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being

performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.

- A large proportion of subjects screened were not accepted (82 accepted out of 157 screened.) It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

(b)(4)

- The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

(b)(4)

- The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

Reviewer's Comments:

Please refer to Statistician's Review Memo, Scott W. Miller (DBS, GSDB), for comments.

XV. Responses to Deficiencies (S1)

1. Substantial Equivalence – Revised Device Comparison Table

In our previous AI Letter Dated July 22, 2009 under Deficiency #1, there was a typo. Originally it stated:

"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."

It should have stated:

*"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have **not provided an adequate** comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."*

Regardless, in your answer to that deficiency, it appears that you have misunderstood the question. The Substantial Equivalence section must contain a stand-alone comparison of your device's technological characteristics along with other pertinent information compared to the predicates. That information is not referred to other sections, but provided in this section as a quick summary/comparison to the predicates. Thus, the deficiency above is asking to provide a Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

- A. Please provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. Also, please include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile).

Comments Regarding Your Response to Deficiency #1:

- In your response dated August 18, 2009 on page 6, your comments regarding the Indications for Use comparison, you refer to a bulleted list which points out similarities between the subject device and the predicates. This does not satisfy the requirements of what the original AI Letter asked, "compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement)." Thus, please revise your Device Comparison Table that includes a comparison of your device to the predicates in the area of: Indications of Use (which is reflective of the Indications for Use Statement).
- The Energy Range comparison you have provided is regarded as the power density. This comparison was found adequate. Please include them in your revised Device Comparison Table.

Reviewer's Comments:

The sponsor has provided a revised Device Comparison Table, on pages 45-48, in the areas of Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. The Device is a CW Diode Laser, that has a wavelength of 650nm, Output Power of less than or equal to 4.5mw/cm². This is found similar to the predicates and is adequate.

2. Biocompatibility

You have not addressed the biocompatibility issue for the patient contacting materials of your device. Since this is a bonnet type device, there is a strong possibility that the interior materials will come in contact with the individual's scalp.

- Please describe the patient contacting materials of your device.
- Please provide the biocompatibility test results of your patient contacting materials, or provide predicates.

Reviewer's Comments:

The sponsor has stated on pages 47 and 49 that there are no new materials from predicate K060305 and K032816 in the patient contacting materials. Even though the sponsor has stated that there are no patient contacting materials, that is highly unlikely due to the treatment regime of the bonnet type device. However, since the patient contacting materials are the same as the predicate, this response is found adequate.

The following Statistical Comments are in regards to your Response to our AI Letter Dated July 22, 2009:

Comment 1: There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the

possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.

You responded that a requirement to submit a double-blind, sham-control, randomized clinical trial is inappropriate and not reflective of the "least burdensome" requirements. You also state that this is a conclusion "not based on science, statistics, FDA regulations, or the contents of our 510(k) submission." You further state (without providing justification or elaboration) that the disease is such that a double-blind study "could lead to improper estimations."

This comment was not intended to suggest that an entirely new, randomized controlled trial would be necessary before it would be possible to evaluate this submission. It was a comment meant to convey that the fact that there was not a concurrent control arm in the trial data submitted suggests that there are potential difficulties in the evaluation of the clinical data presented. Randomized controlled trials are recognized as the gold standard of clinical research. However, as the sponsor states, FDA's least burdensome approach does recognize that there are situations where such a trial is impossible or unduly burdensome on the sponsor or patients, and states that alternative study designs are acceptable. Nevertheless, these alternative trial designs are more susceptible to certain types of bias than a randomized controlled trial. The data and description of the trial submitted for review were obtained from a single arm, un-blinded trial, wherein both the clinical staff administering the treatment as well as the patients receiving treatment were aware of the fact that there was an active treatment involved. It is possible that such knowledge affected other behaviors of the patients and/or clinical staff in a way which could affect hair growth or rate of hair loss. For example, patients may have combed, washed, styled, etc. their hair in a different way than normal as a result of being in the trial. If there were a concurrent control arm, with subjects and possibly clinical staff blinded to the treatment assigned, then this potential could be evaluated and its possible effect separated from the effect of the investigational device. In the absence of such a control, it can not. This does not negate the value of the data obtained from this trial, it simply points out that the absence of a concurrent control arm makes it difficult to conclusively rule out such possibilities.

(b)(4)

¹ Guidance for Industry: E9 Statistical principles for clinical trials. FDA, 1998.
<http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm073137.pdf>

medical staff who are not involved in treating subjects and who remain blind to treatment.”

To quote from Piantadosi “investigators often underestimate the value of treatment and assessment masking. There is a tendency to believe that biases are small in relation to the magnitude of treatment effects (when, in fact, the converse is usually true) or that practitioners can compensate for their prejudice and subjectivity”².

Comment 2: (a) A large proportion of subjects screened were not accepted (82 accepted out of 157 screened). It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. (b) In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. (c) It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, (d) in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

(b)(4)

You appear to have misunderstood the point of this comment. It did not state that you had intentionally “deliberately” overestimated the effectiveness of the device. It did, however, raise some valid concerns regarding the recruitment and retention of subjects into the trial, as well as the handling of missing data.

(a) (b)(4)

(b)

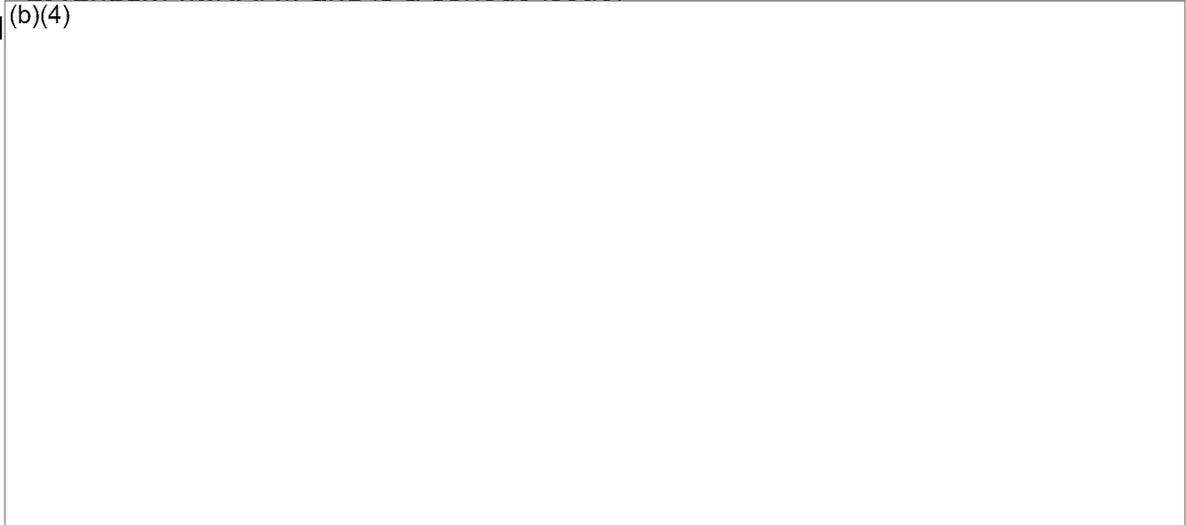
² S. Piantadosi. Clinical trials: a methodologic perspective. 1997. Wiley, New York.

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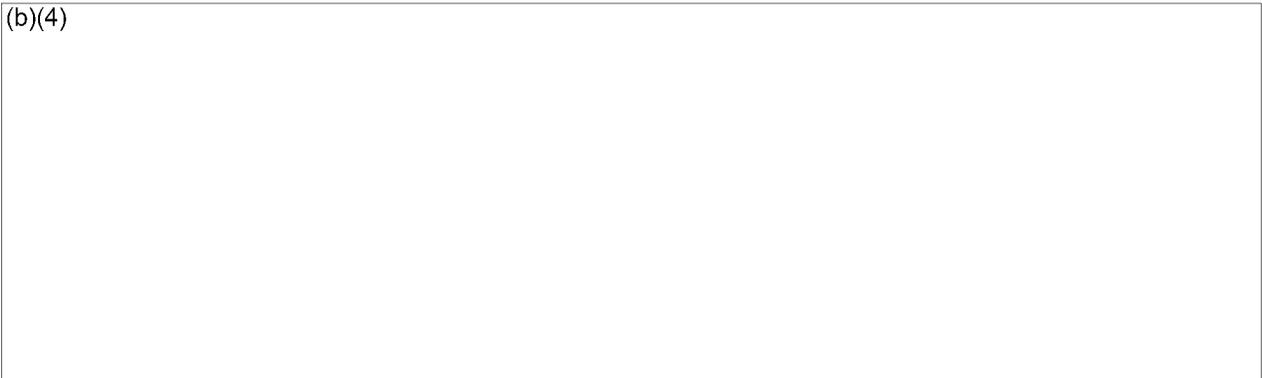
principle, which would have involved some method of accounting for the subjects who were enrolled into the trial but did not complete it. This issue is discussed further regarding point (d).

- (c) Some of the subjects were excluded for reasons such as “excessive number of missed appointments.” While it is true that including such patients in the analysis would tend to attenuate the estimated treatment effect, this is what is likely to occur in everyday practice should the device be approved and marketed. It is possible that some of these women stopped attending appointments due to a perceived lack of effectiveness. Indeed, this is not merely speculation, as I would refer to the following quote on page 26 of your response: “Anecdotal statements such as ‘I would never have continued this for six months if it wasn't working’ became the slogan of the study”. This implies that at least some subjects would have considered dropping out of the study for a perceived lack of effectiveness. The possibility that subjects with missing data are not a random sample of the study population, but that they may have dropped for a reason related to their (unobserved) missing outcome data is referred to as missing not at random (MNAR), and is a serious issue.

(d) (b)(4)



(b)(4)



³ Statistical guidance for clinical trials of non-diagnostic medical devices. FDA, 1996.
<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm106757.htm>

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Section V, part D (5.4) discusses follow-up. Specifically “completeness is defined as the proportion of patients entering the trial who come back for each and every follow-up appointment. It is extremely important that this proportion be as close to 100% as possible...follow-up percentages of less than 80% are generally considered poor and these trials are labeled incomplete.” Further, “incomplete follow-up is a major concern in analysis. The trial must have procedures available to trace subjects who fail to appear for scheduled follow-up. Accounting for subjects lost to follow-up is a critical analytical issue because those patients may provide the most important information from the clinical trial, particularly if the outcome in such patients is poor.”

(b)(4)

The intent to treat concept is further discussed in Section V, part B (5.2.1) “the intention-to-treat principle implies that the primary analysis should include all randomized subjects.” Further on “there are a limited number of circumstances that might lead to excluding randomized subjects from the full analysis set, including the failure to satisfy major entry criteria (eligibility requirements), the failure to take at least one dose of trial medication, and the lack of any data post-randomization.” It goes on to specify the circumstances these exclusions should satisfy. It then states, “special problems arise in connection with subjects withdrawn from treatment after receiving one or more doses who provide no data after this point, and subjects otherwise lost to follow-up, because failure to include these subjects in the full analysis set may seriously undermine the approach.” In Section V, part C (5.3) it elaborates on missing data “missing values represent a potential source of bias in a clinical trial...an investigation should be made concerning the sensitivity of the results of analysis to the method of handling missing values, especially if the number of missing values is substantial.”

Comment 3: The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.

You responded that you felt that submitting a rigorous definition of how the primary endpoint of hair count was determined was not required for an initial 510(k) submission. Nevertheless, you went on to provide a detailed, several page description of this process.

The information provided adequately addresses the statistical reviewer's concerns on this point.

The reason this information was requested is that the primary endpoint of a clinical trial is an extremely important aspect of the trial; all aspects of the trial should revolve around it. As the submitted trial was an un-blinded, non-randomized, single-arm trial, it

(b)(4)

“the study population should be a representative subset of the population targeted for the application of the medical device.”³

Indeed, the E9 guideline states that one of the two main reasons for multicenter trials is to “provide a better basis for the subsequent generalization of its findings. This arises from the possibility of recruiting subjects from a wider population and of administering the medication in a broader range of clinical settings, thus presenting an experimental situation that is more typical of future use.”

The following are deficiencies regarding the Clinical and Statistical Concerns of the submission:

3 (b)(4)

Your device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, where as K060305 is a comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

- Regarding your reduce rate of hair loss in females claim, this indication for use must be removed or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual’s normal rate of loss before treatment in order to show an effect on the rate of loss.

Reviewer’s Comments:

(b)(4)

4. Clinical Protocol Package

Please provide the entire clinical protocol package which includes the statistical success hypothesis used in this clinical study.

Reviewer's Comments:

The sponsor has provided the entire clinical protocol package which states the statistical success hypothesis used in this clinical study. This is found adequate.

5. Indications for Use Clarification

The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

Your response points out that concurrent alternative therapy was an exclusion criterion of the trial.

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In the absence of any clinical data on subjects treated with concurrent therapy, it is extremely difficult for FDA to evaluate the appropriateness of this proposed indication for use. The only clinically valid interpretation possible would be that the device is safe and effective when used as a monotherapy. There is no data to support its use in addition to other treatments, which may alter the safety and / or effectiveness of the investigational device.

- Please address this issue, given that the study population (women not using concurrent therapy) appears to be different from the intended target population (women who may or may not be using concurrent therapy).

Reviewer's Comments:

The sponsor has not provided sufficient data regarding their "adjunctive use" claim. It appears that our understanding of the term "adjunctive use" is not the same as the sponsor's. The Agency uses the term "adjunctive" to mean use in combination with other therapies, where as, they appear to define the term to mean use with the availability of other treatment options. According to our definition of adjunctive to mean use with the combination of other therapies, the

term adjunctive needs to be deleted from their Indications for Use since they stated that you have excluded all other therapies during your treatment (See Deficiencies).

6. Clarification on Data Sets

The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

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This question regards the issue of analysis datasets. Virtually every clinical trial submitted for FDA review clearly delineates multiple analysis datasets. These typically consist of:

- A safety dataset, used for adverse event analysis and consisting of all subjects enrolled in the trial.
- A full analysis or intent to treat dataset, used for the primary effectiveness analysis and consisting of all subjects randomized to receive treatment.
- A per protocol dataset, used to replicate the primary effectiveness analysis and consisting of all subjects in the intent to treat dataset who meet pre-defined protocol adherence criteria.

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effectiveness analysis.) It is unclear whether these subjects were ever treated or not.

As stated in the E9 guideline "the protocol should also specify procedures aimed at minimizing any anticipated irregularities in study conduct that might impair a satisfactory analysis, including various types of protocol violations, withdrawals, and missing values" (Section V, part B (5.2))

- Please clarify which subjects were assessed in the safety analysis; e.g., all screened subjects, all enrolled subjects, all subjects who were evaluated at the first assessment, all subjects who were evaluated at the second assessment, etc.

Reviewer's Comments:

(b)(4)

7. Clarification on Hair Count Method

From your explanation of your hair count method beginning on page 25 of your response to our AI Letter Dated July 22, 2009, it appears that the head was divided into quarters with multiple photographs being taken of each quarter. But on page 26, there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. It is unclear what is meant by the phrase "count photo," since it appears all photos were being counted. In addition, this method seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Thus, depending on how this process is interpreted it seems that for each individual, up to 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. If this assumption is correct, what method was used to insure that baseline and follow-up photographs were identical in terms of scalp area viewed within each photograph. Please provide clarification on your Hair Count Method.

Reviewer's Comments:

The sponsor has a detailed explanation on their hair-count methodology on pages 42-44. This issue of whether the fixation of the head would play a role on each hair count was satisfied since the manner in which the hairs are counted are done by taking an image perpendicular to the desired location. This was found adequate.

XVI. Deficiencies

1. (b)(4)

2. Indications for Use—Reduce Hair Loss and Adjunctive Use Claims

Your proposed indications for use, “Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV,” are not the same as predicate K060305’s indications for use. Your claims for “adjunctive use for the treatment of androgenic alopecia in females” and “reduce rate of hair loss in females,” are not found in predicate K060305.

- Adjunctive use for the treatment of androgenic alopecia in females:

i.

(b)(4)

Indications for Use since you stated that you have excluded all other therapies during your treatment.

- Reduce Rate of hair loss in females:

i. (b)(4)

XVII. Contact History

07/22/2009 – An email sent to the sponsor regarding the request for AI.

09/02/2009 – A meeting was set up with CDRH Ombudsman, Les Weinstein.

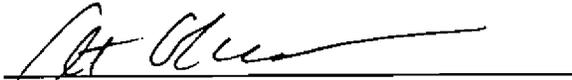
Meeting attendees included Atiq Chowdhury (DSORD/GSDB), Neil Ogden (DSORD/GSDB), and Scott Miller (DBS/GSDB). It was concluded that the review would continue and the sponsor would be notified by next AI Letter and a teleconference would be set up.

09/10/2009 - An email sent to the sponsor regarding the request for AI and to arrange teleconference.

10/31/2009 – An email sent to the sponsor regarding the request for AI.

XVIII. Recommendation

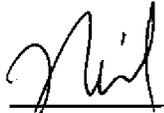
I recommend that this submission be placed on hold pending the receipt of the response to the above questions.



Reviewer
Atiq Chowdhury
Biomedical Engineer
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

10/30/09

Date

 *F lower with AF.*

Branch Chief
Neil Ogden
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

11/2/09

Date



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Food and Drug Administration

MEMORANDUM

(b)(4)

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(b)(4)

The sponsor responded that the trial was conducted at a single site in North Carolina. They then stated that the disease in question (androgenic alopecia) is a genetic disorder in women. As a result, geographical issues are not relevant, and the device would have had the same effect at any clinical center, so a multi-center trial is not needed.

This justification sounds reasonable; I defer to the clinical reviewer to comment more generally on this point.

(b)(4)

Page 8, paragraph 2: ICH-E9 guidelines recommend that the study population should mirror the intended target population.

The sponsor states that the 510(k) process relies on a less rigorous level of evidence than a PMA submission, as it only requires a finding of SE to the predicate, which the sponsor claims has been demonstrated.

This may be true, but if clinical data is required for a 510(k), it still needs to be valid scientific evidence.

(b)(4)

Page 9, paragraph 2: Indications for use claim “reduction in rate of hair loss” but no clinical data is provided in support of this claim. This needs to be removed or clinical data provided, which would require a non-treatment “run-in” phase to estimate the baseline rate of hair loss. [Lead reviewer’s comment but I agree].

The sponsor argues that it is not possible to estimate a rate of hair loss. They further state that they do not dispute submitting data, but dislike the expectation of a “run-in” phase, which they argue is “incorrect, prejudicial, subjective, and an erroneous demand that has no basis in medical fact or relativity to the disease of androgenic alopecia.”

I would counter that it is inappropriate to make a marketing claim that the device can “reduce the rate of hair loss” if the sponsor can not measure a baseline rate of hair loss to use in demonstrating evidence of such a claim.

They then provide another recitation of their results. Including results from phase 3 (26 weeks) which had 55 total subjects: 3 were excluded for missing excessive appointments, 1 dropout for pregnancy attempt, and 1 for moving outside range of trial. The sponsor provides earlier data suggesting these were all successful.

Page 9, paragraph 3: Please provide the entire protocol and the statistical success hypothesis. The sponsor has provided this in pages 51-85 of their response. The protocol is more detailed than what I reviewed in the first submission.

Page 9, paragraph 4: The study population [treatment used as a monotherapy] does not match the anticipated indications for use [device used as an adjuvant].

The sponsor responded that they are offended by this contradictory statement and feel that it raises concerns over the objectivity of the review. They also state that this creates a “catch-22” because they should only have to demonstrate SE to the predicate device, and ruling out other therapies was the only way to get an unbiased estimate of the effectiveness of their device. The study population should mirror the proposed indications for use for the target population; this seems like a fairly straight-forward issue. There is absolutely **no** clinical evidence of safety or effectiveness in patients using additional treatments. I defer to the clinical reviewer regarding whether this is important for limiting the proposed labeling.

Page 10, paragraph 3-6: Uncertainty as to which subjects were assessed for safety / adverse events.

The sponsor is upset that we asked this, but clarified that they did not limit the assessment of AEs to completers, but contacted subjects who dropped out to ask about reasoning and/or problems.

This is acceptable, and adequately addresses this question.

Page 11, paragraph 4: Request for further clarification of hair count method

The sponsor has presented a more detailed description of the hair count method.

Throughout, the sponsor makes a distinction between a “clinical trial” which they say is for a PMA submission, and what they performed for the 510(k), an “experimental study.”

3. Intended for sponsor

Your response has clarified several issues not previously clear from the initial submission. Several of the arguments provided are reasonably convincing (e.g. regarding the nature of the disease making a multi-center trial unlikely to provide additional information beyond that from a single-center trial). Others are not (e.g. the justification for not including some sort of control

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To briefly re-address the points raised in the most recent response letter:

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(b)(4)

4. Conclusions

Overall, the sponsor's responses continue to be muddled, argumentative, and accusatory. Their responses appear not to understand that these are relevant issues, and further discussions with them are unlikely to change that.

In light of the recent review team discussion regarding this most recent response letter, the subsample re-count appears to be the best option to move forward. It is unlikely that the sponsor would agree to conduct a more appropriately designed clinical trial to address the review teams concerns. Requesting them to do so may not be least burdensome given that this is a relatively low risk class II device intended for use under physician observation. Further, the device appears to be relatively safe and may be as or more effective than the predicates. As a result, the subsample re-count should address whether the observed hair growth is over-estimated due to un-blinded assessments by a reviewer who was potentially aware of the subject's identity and temporal order of the photos. It will also provide some estimate of the variability associated with the initial hair counts.

If you have any questions, please contact me at (301)-796-6019 or Scott.Miller@fda.hhs.gov.

Scott W. Miller, PhD

CC:

Jianxiong (George) Chu, WO66-2104

Phyllis Silverman, WO66-2226

Richard Felten, WO66-1436

DBS Reviews

Chowdhury, Atiq

From: Miller, Scott
Sent: Saturday, October 31, 2009 9:33 AM
To: Chowdhury, Atiq
Cc: Felten, Richard P.
Subject: RE: K091496

(b)(4)

From: Chowdhury, Atiq
Sent: Friday, October 30, 2009 5:02 PM
To: Miller, Scott
Cc: Felten, Richard P.
Subject: K091496

(b)(4)

October 30, 2009

Helmut Keidl
President
Midwest RF, LLC, Hartland, WI 53029
Ph#: 262-367-8254
Fax#: 262-367-8544
e-mail: helmut@midwestcomposite.com

Re: 510(k) submission – MEP-90 Growth Stimulation System (K091496)

Dear Mr. Helmut Keidl,

In reviewing the subject submission, we have the following additional questions that need to be clarified to facilitate our review process:

1. Alternative Data Analysis

The Agency still finds serious limitations with the data you have submitted. Short of conducting an entirely new trial designed to better minimize these concerns, the following is suggested as an alternative. Please consider taking a random sample of the subjects in the trial (at least 50%). Have three individuals re-count the hair growth for these subjects in such a way that they are unaware of the previous hair counts, the other re-counters' hair counts, any patient identifiers, or the time-point of assessment (e.g. baseline, 10 week follow-up, 18 week follow-up, etc.). This could be achieved by collecting all photographs used in determining the hair count for these subjects, and de-identifying them (by assigning each subject / time-point photo some unique identifier via a system not accessible to the counters, then presenting them in some random fashion such that subject identity and time are not known or inferred by the counters.) If the revised counts for this subsample of the data were in relatively good agreement with the original counts, it would provide some assurance to rule out the possibility of an over-estimation of hair counts due to a single, un-blinded investigator. It would also provide some estimate of the variability associated with the initial hair counts.

2. Indications for Use—Reduce Hair Loss and Adjunctive Use Claims

Your proposed indications for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," are not the same as predicate K060305's indications for use. Your claims for "adjunctive use for the treatment of androgenic alopecia in females" and "reduce rate of hair loss in females," are not found in predicate K060305.

- Adjunctive use for the treatment of androgenic alopecia in females:
 - You responded on Page 9, paragraph 4 that you are offended by this contradictory statement and feel that it raises concerns over the objectivity of the review. It appears that our understanding of the term “adjunctive use” is not the same as yours. The Agency uses the term “adjunctive” to mean use in combination with other therapies, where as, you appear to define the term to mean use with the availability of other treatment options. According to our definition of adjunctive to mean use with the combination of other therapies, the term adjunctive needs to be deleted from your Indications for Use since you stated that you have excluded all other therapies during your treatment.

- Reduce Rate of hair loss in females:
 - Your response on Page 9, paragraph 2 states that it is not possible to estimate a rate of hair loss. In addition, evidence of hair growth does not necessarily support prevention of hair loss since the number of hairs being counted could be the result of new hair growth minus continued hair loss. Please remove your “reduce hair loss” claim, or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

The subject submission will be placed on hold pending your response with the requested information. If you need more than 30 days to provide a full and complete response, you should submit a request for an extension of time to Document Mail Center (HFZ 401). For further information on how to apply for an extension and for general 510(k) information, please visit the FDA Website at: http://www.fda.gov/cdrh/devadvice/31435.html#link_6

Sincerely,

Atiq Chowdhury
Biomedical Engineer
(301)796-6391
GSDB/DSORD/ODE/FDA
atiq.chowdhury@fda.hhs.gov



COVER SHEET MEMORANDUM

From: Reviewer Name Atig (Kowidhy)
 Subject: 510(k) Number K091496/S
 To: The Record

- Please list CTS decision code A7
- Refused to accept (Note: this is considered the first review cycle, See Screening Checklist http://eroom.fda.gov/eRoomReg/Files/CDRH3/CDRHPremarketNotification510kProgram/0_5631/Screening%20Checklist%207%202%2007.doc)
 - Hold (Additional Information or Telephone Hold).
 - Final Decision (SE, SE with Limitations, NSE, Withdrawn, etc.).

Please complete the following for a final clearance decision (i.e., SE, SE with Limitations, etc.):		YES	NO
Indications for Use Page	Attach IFU	/	/
510(k) Summary /510(k) Statement	Attach Summary	/	/
Truthful and Accurate Statement.	Must be present for a Final Decision	/	/
Is the device Class III? If yes, does firm include Class III Summary?	Must be present for a Final Decision		/
Does firm reference standards? (If yes, please attach form from http://www.fda.gov/opacom/morechoices/fdaforms/FDA-3654.pdf)			/
Is this a combination product? (Please specify category _____, see http://eroom.fda.gov/eRoomReg/Files/CDRH3/CDRHPremarketNotification510kProgram/0_413b/COMBINATION%20PRODUCT%20ALGORITHM%20(REVISED%203-12-03).DOC)			/
Is this a reprocessed single use device? (Guidance for Industry and FDA Staff – MDUFMA - Validation Data in 510(k)s for Reprocessed Single-Use Medical Devices, http://www.fda.gov/cdrh/ode/guidance/1216.html)			/
Is this device intended for pediatric use only?			/
Is this a prescription device? (If both prescription & OTC, check both boxes.)		/	/
Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank?			/
Is clinical data necessary to support the review of this 510(k)? Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank? (If not, then applicant must be contacted to obtain completed form.)			/
Does this device include an Animal Tissue Source?			/
All Pediatric Patients age <=21			/
Neonate/Newborn (Birth to 28 days)			/
Infant (29 days -< 2 years old)			/
Child (2 years -< 12 years old)			/
Adolescent (12 years -< 18 years old)			/
Transitional Adolescent A (18 - <21 years old) Special considerations are being given to this group, different from adults age ≥ 21 (different device design or testing, different protocol procedures, etc.)			/

Transitional Adolescent B (18 -<= 21; No special considerations compared to adults => 21 years old)		
Nanotechnology		
Is this device subject to the Tracking Regulation? (Medical Device Tracking Guidance, http://www.fda.gov/cdrh/comp/guidance/169.html)	Contact OC.	

Regulation Number

Class*

Product Code

890,5500

II

OAP

(*If unclassified, see 510(k) Staff)

Additional Product Codes:

Review:

Neil R. Polan

(Branch Chief)

6303

(Branch Code)

9/11/09

(Date)

Final Review:

(Division Director)

(Date)

**Premarket Notification [510(k)] Review
Traditional**

K091496/S1

DATE: September 10, 2009

TO: The Record

FROM: Atiq Chowdhury (Biomedical Engineer)

OFFICE: ODE

DIVISION: DSORD

510(K) HOLDER: Midwest RF, LLC

DEVICE NAME: MEP-90 Growth Stimulation System

CONTACT: Helmut Keidl, President

Midwest RF, LLC

1050 Walnut Ridge Drive

Hartland, Wisconsin 53029

Torrance, CA 90505

PHONE: 262-367-8254

FAX: 262-367-8544

EMAIL: helmut@midwestcomposite.com

I. Purpose and Submission Summary:

The 510(k) holder would like to introduce the MEP-90 Growth Stimulation System. Under this submission the sponsor is seeking clearance to market this new device for Prescription Use and as a Class II device. The sponsor is being requested additional information regarding following topics and this submission is being put ON HOLD until they provide the requested information.

- Substantial Equivalence – Device Comparison Table
- Substantial Equivalence – Clinical Data
- Indications for use
- Statistical Concerns

II. Administrative Requirements

	Yes	No	N/A
Indications for Use page (Indicate if: Prescription or OTC)	X		
Truthful and Accuracy Statement	X		
510(k) Summary or 510(k) Statement	X		
Standards Form	X		

III. Device Description

	Yes	No	N/A
Is the device life-supporting or life sustaining?		X	
Is the device an implant (implanted longer than 30 days)?		X	
Does the device design use software?	X		
Is the device sterile?		X	
Is the device reusable (not reprocessed single use)?	X		
Are "cleaning" instructions included for the end user?			

The sponsor states the device, MEP-90 laser system, is to be used as an adjunctive for treatment of hair loss in women with androgenic alopecia, with Ludwig and Savin hair loss scale classification of I to II and Fitzpatrick skin types I-IV. The MEP-90 system consists of a computer that controls a dome that fits over a subject's head, providing stationary low-level laser equally spread over the entire scalp; this is intended to provide biostimulation, leading to hair growth. It uses a wavelength of 650 nm with a maximum power emission of 3 mW/cm². The sponsor believes that their device is preferable to the predicate for intended use due to the tighter control over the wavelength as well as the ability to expose a larger surface area.

IV. Indications for Use

The indication for use as given in the IFU statement (pg 10) is, "The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for: Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV."

Review of the sponsor's clinical data was found to be not adequate to support these indications for use. Thus, they are being asked to provide a revised clinical study (**See Performance Data—Clinical and Deficiencies**).

S1 Cycle:

The sponsor's indication for use is not the same as predicate K060305's indications for use, since they claim treatment of females with androgenetic alopecia while predicate K060305's claim for treatment of males. Also, the subject device has an indication for "reduce rate of hair loss in females," where as K060305 does not have a reduce hair loss claim in their indications for use. Thus, they are being asked to either remove the, "reduce rate of hair loss in females claim," or if they decide to pursue this claim, they must provide clinical data.

They are also being asked to address the issue on the apparent discrepancy between the proposed indications for use (allowing concurrent alternative therapies) and the clinical data submitted in support of this proposed indication (which excluded

subjects with concurrent alternative therapies (**See Deficiencies**).

V. Predicate Device Comparison

The sponsor has listed two predicate devices and is claiming substantial equivalence to them, K060305– Hairmax Lasercomb and K032816 – Quantum Light Therapy System. The sponsor has provided a comparison table in their Substantial Equivalence Section (section pg 36) discussing the similarities of the device and its predicate in the areas of: output energy and wavelengths. However, the sponsor has not provided an adequate Substantial Equivalence Comparison and is being asked to provide a revised SE Comparison Table along with revised Clinical Data which was not found adequate (**See Performance Data—Clinical and Deficiencies**).

S1 Cycle:

It appears the sponsor has misunderstood the question and did not satisfy the requirements of the previous AI Letter. Thus, the sponsor is being asked to provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. They are being asked to include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile) (**See Deficiencies**).

In addition, the subject device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, where as K060305 is a comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

VI. Labeling

The sponsor has provided draft package inserts for device that include necessary safety instructions, warnings, and warranty statements. However, the sponsor's indications may need to revised pending Substantial Equivalence decision, thus, may alter the Operator's Manual.

VII. Sterilization/Shelf Life/Reuse

The sponsor states that the device will be supplied non sterile and reusable. The sponsor has provided Maintenance instructions for the device (Operator's Manual pg 100). The sponsor states the device may be cleaned with a cloth and mild detergent on the surface. This is found adequate.

VIII. Biocompatibility

The sponsor states (section 15) that the biocompatibility tests were not found applicable since the same patient contacting materials were found in the predicate. This is found adequate.

S1 Cycle:

The sponsor has not addressed the biocompatibility issue for the patient contacting materials of the device. Since this is a bonnet type device, there is a strong possibility that the interior materials will come in contact with the individual's scalp. Thus the sponsor is being asked to describe the patient contacting materials of their device, provide biocompatibility tests, or predicates (**See Deficiencies**).

IX. Electromagnetic Compatibility and Electrical, Mechanical and Thermal Safety

The sponsor states (pg 38) they complied with IEC 60601-1-2 and to 21 CFR 1040.10. This is found adequate.

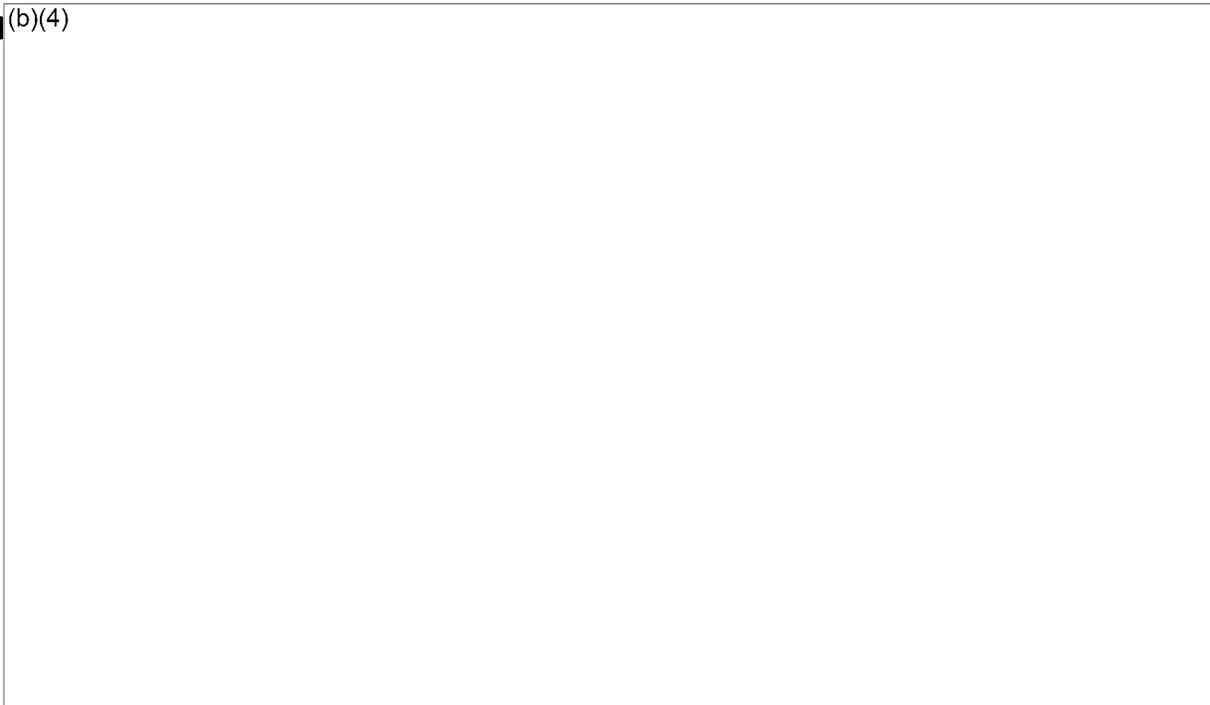
X. Performance Testing – Bench

None Provided

XI. Performance Testing – Animal

None Provided

XII (b)(4)



The primary endpoint was a responder analysis, with two co-primary hypotheses:

- After 20 treatments (week 10) $\geq 50\%$ of subjects demonstrated an increased hair count of $\geq 10\%$

- After 36 treatments (week 18) $\geq 50\%$ of subjects demonstrated an increased hair count of $\geq 20\%$ and/or a reduction in the rate of hair loss.

The trial had several secondary endpoints (impact on existing hair, stabilization of hair loss, impact on hair growth cycle) but as these were not clearly defined, and are not associated with any hypothesis tests, the results of the secondary endpoints will not be presented in this memo.

A total of 157 women were screened, with 82 being enrolled. The sponsor removed 19 subjects due to dropout (4), an excessive number of missed appointments (13), incorrect diagnoses (1) and a subject who decided to become pregnant before the end of the trial (1) for a final total of 63 subjects at the 10 week assessment and 60 at the 18 week assessment. The study population was primarily Caucasian (69%) and African American (27%); the remaining 4% were Hispanic (2%) and Other (2%).

(b)(4)

S1 Cycle:

The sponsor responded with a letter which suggested that these comments were inappropriate, accusatory, and overall reflective of a non-objective evaluation of the submission. They further escalated the review to the CDRH Ombudsman, Les Weinstein. However, they have provided their Hair Count Methodology and Hair Count Data for individual patients.

The sponsor's response was reviewed by Richard Felten (DSORD/GSDB) and the Statistics by Scott Miller (DBS/GSDB) (See Attached Memos).

Richard Felten discussed several issues, the ones of importance:

1. Is a placebo treated arm required for low level light therapy or can the individual's baseline acts as control with change from baseline being the success criteria?
2. Is the method used to count hair acceptable? I have read this several times but still do not have a clear idea of exactly how the counts were performed. It appears that the head was divided into quarters with multiple photographs being taken of each quarter. But there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that

could be traced to a root. The photograph I have on my copy on page 27 does not show this very well. What I am not sure of is what is meant by the count photo, I thought all photos were being counted. Also, this section seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Depending on how this process is interpreted it seems that for each individual, upto 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. We need to discuss this methodology.

Scott Miller's Summary:

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In short, the data submitted so far do not currently provide sufficiently convincing evidence in support of a determination of the safety and effectiveness of the investigational device for its proposed indication for use in the target population. Contrary to the sponsor's apparent belief that these are subjective questions which have no bearing on the establishment of the safety and effectiveness of their investigational device, they are based upon well-established statistical and regulatory recommendations, as evidenced by their liberal citation in this response.

XIII. Software

The sponsor states that this device has a moderate level of concern.

Version:		
Level of Concern: Minor		
	Yes	No
Software description:	X	
Device Hazard Analysis:	X	
Software Requirements Specifications:	X	
Architecture Design Chart:		X
Software Design Specifications:		X
Traceability Analysis/Matrix:	X	
Software Development:		X
Verification & Validation Testing:	X	
Revision level history:	X	
Unresolved anomalies:		

All software sections contained within this submission are found to be acceptable documentation of the software and meet the software concerns as described in the FDA Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices, dated May 29, 1998.

XIV. Substantial Equivalence Discussion

	Yes	No	
1. Same Indication Statement?			If YES = Go To 3
2. Do Differences Alter The Effect Or Raise New Issues of Safety Or Effectiveness?			If YES = Stop NSE
3. Same Technological Characteristics?			If YES = Go To 5
4. Could The New Characteristics Affect Safety Or Effectiveness?			If YES = Go To 6
5. Descriptive Characteristics Precise Enough?			If NO = Go To 8 If YES = Stop SE
6. New Types Of Safety Or Effectiveness Questions?			If YES = Stop NSE
7. Accepted Scientific Methods Exist?			If NO = Stop NSE
8. Performance Data Available?			If NO = Request Data
9. Data Demonstrate Equivalence?			Final Decision: AI

XIV. Responses to Deficiencies

1. Substantial Equivalence – Revised Device Comparison Table

In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm²), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

Reviewer's Comments:

It appears the sponsor has misunderstood the question and did not satisfy the requirements of the previous AI Letter. Thus, the sponsor is being asked to provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. They are being asked to include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile) (See Deficiencies).

2. (b)(4)

Reviewer's Comments:

The sponsor responded with a letter which suggested that these comments were inappropriate, accusatory, and overall reflective of a non-objective evaluation of the submission. They further escalated the review to the CDRH Ombudsman, Les Weinstein. However, they have provided their Hair Count Methodology and Hair Count Data for individual patients.

The following Additional Questions involve the Statistical Concerns of the submission:

Please provide a revised clinical study which addresses the following concerns:

- There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.
- A large proportion of subjects screened were not accepted (82 accepted out of 157 screened.) It is unclear why the remaining 75 subjects (48% of

the total screened) were not enrolled. In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

- The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.
- The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.
- The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.
- The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

Reviewer's Comments:

Please refer to Statistician's Review Memo, Scott W. Miller (DBS, GSDB), for comments.

XV. Deficiencies (S1)

1. Substantial Equivalence – Revised Device Comparison Table

In our previous AI Letter Dated July 22, 2009 under Deficiency #1, there was a typo. Originally it stated:

"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your

device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."

It should have stated:

*"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have **not provided an adequate** comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."*

Regardless, in your answer to that deficiency, it appears that you have misunderstood the question. The Substantial Equivalence section must contain a stand-alone comparison of your device's technological characteristics along with other pertinent information compared to the predicates. That information is not referred to other sections, but provided in this section as a quick summary/comparison to the predicates. Thus, the deficiency above is asking to provide a Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

- A. Please provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Sterilization, and Materials. Also, please include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile).

Comments Regarding Your Response to Deficiency #1:

- In your response dated August 18, 2009 on page 6, your comments regarding the Indications for Use comparison, you refer to a bulleted list which points out similarities between the subject device and the predicates. This does not satisfy the requirements of what the original AI Letter asked, "compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement)." Thus, please revise your Device Comparison Table that includes a comparison of your device to the predicates in the area of: Indications of Use (which is reflective of the Indications for Use Statement).

- The Energy Range comparison you have provided is regarded as the power density. This comparison was found adequate. Please include them in your revised Device Comparison Table.

2. Biocompatibility

You have not addressed the biocompatibility issue for the patient contacting materials of your device. Since this is a bonnet type device, there is a strong possibility that the interior materials will come in contact with the individual's scalp.

- a. Please describe the patient contacting materials of your device.
- b. Please provide the biocompatibility test results of your patient contacting materials, or provide predicates.

The following Statistical Comments are in regards to your Response to our AI Letter Dated July 22, 2009:

Comment 1: There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.

You responded that a requirement to submit a double-blind, sham-control, randomized clinical trial is inappropriate and not reflective of the "least burdensome" requirements. You also state that this is a conclusion "not based on science, statistics, FDA regulations, or the contents of our 510(k) submission." You further state (without providing justification or elaboration) that the disease is such that a double-blind study "could lead to improper estimations."

This comment was not intended to suggest that an entirely new, randomized controlled trial would be necessary before it would be possible to evaluate this submission. It was a comment meant to convey that the fact that there was not a concurrent control arm in the trial data submitted suggests that there are potential difficulties in the evaluation of the clinical data presented. Randomized controlled trials are recognized as the gold standard of clinical research. However, as the sponsor states, FDA's least burdensome approach does recognize that there are situations where such a trial is impossible or unduly burdensome on the sponsor or patients, and states that alternative study designs are acceptable. Nevertheless, these alternative trial designs are more susceptible to certain types of bias than a randomized controlled trial. The data and description of the trial submitted for review were obtained from a single arm, un-blinded trial, wherein both the clinical staff administering the treatment as well as the patients receiving treatment were aware of the fact that there was an active treatment involved. It is possible that such knowledge affected other behaviors of the patients and/or clinical staff in a way which could affect hair growth or rate of hair loss. For example, patients may have combed, washed, styled, etc. their hair in a different way than normal as a

result of being in the trial. If there were a concurrent control arm, with subjects and possibly clinical staff blinded to the treatment assigned, then this potential could be evaluated and its possible effect separated from the effect of the investigational device. In the absence of such a control, it can not. This does not negate the value of the data obtained from this trial, it simply points out that the absence of a concurrent control arm makes it difficult to conclusively rule out such possibilities.

The preference for a double-blind, sham-control, randomized clinical trial is not due to simple personal preference of the reviewer. It is based on the well-established recognition of such trials as the gold standard for clinical research. As stated in the E9 guideline on statistical principles for clinical trials "the most important design techniques for avoiding bias in clinical trials are blinding and randomization" (Section II C (2.3))¹. The clinical trial submitted in support of this device did not utilize either of these methods. Further on (2.3.1) the document defines double-blind and single-blind trials and states "the double-blind trial is the optimal approach." While it goes on to recognize that there are situations in which a double-blind trial is not feasible, it then recommends "the single-blind option should be considered...clinical assessments should be made by medical staff who are not involved in treating subjects and who remain blind to treatment."

To quote from Piantadosi "investigators often underestimate the value of treatment and assessment masking. There is a tendency to believe that biases are small in relation to the magnitude of treatment effects (when, in fact, the converse is usually true) or that practitioners can compensate for their prejudice and subjectivity"².

Comment 2: (a) A large proportion of subjects screened were not accepted (82 accepted out of 157 screened). It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. **(b)** In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. **(c)** It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, **(d)** in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

(b)(4)

You appear to have misunderstood the point of this comment. It did not state that you had intentionally "deliberately" overestimated the effectiveness of the device. It did, however, raise some valid concerns regarding the recruitment and retention of subjects into the trial, as well as the handling of missing data.

¹ Guidance for Industry: E9 Statistical principles for clinical trials. FDA, 1998.

<http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm073137.pdf>

² S. Piantadosi. Clinical trials: a methodologic perspective. 1997. Wiley, New York.

(a) (b)(4)

(b)

(c)

(d)

that possibility in the absence of subject-level data. Thus, excluding subjects who failed to show up for all appointments (which itself may have been due to a perceived lack of effectiveness) could lead to a biased statistical estimate of the effectiveness of the device.

It should be pointed out that missing data is a significant issue in clinical research. The CDRH statistical guidance for non-diagnostic medical devices states "in many investigations, the Center may require an intention to treat analysis, which would record data of disqualified patients as a failure. Clearly, a relatively small number of patients that are disqualified in an intention to treat model could have a substantial impact upon the final analysis" (Section I).³ Further on, in Section K, it states "three of the more serious biases that may occur in a clinical trial are investigator bias, evaluator bias, and placebo or sham effect." It then describes these types of bias. Importantly, the lack of a concurrent control arm in this trial makes it much harder to rule out any of these potential biases.

Section V, part D (5.4) discusses follow-up. Specifically "completeness is defined as the proportion of patients entering the trial who come back for each and every follow-up appointment. It is extremely important that this proportion be as close to 100% as possible... follow-up percentages of less than 80% are generally considered poor and these trials are labeled incomplete." Further, "incomplete follow-up is a major concern in analysis. The trial must have procedures available to trace subjects who fail to appear for scheduled follow-up. Accounting for subjects lost to follow-up is a critical analytical issue because those patients may provide the most important information from the clinical trial, particularly if the outcome in such patients is poor."

Lastly, Section VI, part D (6.4): "the Agency will require an analysis of the data by 'intention-to-treat'. This is an analysis method in which 'the primary tabulations and summaries of outcome data are by assigned treatment'. In such analyses, patients lost to follow-up in the intervention and control groups must be counted as though they actually completed the study in their assigned group. Since there is no observation of outcome variable after the time the patient is lost to follow-up, the observation cannot be counted as a success (and is considered failure)"³.

The intent to treat concept is further discussed in Section V, part B (5.2.1) "the intention-to-treat principle implies that the primary analysis should include all randomized subjects." Further on "there are a limited number of circumstances that might lead to excluding randomized subjects from the full analysis set, including the failure to satisfy major entry criteria (eligibility requirements), the failure to take at least one dose of trial medication, and the lack of any data post-randomization." It goes on to specify the circumstances these exclusions should satisfy. It then states, "special problems arise in connection with subjects withdrawn from treatment after receiving one or more doses who provide no data after this point, and subjects otherwise lost to follow-up, because failure to include these subjects in the full analysis set may seriously undermine the

³ Statistical guidance for clinical trials of non-diagnostic medical devices. FDA, 1996.
<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm106757.htm>

approach.” In Section V, part C (5.3) it elaborates on missing data “missing values represent a potential source of bias in a clinical trial...an investigation should be made concerning the sensitivity of the results of analysis to the method of handling missing values, especially if the number of missing values is substantial.”

Comment 3: The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.

You responded that you felt that submitting a rigorous definition of how the primary endpoint of hair count was determined was not required for an initial 510(k) submission. Nevertheless, you went on to provide a detailed, several page description of this process.

The information provided adequately addresses the statistical reviewer's concerns on this point.

The reason this information was requested is that the primary endpoint of a clinical trial is an extremely important aspect of the trial; all aspects of the trial should revolve around it. As the submitted trial was an un-blinded, non-randomized, single-arm trial, it is extremely important that the primary endpoint be as objectively assessed as possible. To quote from the CDRH statistical guidance document, outcome variables “should be directly observable, objectively determined measures subject to minimal bias and error” (Section C)³. As discussed in Section K of the same document, “evaluator bias can be a type of investigator bias in which the person taking measurements of the outcome variable intentionally or unintentionally shades the measurements to favor one intervention over another.” The more rigorously defined the primary endpoint is, the less likely this type of bias may be involved. As the protocol submitted did not describe how these endpoints were obtained, there was insufficient information to make this determination.

Comment 4: The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

You responded that this is not technically a question, but rather a “biased and irrelevant determination.” You then clarified that the trial was conducted at one site (in High Point, North Carolina). You then claim that geographic issues are irrelevant, as the treatment is a laser at a wavelength subjects would not encounter in everyday life. You conclude with an exaggeration that the request was asking for studies to be conducted “in every corner of the world to be valid.”

This comment was, unfortunately, truncated from its original intent. It should have contained the question: “Please clarify which site(s) participated in the submitted trial”.

Regarding your claim that the implied determination was “biased and irrelevant”. The issue of study population is highly relevant to the trial. You are asking FDA to clear for

use a device intended for women with androgenic alopecia. You enrolled 82 subjects (only 60 of whom completed the trial). Subjects enrolled and treated at a single site may not be representative of the target population. For example, subjects treated at a single site are likely to be more homogeneous than the broader population in terms of variables such as: race, ethnicity, income, skin type, etc. To the extent that any of these variables is associated with responsiveness to the device or compliance with the treatment regimen, these issues are highly relevant.

Further, all subjects treated in this trial were done so under the aegis of a single clinical investigator. It is possible that this clinician is substantially more familiar with the device than other clinicians would be if the device were cleared for use. It is possible that the use of the device by such other clinicians may lead to variations in safety and / or effectiveness, perhaps only in a learning curve of the first few subjects, perhaps of longer duration. By conducting the trial at only one site, with one clinical investigator, these possibilities can not be adequately evaluated.

This issue is reflected in both the E9 guideline "the subjects in the trial should ... mirror the target population" (Section II B (2.2.1))¹ as well as the CDRH statistical guidance: "the study population should be a representative subset of the population targeted for the application of the medical device."³

Indeed, the E9 guideline states that one of the two main reasons for multicenter trials is to "provide a better basis for the subsequent generalization of its findings. This arises from the possibility of recruiting subjects from a wider population and of administering the medication in a broader range of clinical settings, thus presenting an experimental situation that is more typical of future use."

The following are deficiencies regarding the Clinical and Statistical Concerns of the submission:

3. Indications for Use—Need for Clinical Data

Your proposed indication for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," is not the same as predicate K060305's indications for use. Your claim for the treatment of females with androgenetic alopecia is not the same as predicate K060305's claim for treatment of males. In addition, your device has an indication for "reduce rate of hair loss in females," where as K060305 does not have a reduce hair loss claim in their indications for use.

Your device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, where as K060305 is a comb treating individual areas one at a time as the device is passed through the hair in a

combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

- Regarding your reduce rate of hair loss in females claim, this indication for use must be removed or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

4. Clinical Protocol Package

Please provide the entire clinical protocol package which includes the statistical success hypothesis used in this clinical study.

5. Indications for Use Clarification

The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

Your response points out that concurrent alternative therapy was an exclusion criterion of the trial.

This issue is highly relevant to the trial, particularly given that the clinical data submitted arise from an un-blinded, non-randomized, single-arm trial. As such, had any subjects been using a concurrent alternative therapy in addition to the investigational treatment, it would have confounded the results and made the evaluation of any improvement impossible to attribute to the investigational device, the concurrent treatment, or a possible interaction between the two. This question arose due to the apparent discrepancy between the proposed indications for use (allowing concurrent alternative therapies) and the clinical data submitted in support of this proposed indication (which excluded subjects with concurrent alternative therapies). Ideally, the trial should enroll and treat subjects as closely as possible to the intended indications for use.

In the absence of any clinical data on subjects treated with concurrent therapy, it is extremely difficult for FDA to evaluate the appropriateness of this proposed indication for use. The only clinically valid interpretation possible would be that the device is safe and effective when used as a monotherapy. There is no data to support its use in addition to other treatments, which may alter the safety and / or effectiveness of the investigational device.

- Please address this issue, given that the study population (women not using concurrent therapy) appears to be different from the intended target population (women who may or may not be using concurrent therapy).

6. Clarification on Data Sets

The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

You state that this information was available in the original submission, but failed to provide a page number reference. You then state that they feel this question "insinuates multiple criminal allegations of noncompliance."

This question regards the issue of analysis datasets. Virtually every clinical trial submitted for FDA review clearly delineates multiple analysis datasets. These typically consist of:

- A safety dataset, used for adverse event analysis and consisting of all subjects enrolled in the trial.
- A full analysis or intent to treat dataset, used for the primary effectiveness analysis and consisting of all subjects randomized to receive treatment.
- A per protocol dataset, used to replicate the primary effectiveness analysis and consisting of all subjects in the intent to treat dataset who meet pre-defined protocol adherence criteria.

The protocol submitted did not make any mention of which analysis dataset(s) were generated, nor how many subjects were in each. It is therefore not clear, for example, whether the 22 subjects who were initially enrolled but did not complete the trial were included in the safety analysis. The safety analysis essentially states that no adverse events were reported. Nevertheless, the denominator of how many subjects this statement covers is highly relevant. This question was not an "insinuation" that the sponsor had broken the law; it was a simple request for clarification on information that every other trial submitted to the Agency routinely provides in recognition of its importance in evaluating the data submitted. If this information was provided in the original submission, a page number reference to that effect would have sufficed. If not, a statement documenting which subjects the safety / adverse event data was based on would have been sufficient. The data provided states that 19 subjects were excluded from the trial after being enrolled, and another 3 removed between the first and final evaluations, but does not state whether these subjects were included in the safety analysis (a valid question, particularly as they were excluded from the effectiveness analysis.) It is unclear whether these subjects were ever treated or not.

As stated in the E9 guideline "the protocol should also specify procedures aimed at minimizing any anticipated irregularities in study conduct that might impair a satisfactory analysis, including various types of protocol violations, withdrawals, and missing values" (Section V, part B (5.2))

- Please clarify which subjects were assessed in the safety analysis; e.g., all screened subjects, all enrolled subjects, all subjects who were evaluated at the first assessment, all subjects who were evaluated at the second assessment, etc.

7. Clarification on Hair Count Method

From your explanation of your hair count method beginning on page 25 of your response to our AI Letter Dated July 22, 2009, it appears that the head was divided into quarters with multiple photographs being taken of each quarter. But on page 26, there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. It is unclear what is meant by the phrase "count photo," since it appears all photos were being counted. In addition, this method seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Thus, depending on how this process is interpreted it seems that for each individual, up to 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. If this assumption is correct, what method was used to insure that baseline and follow-up photographs were identical in terms of scalp area viewed within each photograph. Please provide clarification on your Hair Count Method.

XVI. Contact History

07/22/2009 – An email sent to the sponsor regarding the request for AI.

09/02/2009 – A meeting was set up with CDRH Ombudsman, Les Weinstein.

Meeting attendees included Atiq Chowdhury (DSORD/GSDB), Neil Ogden (DSORD/GSDB), and Scott Miller (DBS/GSDB). It was concluded that the review would continue and the sponsor would be notified by next AI Letter and a teleconference would be set up.

09/10/2009 - An email sent to the sponsor regarding the request for AI and to arrange teleconference.

XVII. Recommendation

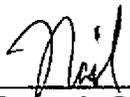
I recommend that this submission be placed on hold pending the receipt of the response to the above questions.



Reviewer
Atiq Chowdhury
Biomedical Engineer
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

9/10/09

Date

 I concur with A.C.

Branch Chief
Neil Ogden
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

9/11/09

Date

September 10, 2009

Helmut Keidl
President
Midwest RF, LLC, Hartland, WI 53029
Ph#: 262-367-8254
Fax#: 262-367-8544
e-mail: helmut@midwestcomposite.com

Re: 510(k) submission – MEP-90 Growth Stimulation System (K091496)

Dear Mr. Helmut Keidl,

In reviewing the subject submission, we have the following additional questions that need to be clarified to facilitate our review process:

1. Substantial Equivalence – Revised Device Comparison Table

In our previous AI Letter Dated July 22, 2009 under Deficiency #1, there was a typo. Originally it stated:

"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."

It should have stated:

*"In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have **not provided an adequate** comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials."*

Regardless, in your answer to that deficiency, it appears that you have misunderstood the question. The Substantial Equivalence section must contain a stand-alone comparison of your device's technological characteristics along with other pertinent information compared to the predicates. That information is not referred to other sections, but provided in this section as a quick summary/comparison to the predicates. Thus, the deficiency above is asking to provide a Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range

(J/cm²), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

- A. Please provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (μs), and Pulse Rate (Hz); Sterilization, and Materials. Also, please include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile).

Comments Regarding Your Response to Deficiency #1:

- In your response dated August 18, 2009 on page 6, your comments regarding the Indications for Use comparison, you refer to a bulleted list which points out similarities between the subject device and the predicates. This does not satisfy the requirements of what the original AI Letter asked, "compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement)." Thus, please revise your Device Comparison Table that includes a comparison of your device to the predicates in the area of: Indications of Use (which is reflective of the Indications for Use Statement).
- The Energy Range comparison you have provided is regarded as the power density. This comparison was found adequate. Please include them in your revised Device Comparison Table.

2. Biocompatibility

You have not addressed the biocompatibility issue for the patient contacting materials of your device. Since this is a bonnet type device, there is a strong possibility that the interior materials will come in contact with the individual's scalp.

- a. Please describe the patient contacting materials of your device.
- b. Please provide the biocompatibility test results of your patient contacting materials, or provide predicates.

The following Statistical Comments are in regards to your Response to our AI Letter Dated July 22, 2009:

Comment 1: There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed

improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.

You responded that a requirement to submit a double-blind, sham-control, randomized clinical trial is inappropriate and not reflective of the "least burdensome" requirements. You also state that this is a conclusion "not based on science, statistics, FDA regulations, or the contents of our 510(k) submission." You further state (without providing justification or elaboration) that the disease is such that a double-blind study "could lead to improper estimations."

This comment was not intended to suggest that an entirely new, randomized controlled trial would be necessary before it would be possible to evaluate this submission. It was a comment meant to convey that the fact that there was not a concurrent control arm in the trial data submitted suggests that there are potential difficulties in the evaluation of the clinical data presented. Randomized controlled trials are recognized as the gold standard of clinical research. However, as the sponsor states, FDA's least burdensome approach does recognize that there are situations where such a trial is impossible or unduly burdensome on the sponsor or patients, and states that alternative study designs are acceptable. Nevertheless, these alternative trial designs are more susceptible to certain types of bias than a randomized controlled trial. The data and description of the trial submitted for review were obtained from a single arm, un-blinded trial, wherein both the clinical staff administering the treatment as well as the patients receiving treatment were aware of the fact that there was an active treatment involved. It is possible that such knowledge affected other behaviors of the patients and/or clinical staff in a way which could affect hair growth or rate of hair loss. For example, patients may have combed, washed, styled, etc. their hair in a different way than normal as a result of being in the trial. If there were a concurrent control arm, with subjects and possibly clinical staff blinded to the treatment assigned, then this potential could be evaluated and its possible effect separated from the effect of the investigational device. In the absence of such a control, it can not. This does not negate the value of the data obtained from this trial, it simply points out that the absence of a concurrent control arm makes it difficult to conclusively rule out such possibilities.

The preference for a double-blind, sham-control, randomized clinical trial is not due to simple personal preference of the reviewer. It is based on the well-established recognition of such trials as the gold standard for clinical research. As stated in the E9 guideline on statistical principles for clinical trials "the most important design techniques for avoiding bias in clinical trials are blinding and randomization" (Section II C (2.3))¹. The clinical trial submitted in support of this device did not utilize either of these methods. Further on (2.3.1) the document defines double-blind and single-blind trials and states "the double-blind trial is the

¹ Guidance for Industry: E9 Statistical principles for clinical trials. FDA, 1998.
<http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm073137.pdf>

optimal approach." While it goes on to recognize that there are situations in which a double-blind trial is not feasible, it then recommends "the single-blind option should be considered...clinical assessments should be made by medical staff who are not involved in treating subjects and who remain blind to treatment."

To quote from Piantadosi "investigators often underestimate the value of treatment and assessment masking. There is a tendency to believe that biases are small in relation to the magnitude of treatment effects (when, in fact, the converse is usually true) or that practitioners can compensate for their prejudice and subjectivity"².

(b)(4)

You responded that you felt this comment to be a "veiled insinuation" that FDA felt that you had provided "false and/or misleading" information. Further, you felt that we stated that "it is possible" that the data was "deliberately overestimated."

You appear to have misunderstood the point of this comment. It did not state that you had intentionally "deliberately" overestimated the effectiveness of the device. It did, however, raise some valid concerns regarding the recruitment and retention of subjects into the trial, as well as the handling of missing data.

- (a) A large proportion of the subjects who were screened into the trial were not enrolled (75 of 182 subjects, corresponding to 47.8% of the screened subjects). The possibility of unconscious selection bias on the part of the clinical staff cannot be entirely ruled out in light of this observation. This is particularly relevant given that the clinical trial was open-label and single-arm. This does not in any way imply that you have conducted the trial in an unethical or illegal way; it merely suggests that unconscious selection bias is a commonly encountered problem in clinical trials, which is one reason double-blind, randomized controlled trials are preferred.
- (b) The next issue raised was the fact that, of the 82 subjects accepted into the trial, only 63 were assessed at the 10 week follow-up, and 60 at the 18 week. The remaining 19 subjects were excluded from the primary effectiveness analysis. Excluding 19 of 82 (23% of the enrolled study cohort) enrolled subjects is not a commonly accepted statistical analysis

² S. Piantadosi. Clinical trials: a methodologic perspective. 1997. Wiley, New York.

practice. This is referred to as a "complete case" analysis, and has consistently been shown to lead to biased estimates of effectiveness because subjects who complete clinical trials tend to be different from subjects who do not complete them. As a result, the predominant analysis method in clinical trials is based upon the intent-to-treat principle, which would have involved some method of accounting for the subjects who were enrolled into the trial but did not complete it. This issue is discussed further regarding point (d).

- (c) Some of the subjects were excluded for reasons such as "excessive number of missed appointments." While it is true that including such patients in the analysis would tend to attenuate the estimated treatment effect, this is what is likely to occur in everyday practice should the device be approved and marketed. It is possible that some of these women stopped attending appointments due to a perceived lack of effectiveness. Indeed, this is not merely speculation, as I would refer to the following quote on page 26 of your response: "Anecdotal statements such as 'I would never have continued this for six months if it wasn't working' became the slogan of the study". This implies that at least some subjects would have considered dropping out of the study for a perceived lack of effectiveness. The possibility that subjects with missing data are not a random sample of the study population, but that they may have dropped for a reason related to their (unobserved) missing outcome data is referred to as missing not at random (MNAR), and is a serious issue.

(d)

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model could have a substantial impact upon the final analysis" (Section I).³ Further on, in Section K, it states "three of the more serious biases that may occur in a clinical trial are investigator bias, evaluator bias, and placebo or sham effect." It then describes these types of bias. Importantly, the lack of a concurrent control arm in this trial makes it much harder to rule out any of these potential biases.

Section V, part D (5.4) discusses follow-up. Specifically "completeness is defined as the proportion of patients entering the trial who come back for each and every follow-up appointment. It is extremely important that this proportion be as close to 100% as possible... follow-up percentages of less than 80% are generally considered poor and these trials are labeled incomplete." Further, "incomplete follow-up is a major concern in analysis. The trial must have procedures available to trace subjects who fail to appear for scheduled follow-up. Accounting for subjects lost to follow-up is a critical analytical issue because those patients may provide the most important information from the clinical trial, particularly if the outcome in such patients is poor."

Lastly, Section VI, part D (6.4): "the Agency will require an analysis of the data by 'intention-to-treat'. This is an analysis method in which 'the primary tabulations and summaries of outcome data are by assigned treatment'. In such analyses, patients lost to follow-up in the intervention and control groups must be counted as though they actually completed the study in their assigned group. Since there is no observation of outcome variable after the time the patient is lost to follow-up, the observation cannot be counted as a success (and is considered failure)"³.

The intent to treat concept is further discussed in Section V, part B (5.2.1) "the intention-to-treat principle implies that the primary analysis should include all randomized subjects." Further on "there are a limited number of circumstances that might lead to excluding randomized subjects from the full analysis set, including the failure to satisfy major entry criteria (eligibility requirements), the failure to take at least one dose of trial medication, and the lack of any data post-randomization." It goes on to specify the circumstances these exclusions should satisfy. It then states, "special problems arise in connection with subjects withdrawn from treatment after receiving one or more doses who provide no data after this point, and subjects otherwise lost to follow-up, because failure to include these subjects in the full analysis set may seriously undermine the approach." In Section V, part C (5.3) it elaborates on missing data "missing values represent a potential source of bias in a clinical trial... an investigation should be made concerning the sensitivity of the results of analysis to the method of handling missing values, especially if the number of missing values is substantial."

³ Statistical guidance for clinical trials of non-diagnostic medical devices. FDA, 1996.
<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm106757.htm>

Comment 3: The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.

You responded that you felt that submitting a rigorous definition of how the primary endpoint of hair count was determined was not required for an initial 510(k) submission. Nevertheless, you went on to provide a detailed, several page description of this process.

The information provided adequately addresses the statistical reviewer's concerns on this point.

The reason this information was requested is that the primary endpoint of a clinical trial is an extremely important aspect of the trial; all aspects of the trial should revolve around it. As the submitted trial was an un-blinded, non-randomized, single-arm trial, it is extremely important that the primary endpoint be as objectively assessed as possible. To quote from the CDRH statistical guidance document, outcome variables "should be directly observable, objectively determined measures subject to minimal bias and error" (Section C)³. As discussed in Section K of the same document, "evaluator bias can be a type of investigator bias in which the person taking measurements of the outcome variable intentionally or unintentionally shades the measurements to favor one intervention over another." The more rigorously defined the primary endpoint is, the less likely this type of bias may be involved. As the protocol submitted did not describe how these endpoints were obtained, there was insufficient information to make this determination.

Comment 4: The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

(b)(4)

This comment was, unfortunately, truncated from its original intent. It should have contained the question: "Please clarify which site(s) participated in the submitted trial".

(b)(4)

and treated at a single site may not be representative of the target population. For example, subjects treated at a single site are likely to be more homogeneous than the broader population in terms of variables such as: race, ethnicity, income, skin type, etc. To the extent that any of these variables is associated with responsiveness to the device or compliance with the treatment regimen, these issues are highly relevant.

Further, all subjects treated in this trial were done so under the aegis of a single clinical investigator. It is possible that this clinician is substantially more familiar with the device than other clinicians would be if the device were cleared for use. It is possible that the use of the device by such other clinicians may lead to variations in safety and / or effectiveness, perhaps only in a learning curve of the first few subjects, perhaps of longer duration. By conducting the trial at only one site, with one clinical investigator, these possibilities can not be adequately evaluated.

This issue is reflected in both the E9 guideline "the subjects in the trial should ... mirror the target population" (Section II B (2.2.1))¹ as well as the CDRH statistical guidance: "the study population should be a representative subset of the population targeted for the application of the medical device."³

Indeed, the E9 guideline states that one of the two main reasons for multicenter trials is to "provide a better basis for the subsequent generalization of its findings. This arises from the possibility of recruiting subjects from a wider population and of administering the medication in a broader range of clinical settings, thus presenting an experimental situation that is more typical of future use."

The following are deficiencies regarding the Clinical and Statistical Concerns of the submission:

3. Indications for Use—Need for Clinical Data

Your proposed indication for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," is not the same as predicate K060305's indications for use. Your claim for the treatment of females with androgenetic alopecia is not the same as predicate K060305's claim for treatment of males. In addition, your device has an indication for "reduce rate of hair loss in females," where as K060305 does not have a reduce hair loss claim in their indications for use.

Your device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, where as K060305 is a

comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

- Regarding your reduce rate of hair loss in females claim, this indication for use must be removed or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

4. Clinical Protocol Package

Please provide the entire clinical protocol package which includes the statistical success hypothesis used in this clinical study.

5. Indications for Use Clarification

The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

Your response points out that concurrent alternative therapy was an exclusion criterion of the trial.

This issue is highly relevant to the trial, particularly given that the clinical data submitted arise from an un-blinded, non-randomized, single-arm trial. As such, had any subjects been using a concurrent alternative therapy in addition to the investigational treatment, it would have confounded the results and made the evaluation of any improvement impossible to attribute to the investigational device, the concurrent treatment, or a possible interaction between the two. This question arose due to the apparent discrepancy between the proposed indications for use (allowing concurrent alternative therapies) and the clinical data submitted in support of this proposed indication (which excluded subjects with concurrent alternative therapies). Ideally, the trial should enroll and treat subjects as closely as possible to the intended indications for use.

In the absence of any clinical data on subjects treated with concurrent therapy, it is extremely difficult for FDA to evaluate the appropriateness of this proposed indication for use. The only clinically valid interpretation possible would be that the device is safe and effective when used as a monotherapy. There is no data to support its use in addition to other

treatments, which may alter the safety and / or effectiveness of the investigational device.

- Please address this issue, given that the study population (women not using concurrent therapy) appears to be different from the intended target population (women who may or may not be using concurrent therapy).

6. Clarification on Data Sets

The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

You state that this information was available in the original submission, but failed to provide a page number reference. You then state that they feel this question "insinuates multiple criminal allegations of noncompliance."

This question regards the issue of analysis datasets. Virtually every clinical trial submitted for FDA review clearly delineates multiple analysis datasets. These typically consist of:

- A safety dataset, used for adverse event analysis and consisting of all subjects enrolled in the trial.
- A full analysis or intent to treat dataset, used for the primary effectiveness analysis and consisting of all subjects randomized to receive treatment.
- A per protocol dataset, used to replicate the primary effectiveness analysis and consisting of all subjects in the intent to treat dataset who meet pre-defined protocol adherence criteria.

The protocol submitted did not make any mention of which analysis dataset(s) were generated, nor how many subjects were in each. It is therefore not clear, for example, whether the 22 subjects who were initially enrolled but did not complete the trial were included in the safety analysis. The safety analysis essentially states that no adverse events were reported. Nevertheless, the denominator of how many subjects this statement covers is highly relevant. This question was not an "insinuation" that the sponsor had broken the law; it was a simple request for clarification on information that every other trial submitted to the Agency routinely provides in recognition of its importance in evaluating the data submitted. If this information was provided in the original submission, a page number reference to that effect would have sufficed. If not, a

statement documenting which subjects the safety / adverse event data was based on would have been sufficient. The data provided states that 19 subjects were excluded from the trial after being enrolled, and another 3 removed between the first and final evaluations, but does not state whether these subjects were included in the safety analysis (a valid question, particularly as they were excluded from the effectiveness analysis.) It is unclear whether these subjects were ever treated or not.

As stated in the E9 guideline "the protocol should also specify procedures aimed at minimizing any anticipated irregularities in study conduct that might impair a satisfactory analysis, including various types of protocol violations, withdrawals, and missing values" (Section V, part B (5.2))

- Please clarify which subjects were assessed in the safety analysis; e.g., all screened subjects, all enrolled subjects, all subjects who were evaluated at the first assessment, all subjects who were evaluated at the second assessment, etc.

7. Clarification on Hair Count Method

From your explanation of your hair count method beginning on page 25 of your response to our AI Letter Dated July 22, 2009, it appears that the head was divided into quarters with multiple photographs being taken of each quarter. But on page 26, there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. It is unclear what is meant by the phrase "count photo," since it appears all photos were being counted. In addition, this method seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Thus, depending on how this process is interpreted it seems that for each individual, up to 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. If this assumption is correct, what method was used to insure that baseline and follow-up photographs were identical in terms of scalp area viewed within each photograph. Please provide clarification on your Hair Count Method.

The subject submission will be placed on hold pending your response with the requested information. If you need more than 30 days to provide a full and complete response, you should submit a request for an extension of time to Document Mail Center (HFZ 401). For further information on how to apply for an extension and for general 510(k) information, please visit the FDA Website at: http://www.fda.gov/cdrh/devadvice/31435.html#link_6

Sincerely,

Atiq Chowdhury
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GSDB/DGRND/ODE/FDA
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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Food and Drug Administration

MEMORANDUM

Date: September 3, 2009

From: Scott W. Miller, Mathematical Statistician, WO66-2321
DBS, GSDB

Subject: Review of 510(k) submission K091496 / S001
MEP-90 hair growth stimulation system, Midwest RF

To: Atiq Chowdhury, WO66-1447
DSORD, GSDB

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¹ Guidance for Industry: E9 Statistical principles for clinical trials. FDA, 1998.
<http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm073137.pdf>

² S. Piantadosi. Clinical trials: a methodologic perspective. 1997. Wiley, New York.

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³ Statistical guidance for clinical trials of non-diagnostic medical devices. FDA, 1996.
<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm106757.htm>

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If you have any questions, please contact me at (301)-796-6019 or Scott.Miller@fda.hhs.gov.

Scott W Miller, PhD

CC:

Jianxiong (George) Chu, WO66-2104

Phyllis Silverman, WO66-2226

Richard Felten, WO66-1436

Neil Ogden, WO66-1438

DBS Reviews

Richard Felten

September 2, 2009

Comments regarding K091946

1. Regarding the response about indications for use, the proposed indication for use is not the same as HairMax. Midwest is requesting treatment of females and also an indication for "reduce rate of hair loss in females". HairMax is cleared for treating males only and does not have a reduce hair loss indication for use. Thus, requesting clinical data on female treatment is a correct decision. Also clinical data would be needed to demonstrate reduce hair loss.
2. Regarding the reduce hair loss, this indication for use needs to be deleted or the company should provide clinical data to support this indication for use. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.
3. The Midwest device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp where as HairMax is a comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Again difference in treatment regime supports the need for clinical data.
4. Given that clinical data is required the slight differences in device specifications is not critical since the clinical data provided should demonstrate safety and effectiveness.
5. The company does need to provide information on patient contact or potential contact materials. Since this is a bonnet type device there is a strong possibility that the interior materials will come in contact with the individual's scalp. The company needs to identify the materials and either provide information on similar use or provide biocompatibility data.
6. The process to enroll subjects does appear OK. What they appear to have done is advertise for interested individuals, then screen them to see if they meet the inclusion criteria. In this format it would be expected that not all applicants would meet the inclusion criteria therefore the screened number would be expected to be larger than the enrolled number.
7. Regarding lost to follow-up, those who missed the first treatment, the subject who decided to get pregnant, and the subject who was diagnosed with lichen planopilaris are legitimate drop-outs. The subjects who missed excessive

appointments should probably be considered failures. This should be discussed possibly with a statistician and within the branch.

8. The actual hair count data, if accepted, does appear to demonstrate and increase in number of hairs within the treated/counted area for a majority of subjects. Even if we required a success greater than a 20% increase there would be 50 such successes at 10 weeks and 58 at 18 weeks. HairMax success was a 10% increase with a statistical difference at this level between placebo and treated.

Issues that need to be discussed:

1. Is a placebo treated arm required for low level light therapy or can the individual's baseline act as control with change from baseline being the success criteria?
2. We still do not have a complete protocol package but do have the individual data for each subject. Is this OK or should we request the protocol and see if there was a statistical success hypothesis?
3. Is the method used to count hair acceptable? I have read this several times but still do not have a clear idea of exactly how the counts were performed. It appears that the head was divided into quarters with multiple photographs being taken of each quarter. But there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. The photograph I have on my copy on page 27 does not show this very well. What I am not sure of is what is meant by the count photo, I thought all photos were being counted. Also, this section seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Depending on how this process is interpreted it seems that for each individual, upto 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. We need to discuss this methodology.
4. The data for success is based on 10 and 18 week data which does appear OK. The company has, however, stated that treatment lasted for 26 weeks or 52 treatments. Should we ask if they also have hair count data at 26 weeks and/or should we at least ask for confirmation of no adverse effects out to 26 weeks?



COVER SHEET MEMORANDUM

From: Reviewer Name Atiq Chowdhury
Subject: 510(k) Number K091496
To: The Record

Please list CTS decision code AI

- Refused to accept (Note: this is considered the first review cycle, See Screening Checklist http://erom.fda.gov/eRoomReq/Files/CDRH3/CDRHPreMarketNotification510kProgram/0_5631/Screening%20Checklist%207%202007.doc)
- Hold (Additional Information or Telephone Hold).
- Final Decision (SE, SE with Limitations, NSE, Withdrawn, etc.).

Please complete the following for a final clearance decision (i.e., SE, SE with Limitations, etc.):		YES	NO
Indications for Use Page	Attach IFU	/	
510(k) Summary /510(k) Statement	Attach Summary	/	
Truthful and Accurate Statement.	Must be present for a Final Decision	/	
Is the device Class III? If yes, does firm include Class III Summary?	Must be present for a Final Decision		/
Does firm reference standards? (If yes, please attach form from http://www.fda.gov/opacom/morechoices/fdaforms/FDA-3654.pdf)			/
Is this a combination product? (Please specify category _____, see http://erom.fda.gov/eRoomReq/Files/CDRH3/CDRHPreMarketNotification510kProgram/0_413b/CO-MBINATION%20PRODUCT%20ALGORITHM%20(REVISED%203-12-03).DOC)			/
Is this a reprocessed single use device? (Guidance for Industry and FDA Staff – MDUFMA - Validation Data in 510(k)s for Reprocessed Single-Use Medical Devices, http://www.fda.gov/cdrh/ode/guidance/1216.html)			/
Is this device intended for pediatric use only?		/	
Is this a prescription device? (If both prescription & OTC, check both boxes.)		/	
Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank?			/
Is clinical data necessary to support the review of this 510(k)? Did the application include a completed FORM FDA 3674, Certification with Requirements of ClinicalTrials.gov Data Bank? (If not, then applicant must be contacted to obtain completed form.)		/	AAAA
Does this device include an Animal Tissue Source?			/
All Pediatric Patients age <=21			/
Neonate/Newborn (Birth to 28 days)			/
Infant (29 days -< 2 years old)			/
Child (2 years -< 12 years old)			/
Adolescent (12 years -< 18 years old)			/
Transitional Adolescent A (18 - <21 years old) Special considerations are being given to this group, different from adults age ≥ 21 (different device design or testing, different protocol procedures, etc.)			/

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Transitional Adolescent B (18 <= 21; No special considerations compared to adults => 21 years old)		
Nanotechnology		
Is this device subject to the Tracking Regulation? (Medical Device Tracking Guidance, http://www.fda.gov/cdrh/comp/guidance/169.html)	Contact OC.	

Regulation Number **Class*** **Product Code**
21 CFR 890.5500 II OAP
(*If unclassified, see 510(k) Staff)

Additional Product Codes: _____

Review:  6590 7/21/07
(Branch Chief) (Branch Code) (Date)

Final Review: _____
(Division Director) (Date)

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**Premarket Notification [510(k)] Review
Traditional**

K091496

DATE: July 22, 2009

TO: The Record

FROM: Atiq Chowdhury (Biomedical Engineer)

OFFICE: ODE

DIVISION: DSORD

510(K) HOLDER: Midwest RF, LLC

DEVICE NAME: MEP-90 Growth Stimulation System

CONTACT: Helmut Keidl, President
Midwest RF, LLC
1050 Walnut Ridge Drive
Hartland, Wisconsin 53029
Torrance, CA 90505

PHONE: 262-367-8254

FAX: 262-367-8544

EMAIL: helmut@midwestcomposite.com

I. Purpose and Submission Summary:

The 510(k) holder would like to introduce the MEP-90 Growth Stimulation System. Under this submission the sponsor is seeking clearance to market this new device for Prescription Use and as a Class II device. The sponsor is being requested additional information regarding following topics and this submission is being put ON HOLD until they provide the requested information.

- Substantial Equivalence – Device Comparison Table
- Substantial Equivalence – Clinical Data
- Statistical Concerns

II. Administrative Requirements

	Yes	No	N/A
Indications for Use page (Indicate if: Prescription or OTC)	X		
Truthful and Accuracy Statement	X		
510(k) Summary or 510(k) Statement	X		
Standards Form	X		

III. Device Description

	Yes	No	N/A
Is the device life-supporting or life sustaining?		X	
Is the device an implant (implanted longer than 30 days)?		X	
Does the device design use software?	X		
Is the device sterile?		X	
Is the device reusable (not reprocessed single use)?	X		
Are "cleaning" instructions included for the end user?			

The sponsor states the device, MEP-90 laser system, is to be used as an adjunctive for treatment of hair loss in women with androgenic alopecia, with Ludwig and Savin hair loss scale classification of I to II and Fitzpatrick skin types I-IV. The MEP-90 system consists of a computer that controls a dome that fits over a subject's head, providing stationary low-level laser equally spread over the entire scalp; this is intended to provide biostimulation, leading to hair growth. It uses a wavelength of 650 nm with a maximum power emission of 3 mW/cm². The sponsor believes that their device is preferable to the predicate for intended use due to the tighter control over the wavelength as well as the ability to expose a larger surface area.

IV. Indications for Use

The indication for use as given in the IFU statement (pg 10) is, "The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for: Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV."

Review of the sponsor's clinical data was found to be not adequate to support these indications for use. Thus, they are being asked to provide a revised clinical study (**See Performance Data—Clinical and Deficiencies**).

V. Predicate Device Comparison

The sponsor has listed two predicate devices and is claiming substantial equivalence to them, K060305– Hairmax Lasercomb and K032816 – Quantum Light Therapy System. The sponsor has provided a comparison table in their Substantial Equivalence Section (section pg 36) discussing the similarities of the device and its predicate in the areas of: output energy and wavelengths. However, the sponsor has not provided an adequate Substantial Equivalence Comparison and is being asked to provide a revised SE Comparison Table along with revised Clinical Data which was not found adequate (**See Performance Data—Clinical and Deficiencies**).

VI. Labeling

The sponsor has provided draft package inserts for device that include necessary safety instructions, warnings, and warranty statements. However, the sponsor's indications may need to be revised pending Substantial Equivalence decision, thus, may alter the Operator's Manual.

VII. Sterilization/Shelf Life/Reuse

The sponsor states that the device will be supplied non sterile and reusable. The sponsor has provided Maintenance instructions for the device (Operator's Manual pg 100). The sponsor states the device may be cleaned with a cloth and mild detergent on the surface. This is found adequate.

VIII. Biocompatibility

The sponsor states (section 15) that the biocompatibility tests were not found applicable since the same patient contacting materials were found in the predicate. This is found adequate.

IX. Electromagnetic Compatibility and Electrical, Mechanical and Thermal Safety

The sponsor states (pg 38) they complied with IEC 60601-1-2 and to 21 CFR 1040.10. This is found adequate.

X. Performance Testing – Bench

None Provided

XI. Performance Testing – Animal

None Provided

XII. Performance Testing – Clinical

A Clinical Consult was given to Richard Felten (DSORD/GSDB) and a Statistical Consult to Scott Miller (DBS/GSDB). Both concluded that the clinical study was not adequate (See Attached Memos).

The sponsor conducted (pg 15-42) a single-arm, non-randomized, un-blinded clinical trial to determine the safety and effectiveness of the MEP-90 laser for this indication. The protocol does not appear to have received prior FDA review, but was conducted under IRB approval and supervision (by Western IRB). The primary investigator's CV and website suggests that he has three clinical sites: one in Pennsylvania and two in North Carolina - it is unclear whether subjects were enrolled at only one of these sites or at all three.

Pivotal trial design:

The pivotal trial treated enrolled women with 36 20-minute treatment sessions over an 18 week period. Assessments were made at weeks 10 and 18. To be eligible for the trial, female subjects were screened for Ludwig and Savin hair loss scale classification of I to II, Fitzpatrick skin types I-IV, and a diagnosis of androgenic alopecia.

The primary endpoint was a responder analysis, with two co-primary hypotheses:

- After 20 treatments (week 10) $\geq 50\%$ of subjects demonstrated an increased hair count of $\geq 10\%$
- After 36 treatments (week 18) $\geq 50\%$ of subjects demonstrated an increased hair count of $\geq 20\%$ and/or a reduction in the rate of hair loss.

The trial had several secondary endpoints (impact on existing hair, stabilization of hair loss, impact on hair growth cycle) but as these were not clearly defined, and are not associated with any hypothesis tests, the results of the secondary endpoints will not be presented in this memo.

A total of 157 women were screened, with 82 being enrolled. The sponsor removed 19 subjects due to dropout (4), an excessive number of missed appointments (13), incorrect diagnoses (1) and a subject who decided to become pregnant before the end of the trial (1) for a final total of 63 subjects at the 10 week assessment and 60 at the 18 week assessment. The study population was primarily Caucasian (69%) and African American (27%); the remaining 4% were Hispanic (2%) and Other (2%).

The wide disparity between the number of subjects screened, enrolled, and analyzed raises concerns over the possibility of both investigator selection bias and patient self-selection, as patients who did not respond may have chosen to drop out of the study.

Thus, the final conclusion from both consultants was that at this time, an adequate review of this application from a clinical perspective is not possible. Without having a placebo control arm for comparison and not having evidence that there was randomization between treated and placebo control, the data provided in this application is inadequate.

XIII. Software

The sponsor states that this device has a moderate level of concern.

Version:		
Level of Concern: Minor		
	Yes	No
Software description:	X	
Device Hazard Analysis:	X	
Software Requirements Specifications:	X	
Architecture Design Chart:		X
Software Design Specifications:		X
Traceability Analysis/Matrix:	X	
Software Development:		X
Verification & Validation Testing:	X	

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Revision level history:	X	
Unresolved anomalies:		

All software sections contained within this submission are found to be acceptable documentation of the software and meet the software concerns as described in the FDA Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices, dated May 29, 1998.

XIV. Substantial Equivalence Discussion

	Yes	No	
1. Same Indication Statement?			If YES = Go To 3
2. Do Differences Alter The Effect Or Raise New Issues of Safety Or Effectiveness?			If YES = Stop NSE
3. Same Technological Characteristics?			If YES = Go To 5
4. Could The New Characteristics Affect Safety Or Effectiveness?			If YES = Go To 6
5. Descriptive Characteristics Precise Enough?			If NO = Go To 8 If YES = Stop SE
6. New Types Of Safety Or Effectiveness Questions?			If YES = Stop NSE
7. Accepted Scientific Methods Exist?			If NO = Stop NSE
8. Performance Data Available?			If NO = Request Data
9. Data Demonstrate Equivalence?			Final Decision: AI

XIV. Deficiencies

1. Substantial Equivalence – Revised Device Comparison Table

In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm²), Pulse Duration (µs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

2. Substantial Equivalence: Clinical Data

The information provided in this submittal is not adequate for a determination of improved hair growth. The deficiencies identified in this review are:

1. You did not use a placebo control group for comparison. Since this is a low level laser therapy system, a placebo control is required for such clinical studies and the predicate laser, the Lexington International HairMax, did have a randomized, blinded evaluation, placebo control study.
2. You have not provided individual data for the individual subjects enrolled in the study.
3. You have not provided the actual statistical analyses performed to determine success and have not provided a detailed protocol for the study.
4. Based on the summary information provided, there does not appear to be any actual data for the requested indication for use of preventing or reducing hair loss.

At this time an adequate review of this application from a clinical perspective is not possible. Without having a placebo control arm for comparison and not having evidence that there was randomization between treated and placebo control, the data provided in this application is inadequate.

Please provide data from a placebo control, randomized clinical study to support your requested indications for use.

The following Additional Questions involve the Statistical Concerns of the submission:

Please provide a revised clinical study which addresses the following concerns:

- There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.
- A large proportion of subjects screened were not accepted (82 accepted out of 157 screened.) It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

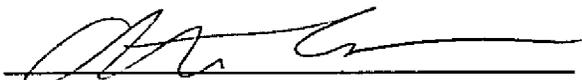
- The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.
- The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.
- The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.
- The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

XV. Contact History

07/22/2009 – An email sent to the sponsor regarding the request for AI.

XVI. Recommendation

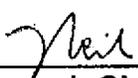
I recommend that this submission be placed on hold pending the receipt of the response to the above questions.



Reviewer
Atiq Chowdhury
Biomedical Engineer
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

7/22/09

Date

 I concur with AI.

Branch Chief
Neil Ogden
General and Surgical Devices Branch
Division of Surgical, Orthopedic, and Restorative Devices

7/22/09

Date

July 13, 2009

Consulting Review of K091496

Submitted by Midwest RF, LLC

Reviewed by Richard P. Felten, DSORD, GSDB

This review is limited to comments regarding the clinical data submitted by Midwest RF to support their request for marketing clearance of their MEP-90 Hair Growth Stimulation System. The MEP-90 is a helmet type laser system with an output of 650 nm ($\pm 0.76\%$) measured and a maximum emission power of $\leq 3 \text{ mW/cm}^2$ measured. The indication for use being requested is "Adjunctive use for the treatment of androgenic alopecia in females. The MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenic alopecia who have Ludwig and Savin Hair Loss Scale classification of I to II and who have been determined to have a Fitzpatrick Skin Type of I to IV".

The company has provided a summary of their clinical data. The study actually enrolled 82 subjects following screening of 157 subjects. Effectiveness was determined by hair counts at 10 weeks (20 treatments) and again at 18 weeks (36) treatments. Success was based on 50% or more of the subjects showing a $\geq 10\%$ increase in hair counts.

The information provided in this submittal is not adequate for a determination of improved hair growth. The deficiencies identified in this review are:

1. The company did not apparently use a placebo control group for comparison. Since this is a low level laser therapy system, a placebo control is required for such clinical studies and the predicate laser identified by the company, the Lexington International HairMax did have a randomized, blinded evaluation, placebo control study.
2. The company has not provided individual data for the individual subjects enrolled in the study.
3. The company has not provided the actual statistical analyses performed to determine success and have not provided a detailed protocol for the study.
4. Based on the summary information provided, there does not appear to be any actual data for the requested indication for use of preventing or reducing hair loss.

At this time an adequate review of this application from a clinical perspective is not possible. Without having a placebo control arm for comparison and not having evidence

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that there was randomization between treated and placebo control, the data provided in this application is inadequate.

The company should be requested to provide data from a placebo control, randomized clinical study as support for their requested indication for use.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Food and Drug Administration

MEMORANDUM

Date: July 20, 2009

From: Scott W. Miller, Mathematical Statistician, WO66-2321
DBS, GSDB

Subject: Review of 510(k) submission K091496
MEP-90 hair growth stimulation system, Midwest RF

To: Atiq Chowdhury, WO66-1447
DSORD, GSDB

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If you have any questions, please contact me at (301)-796-6019 or Scott.Miller@fda.hhs.gov.
Scott W Miller, PhD

CC:

Phyllis Silverman, WO66-2226

Richard Kotz, WO66-2228

Richard Felten, WO66-1436

Neil Ogden, WO66-1438

DBS Reviews

July 22, 2009

Helmut Keidl
President
Midwest RF, LLC, Hartland, WI 53029
Ph#: 262-367-8254
Fax#: 262-367-8544
e-mail: helmut@midwestcomposite.com

Re: 510(k) submission – MEP-90 Growth Stimulation System (K091496)

Dear Mr. Helmut Keidl,

In reviewing the subject submission, we have the following additional questions that need to be clarified to facilitate our review process:

1. Substantial Equivalence – Revised Device Comparison Table

In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

2. Substantial Equivalence: Clinical Data

The information provided in this submittal is not adequate for a determination of improved hair growth. The deficiencies identified in this review are:

1. You did not use a placebo control group for comparison. Since this is a low level laser therapy system, a placebo control is required for such clinical studies and the predicate laser, the Lexington International HairMax, did have a randomized, blinded evaluation, placebo control study.
2. You have not provided individual data for the individual subjects enrolled in the study.
3. You have not provided the actual statistical analyses performed to determine success and have not provided a detailed protocol for the study.
4. Based on the summary information provided, there does not appear to be any actual data for the requested indication for use of preventing or reducing hair loss.

At this time an adequate review of this application from a clinical perspective is not possible. Without having a placebo control arm for comparison and not having evidence that there was randomization between treated and placebo control, the data provided in this application is inadequate.

Please provide data from a placebo control, randomized clinical study to support your requested indications for use.

The following Additional Questions involve the Statistical Concerns of the submission:

Please provide a revised clinical study which addresses the following concerns:

- There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.
- A large proportion of subjects screened were not accepted (82 accepted out of 157 screened.) It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.
- The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.
- The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.
- The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if

any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

- The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

The subject submission will be placed on hold pending your response with the requested information. If you need more than 30 days to provide a full and complete response, you should submit a request for an extension of time to Document Mail Center (HFZ 401). For further information on how to apply for an extension and for general 510(k) information, please visit the FDA Website at: http://www.fda.gov/cdrh/devadvice/31435.html#link_6

Sincerely,

Atiq Chowdhury
Biomedical Engineer
(240)276-3805
GSDB/DGRND/ODE/FDA
atiq.chowdhury@fda.hhs.gov



U.S. Food and Drug Administration
Center for Devices and Radiological Health
Document Mail Center – WO66-G609
10903 New Hampshire Avenue
Silver Spring, MD 20993-0002

August 21, 2009

MIDWEST R.F. LLC.
1050 WALNUT RIDGE DRIVE
HARTLAND, WISCONSIN 53029
UNITED STATES
ATTN: HELMUT KEIDL

510k Number: K091496

Product: MEP-90 HAIR GROWTH

The additional information you have submitted has been received.

We will notify you when the processing of this submission has been completed or if any additional information is required. Please remember that all correspondence concerning your submission MUST be sent to the Document Mail Center (HFZ-401) at the above letterhead address. Correspondence sent to any address other than the one above will not be considered as part of your official premarket notification submission. Also, please note the new Blue Book Memorandum regarding Fax and E-mail Policy entitled, "Fax and E-Mail Communication with Industry about Premarket Files Under Review. Please refer to this guidance for information on current fax and e-mail practices at

<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm089402.htm>. On August 12, 2005 CDRH issued the Guidance for Industry and FDA Staff: Format for Traditional and Abbreviated 510(k)s. This guidance can be found at <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm084365.htm>. Please refer to this guidance for assistance on how to format an original submission for a Traditional or Abbreviated 510(k).

The Safe Medical Devices Act of 1990, signed on November 28, states that you may not place this device into commercial distribution until you receive a letter from FDA allowing you to do so. As in the past, we intend to complete our review as quickly as possible. Generally we do so in 90 days. However, the complexity of a submission or a requirement for additional information may occasionally cause the review to extend beyond 90 days. Thus, if you have not received a written decision or been contacted within 90 days of our receipt date you may want to check with FDA to determine the status of your submission.

If you have procedural questions, please contact the Division of Small Manufacturers International and Consumer Assistance (DSMICA) at (301)796-7100 or at their toll-free number (800)638-2041, or contact the 510k staff at (301)796-5640.

Sincerely,

510(k) Staff

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K0916/96/5'

August 19, 2009

Food and Drug Administration
Center For Devices and Radiological Health
Document Mail Center (HFZ-401)
9200 Corporate Boulevard
Rockville, MD 20850

Received
AUG 20 2009
FDA CDRH DMC

ATTN: LTJG Atiq Chowdhury

Subject: Response to Your 7/22/09 Letter Referencing 510(k) Submission K091946

Dear LTJG Chowdhury:

This is in response to your letter of July 22, 2009 regarding the above referenced 510(k) application.

We interpreted your letter of July 22nd to consist of two main areas:

- 1) **Questions and/or deficiencies you determined were in our 510(k) application concerning substantial equivalence (SE).**
- 2) **Your determination that our clinical efficacy study had no merit and/or value.**

My staff has over 40 years of regulatory affairs experience involving the Food and Drug Administration. Based on that, both they and I have very serious concerns about the content, context, and even the accusatory aspects of your letter. For those reasons, we felt it mandatory to initiate the "least burdensome complaint process" through the FDA's Ombudsman program starting with CDRH's Ombudsman, Mr. Les Weinstein. Regardless of where that process ultimately leads, my staff and I still wanted to respond to your letter in the allotted 30-day time period given.

For your reference and review, I am providing a scanned and labeled copy for each part of your correspondence with each of our responses.

To assist your understanding of our interpretations of your letter, I cite the following FDA position:

...Thus, as a matter of practice, CDRH generally considers a device to be SE to a predicate device if, in comparison to the predicate device:

- the new device has the same intended use; and,
- the new device has the same technological characteristics, (i.e., same materials, design, energy source, etc.); or, it has new technological characteristics that could not affect safety or effectiveness; or
- it has new technological characteristics that could affect safety or effectiveness, and

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- there are accepted scientific methods for evaluating whether safety or effectiveness has been adversely affected as a result of the use of new technological characteristics; and
- there are data to demonstrate that the new technological features have not diminished safety or effectiveness.

I. Questions and/or deficiencies you determined were in our 510(k) application concerning substantial equivalence (SE).

Although we did find several previously overlooked typographical errors in our 510(k) submission, we believe we followed the proper formatting as called for by the FDA and provided the specific data in our submission you are requesting in accordance with "CDRH's Substantial Equivalence Guidelines."¹

We believe our MEP-90 510(k) application meets and/or exceeds these "substantially equivalent" requirements to other devices already approved by the FDA for commercial distribution in the United States.

On pages 50 and 51, we submitted the FDA's published Screening Checklist For Premarket Notification 510(k) Submissions. Without any published changes on the part of the FDA regarding a 510(k) application for this type of device, the FDA has continually approved the format as we submitted it.

It should be noted that some of the items you asked for us to compare to the predicate devices are proprietary to those manufacturers and any attempt on our part to acquire said data constitutes "Theft of Trade Secrets" which is a violation of 18U.S.C., §1832.

In ¶1 of your letter you stated:

A1. Substantial Equivalence – Revised Device Comparison Table
In your Substantial Equivalence Section, you have provided a Device Comparison Table comparing your device to the predicates. However, you have not provided a comparison of your device to the predicates. Please provide a revised Device Comparison Table that compares your device to the predicates in the areas of: Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range (J/cm^2), Pulse Duration (μs), and Pulse Rate (Hz), Power (W), Aiming Beam, Output Mode, Sterilization, Accessories, and Materials.

¹ The Least Burdensome Provisions of the FDA Modernization Act of 1997: Concept and Principles, Final Guidance for FDA and Industry; October 2002, U.S. Department of Health and Human Services; Food and Drug Administration; Center for Devices and Radiological Health-Office of Device Evaluation and Center for Biologics

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General - On pages 36 and 37 of our application we provided the section titled MEP-90 Comparison of Equivalency To Predicate Devices. Your letter (A) stated, "You have provided a Device Comparison Table..." then you stated, "However, you have not provided a comparison of your device to the predicates."

You then proceeded to provide a listing of those specific items that we failed to address, yet they were clearly specified. I will address each one from your list individually:

Indications of Use - On page 10 of our application, we clearly provided our "Indications of Use" form for the MEP-90 as "Prescription Use Only" and the following:

The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

Adjunctive use for the treatment of androgenic (androgenetic) alopecia in females and is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic (androgenetic) alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

On page 12, which is part of our 510(k) Summary, we clearly provided our Indications For Use as prescribed by the FDA:

VI. Indications For Use

The MEP-90 is a non-heating lamp as described under the provisions of 21 CFR §890.5500 and is indicated for:

Medically prescribed adjunctive use for the treatment of androgenic alopecia in females;

the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenic (androgenetic) alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.

I cite the FDA's published position:

THE MEANING OF INTENDED USE

While a new device must have the same intended use as a predicate device in order to be SE, the Center does not require that a new device be labeled with precise therapeutic or diagnostic statements identical to those that appear on predicate device labeling in order for the new device to have the same intended use. Label statements may vary. Certain elements of a predicate device's labeled indication may not be critical to its intended therapeutic, diagnostic, prosthetic, surgical, etc., use. The Center's scientific expertise enables it to exercise considerable discretion in construing intended uses in the labeling and promotional materials for predicate and new devices. 3/ Thus, a new device with the same intended use as a predicate device may have different specific indication statements, and, as long as these label indications do not introduce questions about safety or effectiveness different from those that were posed by the predicate device's intended use, the new device may be found SE.

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For the purposes of determining whether or not the new device has the same intended use as a predicate device, the Center assesses any difference in label indications in terms of the safety and effectiveness questions they may raise. The Center considers such points as physiological purpose (e.g. removes water from blood, transports blood, cuts tissue), condition or disease to be treated or diagnosed, professional or lay use, parts of the body or types of tissue involved, frequency of use, etc. If a new device is determined to have the same intended use, the Center may then proceed to determine whether or not it is substantially equivalent.

There are no new "safety and/or effectiveness" issues with the MEP-90, which is classified by CDRH as a "non-significant risk" (NSR) device. Our submission provided all the necessary data in the prescribed and accepted format addressing safety and effectiveness.²

Regardless, on pages 36 of our 510(k) submission, specifically titled MEP-90 System Comparisons To Predicate Devices we clearly provided the "Indications of Use" comparisons to the Lexington predicate device, as verified by the following excerpt from our application:

The MEP-90 Hair Growth Stimulation System has the same intended use and/or technological characteristics as the predicate devices.

- 1- The MEP-90 System is substantially equivalent to predicate device K060305 for adjunctive use in providing treatment of androgenic (androgenetic) alopecia.
- 2- The MEP-90 System is substantially equivalent to predicate device K060305 for stimulating hair growth in patients diagnosed with androgenic (androgenetic) alopecia.
- 3- The MEP-90 System meets the clinical application criterion of predicate device K060305 in that it provides identical treatment coverage of the anatomical area called for by a current medically accepted protocol.

Since it was clearly provided, could you please clarify what you meant?

Wavelength Range – On pages 36 and 37 of our 510(k) submission, specifically MEP-90 System Comparisons To Predicate Devices we clearly provided the wavelength comparison to the predicate devices, as verified by the following excerpt from our 510(k) application:

² Excluding our anticipated need for extensive clinical efficacy data



MEP-90 System Comparisons To Predicate Devices						
Device	Manufacturer	Output		Regulation Number	Product	
		Power	Wavelength		Code	Nomenclature
MEP-90	Mitsumi RF LLC	44.5mw/cm ²	890nm (+/-1%)	21CFR 890.5500	OAP	Lamp, Infrared NPN
Identification/Classification: - 21CFR: 890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers) to provide topical heating. - is Predicate						
MEP-90	Levington Inf.	45mw/cm ²	890nm (+/-5%)	21CFR 890.5500	OAP	Lamp, Infrared
Identification/Classification: - 21CFR: 890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers) to provide topical heating.						
MEP-90	Stargate Inf.	45mw/cm ²	890nm (+/-5%)	21CFR 890.5500	NPN	Lamp, Infrared
Identification/Classification: - 21CFR: 890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers) to provide topical heating.						

Since it was clearly provided, could you please clarify what you meant?

Energy Range – On pages 36 and 37 of our 510(k) submission, specifically MEP-90 System Comparisons To Predicate Devices we clearly provided the energy range comparison to the predicate devices, as indicated by the excerpt from our 510(k) application:

MEP-90 System Comparisons To Predicate Devices						
Device	Manufacturer	Output		Regulation Number	Product	
		Power	Wavelength		Code	Nomenclature
MEP-90	Mitsumi RF LLC	44.5mw/cm ²	890nm (+/-1%)	21CFR 890.5500	OAP	Lamp, Infrared NPN
Identification/Classification: - 21CFR: 890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers) to provide topical heating. - is Predicate						
MEP-90	Levington Inf.	45mw/cm ²	890nm (+/-5%)	21CFR 890.5500	OAP	Lamp, Infrared
Identification/Classification: - 21CFR: 890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers) to provide topical heating.						
MEP-90	Stargate Inf.	45mw/cm ²	890nm (+/-5%)	21CFR 890.5500	NPN	Lamp, Infrared
Identification/Classification: - 21CFR: 890.5500 - A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers) to provide topical heating.						

Since it was clearly provided, could you please clarify what you meant?

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Pulse Duration – The MEP-90 lasers are continuously on, but do not raise any safety and/or effectiveness issues because the beams are not focused (diffused) and move throughout the treatment area during the procedure.

Pulse Rate – We made it clear that the MEP-90 lasers are continuously on so there is no specific "pulse rate."

Since it was clearly provided, could you please clarify what you meant?

Power – We did not understand what you meant by "Power W." Since all specifications of the MEP-90 were provided, we are in full compliance with CDRH laser registration requirements, and 21CFR §1010, again we are not sure of what you meant. On page 26 of our 510(k) submission, we listed our **Operational Specifications**, and I call your attention to items **1.1 through 1.4**:

Operational Specifications

The MEP-90 System has the following validated operational specifications:

1.1 Laser Emission Coverage

Emissions from the lasers diodes cover 95% of the patient therapy area at the working distance. Laser emissions are diffuse, not focused.

1.2 Laser Emission Wavelength

Laser emissions shall be at 650nm ($\pm 0.76\%$) measured

1.3 Laser Emission Power Output

Maximum emission power shall be $\leq 3\text{mw/cm}^2$ measured.

1.4 Laser Operating Voltage

3.2 VDC @ 50mA

On page 30 of our 510(k) application, which is part of the section titled, **MEP-90 Hair Growth Stimulation System SPECIFICATIONS**, we stated:

7. Power Requirements

7.1 Input Power

Device shall operate normally with:
85VAC - 265VAC at 50/60Hz

7.2 Computer and Periphery Power

Two switched and fused outlets are provided on the device itself for powering the operational computer and another periphery device.

7.3 Hardware Power Requirements

24VDC @ 10 amps
12VDC @ 10 amps
5VDC @ 10 amps

Since it was clearly provided, could you please clarify what you meant?

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Aiming Beam – Throughout the application we made it clear that our laser beams were not focused beams, but diffused. Let me provide you some of the specific examples:

First, I call your attention to **MEP-90 Hair Growth Stimulation System SPECIFICATIONS** (Page 26 – Line 1 to 3):

The MEP-90 Control Unit's powers 82 each 650nm visible, diffuse beam treatment lasers and one each 875nm infrared safety LED. The 82 treatment lasers are controlled by a fixed DC signal generator.

Second, I call your attention to **MEP-90 Hair Growth Stimulation System SPECIFICATIONS** (Page 26 – **§1.1 Laser Emission Coverage**):

1.1 Laser Emission Coverage

Emissions from the lasers diodes cover 95% of the patient therapy area at the working distance. Laser emissions are diffuse, not focused.

Third, I call your attention to the **MEP-90 Hair Growth Stimulation System Software Verification and Validation Guidelines, Protocol, And Report; §2.4.4 Mitigation** establishing increased patient safety over the predicate devices. Page 62 of our application:

2.4.4 Mitigation

Lasers have a non-focusing diffusion lens located in the radiation path. Lasers are not focused into a tight beam but have a large, diffuse pattern that causes the laser power to fall off exponentially as it moves farther from the laser. This type of laser radiation is too low to cause any damage to the patient's eyes.

Fourth, on page 84 in our submission we explain why we used diffuse beams which exceeds all CDRH standards for SE determination based on "new" safety issues:

The MEP-90 uses 82 lasers with diffused beams and a wavelength of 650nm each. The vast majority of manufacturers set their wavelength tolerances at $\pm 5\%$ or ± 5 nanometers. This translates to their actual wavelengths varying as much as 617nm to 683nm. However the MEP-90 utilizes measured wavelengths of 650nm to 650.8nm.

Fifth, our Operation Manual on page 6³ and page 9⁴ clearly states we use diffused beams. **Since it was clearly provided, could you please clarify what you meant?**

³ Page 84 of our 510(k) submission

⁴ Page 87 of our 510(k) submission

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Sterilization – The MEP-90 is not labeled and/or claimed to be a "sterile" device, therefore there can be no test results of non-existent sterilization procedure(s) comparison to the predicate devices. In addition, neither of the predicate devices claims sterilization requirements.

Since there is no direct patient contact and no relevance to human blood serum exposure, the sterilization procedures only were limited to the instructions within the Operation Manual on page 22 (MEP-90 System Maintenance), which was located on page 100 of our 510(k) application. I have provided a copy of an insert from the manual for your review:

IMPORTANT: The MEP-90 System can not be sterilized by any liquid or steam method

Since it was clearly provided, could you please clarify what you meant?

Accessories – Our 510(k) made no claim of accessories being required to operate the product that Midwest RF intends to supply at this time. Whereas, we are working on "supporting" items that we may offer for sale in the future, we did not claim any accessories within the 510(k) other than those listed on page 86 of our submission, which we clearly state are basic system components:

MEP-90 System Components And Nomenclature

Your MEP-90 Hair Growth Stimulation System has undergone extensive quality control and safety checks prior to shipping. In addition, our technicians have verified that it is in working order and ready to provide you reliable and accurate clinical performance for the foreseeable future.

The complete MEP-90 Hair Growth Stimulation System consists of ten items, consisting of eight (8) different components. We ask that you verify your receipt of all items at installation. In the unlikely event that any service or replacement issues arise, we ask that you refer to the specific component and its corresponding Part Number.

QID	Description	Part#
12a	MEP-90 Hair Growth Stimulation System Console	MEP0000
12b	Computer Keyboard	MEP0001
12c	Computer Mouse	MEP0002
12d	IE Medical Grade Power Cord	MEP0003
12e	MEP-90 Safety Lock Keys	MEP0004
12f	MEP-90 Operation Manual	MEP0005
12g	Operator and Patient Laser Safety Goggles	MEP0006
12h	MEP-90 Warranty Registration Card	MEP0007

Since it was clearly provided, could you please clarify what you meant?

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Materials – You indicated that we failed to provide a "materials" discussion in the Comparison Table regarding Predicate Devices. I call your attention to page 37, ¶10 of our MEP-90 System Comparison To Predicate Devices:

10- The comparison of patient contact materials of construction for the MEP-90 System do not raise any biocompatibility issues when compared to K060305 and K032816 as no patient contact is required and the materials have been verified to be biocompatible.

Since it was clearly provided, could you please clarify what you meant?

II. Your determination that our clinical efficacy study had no merit and/or value.

B2. Substantial Equivalence: Clinical Data

The information provided in this submittal is not adequate for a determination of improved hair growth. The deficiencies identified in this review are:

Clinical data is not required in a 510(k) application by the FDA, for this non-significant risk (NSR) device.⁵ Current FDA regulations clearly mandate what should or should not be submitted for consideration regarding substantial equivalence in a 510(k). However, due to the controversies and unregulated nature of this market, we anticipated the probable need for a determination of clinical effectiveness. In addition, since we provided the mandatory FDA Form 3455 information located on pages 16-17, we provided a certification that we had properly executed a full clinical study. As I indicated to the CDRH Ombudsman:

...we expected that the 510(k) review process would probably require some additional explanations and responses to questions.

Had we added all the documentation⁶ to support the above listing, it would have required approximately 5,000 additional pages be added to our 510(k) application, and that does not include the 87+ page formal report on the Study I had prepared to validate Midwest RF's decision as to whether or not to pursue of this technology.

⁵ The Least Burdensome Provisions of the FDA Modernization Act of 1997: Concept and Principles: Final Guidance for FDA and Industry; October 2002, U.S. Department of Health and Human Services; Food and Drug Administration; Center for Devices and Radiological Health-Office of Device Evaluation and Center for Biologics Evaluation and Research

⁶ Data generated from the IRB approved Study



We are also very concerned that you appear to have made SE and clinical efficacy determinations based on information that appears to have been acquired outside the realm and contents of our 510(k) submission. That is you determined the existence of clinical study deficiencies, but none were based on data provided in our 510(k) submission. *Could you please provide your source for your conclusions?*

As I also indicated to the CDRH Ombudsman, "We concur that the FDA has the right to review any and all parts of the Study and openly agree to support whatever it is you want to review." We do believe, as 21CFR attests to, that we have the reasonable expectation of objectivity for the review of what we submitted in our 510(k) application.

In your items labeled **C** through **G**, you made conclusions that were not based on science, statistics, FDA regulations, or the contents of our 510(k) submission. Whereas, most of the following could be reasonable follow-up requests to any study submitted, you presented them as determinations and not questions:

C1. You did not use a placebo control group for comparison. Since this is a low level laser therapy system, a placebo control is required for such clinical studies and the predicate laser, the Lexington International HairMax, did have a randomized, blinded evaluation, placebo control study.

D2. You have not provided individual data for the individual subjects enrolled in the study.

E3. You have not provided the actual statistical analyses performed to determine success and have not provided a detailed protocol for the study.

F4. Based on the summary information provided, there does not appear to be any actual data for the requested indication for use of preventing or reducing hair loss.

G At this time an adequate review of this application from a clinical perspective is not possible. Without having a placebo control arm for comparison and not having evidence that there was randomization between treated and placebo control, the data provided in this application is inadequate.



Then, without allowing us any response time, as indicated by **H** below, you made the determination that we must redo our entire Study in a format you personally find to be acceptable, although your demand has no basis in law, science, nor the contents of our 510(k):

H Please provide data from a placebo control, randomized clinical study to support your requested indications for use.

Our research of the publicly available data on the Lexington Study failed to find the slightest validation of the required "randomization"⁷ and "replication"⁸ procedures, which would prevent major errors in their findings.

The very nature of the disease and the technology employed, indicated that a double-blind study using Fisher's Exact Test calculations could lead to improper estimations, with minimal if any statistical significance.

Unlike pain studies with pharmaceuticals, there can be no "placebo effect" with regards to hair growth in women with androgenic alopecia. In addition, the issue of defining our control group was raised by the IRB, prior to their approval of the Study. Current FDA guidelines allow an alternative approach.⁹

As required with all clinical studies involving human subjects, we adhered to all provisions of:

- 21 CFR §812, Investigational Device Exemptions
- 21 CFR §50, Protection of Human Subjects
- 21 CFR §56, Institutional Review Boards
- 21 CFR §54, Financial Disclosure by Clinical Investigators
- 21 CFR §820 Subpart C, Design Controls of the Quality System Regulation
- 21CFR Subchapter J §1010
- 45CFR §46

On May 25, 2008 a 12-page response was made to Dr. Constance D. Vasek, Staff Physician

⁷ Diagnostic process not made available

⁸ No explanation of how they verified the treatments were performed

⁹ The Least Burdensome Provisions of the FDA Modernization Act of 1997: Concept and Principles; Final Guidance for FDA and Industry; October 2002, U.S. Department of Health and Human Services; Food and Drug Administration; Center for Devices and Radiological Health-Office of Device Evaluation and Center for Biologics Evaluation and Research

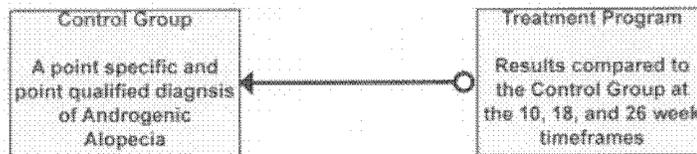


for the Western Institutional Review Board (WIRB®); regarding specific items pending with our submission to the IRB for approval of the Study. With regards to the "placebo control" group issue, we submitted the following:

Your Question #1:

1. Section C-page 3: It says the "control group" will consist of 80 subjects.... Generally in scientific research the control group is the group that is not treated or gets a placebo-type treatment. But it is clear in this research that you plan to treat this group. Could you just clarify that the control group you mention is the treatment group?

I used the term "**control group (block)**"¹ in the submission, but only "**control group**" in the booklet/handout. Regardless, the control group are those female subjects that meet the item specific criterion determined during the screening process. In essence, the treatment results will be compared to the control group's point specific defined diagnosis of androgenic alopecia:



This is an acceptable² method when there is considerable variation from observation to observation on the same experimental material and it is not feasible to run a large number of experiments. However, the experimenter must refine the experimental design in order to obtain a specified degree of precision (**blocking**).³ In addition, to be able to attach a probability statement to the observed treatment mean differences (a measure of the degree of confidence in the observed results), it is necessary that proper "**randomization**"⁴ and "**replication**"⁵ are built into the experimental design.

¹ Page 44, 2. Method of Investigation, ¶2

² W. T. Federer, Experimental Design, Theory and Application, New York, Macmillan Press

³ Page 47, Statistical and Integrity Considerations, "block"

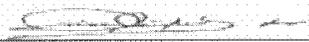
⁴ Page 48, Statistical and Integrity Considerations, "random sampling"

⁵ 52 treatments over a 26 week period.

An alternative method was approved and was so indicated on the IRB's Certificate of Approval. I enclose said approval, on the following page, for your review:

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WIRB <small>1-800-252-2800 1-800-562-4789 FAX: 1-800-252-2498</small>	Western Institutional Review Board® Western International Review Board® <small>3535 SEVENTH AVENUE, SW, OLYMPIA, WA 98507-3000 P.O. BOX 12029, OLYMPIA, WA 98508-2029</small>	Certificate of Approval
THE FOLLOWING WERE APPROVED:		
INVESTIGATOR: Grant F. Kohler D.O. 3520-203 McNeely Drive Raleigh, North Carolina 27612	BOARD ACTION DATE: 5/27/2008 PANEL: 3 STUDY APPROVAL EXPIRES: 5/27/2009 STUDY NUM: 1098575 WIRB PRO NUM: 20080612 INVEST NUM: 140351 WO NUM: 1-485401-1 CONTINUING REVIEW: Annually SITE STATUS REPORTING: Annually	
SPONSOR: Midwest RF, LLC PROTOCOL NUM: MEP-90A-CDA AMD, PRO. NUM: TITLE: MEP-90 Hair Growth Stimulation System Data Acquisition Study & Clinical Protocol MEP-90A-CDA		
APPROVAL INCLUDES:	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Alternative Study Methodology Approval </div>	
Investigator Administrative Letter (05-01-2008) Administrative Letter (05-25-2008) Protocol Consent Form (50) Advertisement #5561151.0 Brochure Clinical Data Acquisition & Research Study - As Modified		
WIRB APPROVAL IS GRANTED SUBJECT TO: The Board determined that the device as used in this research study is a non-significant risk device. The Board requires that all subjects must be able to consent for themselves to be enrolled in this study.		
<p style="text-align: center;">IF YOU HAVE ANY QUESTIONS, CONTACT WIRB AT 1-800-562-4789</p> <p style="text-align: center;">This is to certify that the information contained herein is true and correct as reflected in the records of the Western Institutional Review Board (WIRB). WE CERTIFY THAT WIRB IS IN FULL COMPLIANCE WITH GOOD CLINICAL PRACTICES AS DEFINED UNDER THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) REGULATIONS AND THE INTERNATIONAL CONFERENCE ON HARMONISATION (ICH) GUIDELINES.</p>		
 Theodore D. Schultz, J.D., Chairman	6/2/2008 (Date)	
<small>This document electronically reviewed and approved by Orive, Otsu on: 6/2/2008 1:31:53 PM PST. For more information call Client Services at 1-800-252-2500</small>		
<small>Board Action: 5/27/2008; Study: 1098575</small>	<small>Copyright © 2008 Western Institutional Review Board, Inc. All rights reserved.</small>	

I also call your attention to the other items specified under the heading, "Approval Includes."

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In ¶ below, you make a veiled insinuation that we may have provided "false and/or misleading" information. Again, instead of asking for an explanation, you made several erroneous determinations and then insinuated, "it is possible" our data was deliberately overestimated, which would be a Federal crime! You are insinuating we have committed criminal acts!

¶ • A large proportion of subjects screened were not accepted (82 accepted out of 157 screened.) It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

To facilitate your understanding, I am enclosing several excerpts from the Study that would be applicable to your determination ¶ above:

D. Principals, Research Site And Equipment Used

The IRB approved Principal Investigator for the Study was Grant F. Koher, D.O. Dr. Koher is licensed to practice medicine in the states of North Carolina and Pennsylvania. He was assisted by the following personnel:

Natasha Nikolich-Achterberg – Research Coordinator
Michael W. Maher – Research Coordinator
Miranda Clark – Research Assistant
Hank Gelatka – Research Assistant
Tracy Jenkins – Research Assistant
Blanche Koher – Research Assistant
John Talton – Research Assistant

All Research Team members listed successfully completed the following:

- National Institute of Health course, Protecting Human Research Participants
- MEP-90 System Orientation And Operation
- MEP-90A-CDA Clinical Protocol Execution

The Study Sponsor was Midwest RF, LLC¹⁰ of Hartland, WI. MWM Consulting LLC was the Study Monitor.

All screening and treatments were performed at the Koher Center For Hair Restoration located in High Point, NC.

¹⁰ Midwest RF, LLC is the designer and manufacturer of the MEP-90 systems used in the Study.

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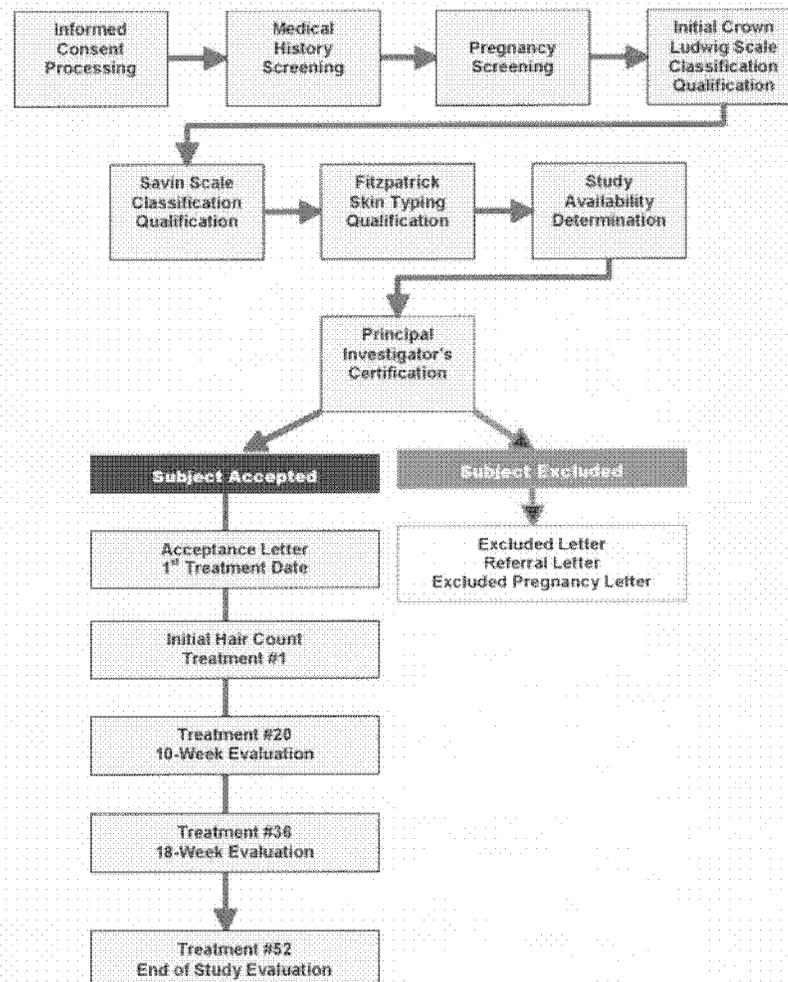
A total of three MEP-90 "prototype" systems were used for the treating of subjects. The MEP-90 is a "non-significant risk" (NSR) device consisting of 82 each lasers with wavelengths (l) of 650nm ($\pm 7.8\%$ measured). There were no operational changes, modifications, etc. to the systems throughout the course of the Study.

The Clinical Protocol approved by the IRB called for a 99%+ medical diagnosis accuracy of androgenic (androgenetic) alopecia. The term medical diagnosis consists of three basic components:

- 1) Medical History
- 2) Tests
- 3) Physical examination

In females, there are several forms of alopecia whose symptoms mimic those of androgenic alopecia. The symptomology of the disease, although different than males, negates a "placebo controlled" study due to the total lack of meeting the basic randomization and replication standards of statistics. This was our main source of disagreement with the Lexington study format.

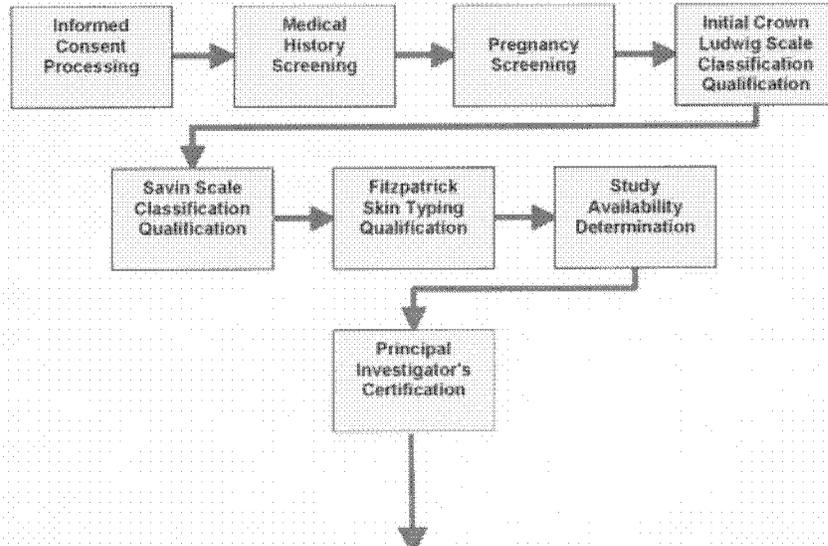
In our approved study, all subjects screened had to go through the following:



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Diagnostic and Acceptance Procedure Documentation



(b)(6)

Screening Record And Investigator Certification

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The "medical history" determination was made on adherence to the "Informed Consent" process as required by law. In addition, any "Yes" answer excluded them from the study, as it would challenge the accuracy of the medical diagnosis of androgenic alopecia:

(b)(6)

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The IRB approved radio and newspaper advertisements generated approximately 200 responses. 157 female subjects showed up for the screening process.

82 subjects met the criterion; those excluded were done so for:

- They failed to meet the Informed Consent mandates
- They answered "yes" to any question regarding their medical history
- They did not meet the testing standard with the Ludwig and/or Savin Scale
- They failed to meet the testing criterion with regards to Fitzpatrick Skin Typing
- They did not have androgenic alopecia based on physical examination

With six months of uncompensated twice-weekly participation it was expected there would be dropouts. The IRB approved a minimum of 50 patients, for all phases, was necessary to maintain statistical significance.

Although the start dates varied by subject, all subjects were scheduled to receive the full treatment protocol of 26 weeks, regardless of measurement results at the 10-week and 18-week milestones indicated. It was expected that the Study population would vary at each milestone due to dropouts and/or removals due to protocol restrictions and mandates. However, any and all data generated through a completed phase was included as part of the results obtained. For example:

Study Milestone	Population Completing Phase	Population Data Included In Results
Completed Phase 1 (10-Weeks and 20 Treatments)	63	63
Efficacy Determination (18-Weeks and 36 Treatments)	60	60
Completed Phases 1 & 2 (18-Weeks and 36 Treatments)	60	60
Completed Phases 1, 2, & 3 (26-Weeks and 52 Treatments)	55	55

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1-4. Phase 1 Method Of Analysis

A five-page analysis form was used to archive and evaluate all data acquired for each Subject at the end of Phase 1 (10-weeks/20 treatments). The review consisted of scoring of an objective criterion pertaining to all data accumulated including the questionnaire, crown photos, hair counts, and anagen hair counts.

(b)(6)

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1-5. Phase I Partial Results

→ 82 female subjects were accepted for the Study. The first treatment administered was on August 13, 2008. The last Phase I treatment was administered on March 3, 2009.¹¹ 19 additional subjects were excluded, after commencement of the Study and through the end of Phase I due to:

- Four failed to show for their first treatment
- 13 missed excessive appointments
- One was determined to have lichen planopilaris
- One decided to try to become pregnant

→ 63 subjects completed Phase I (10 Weeks/20 Treatments)

→ The 10-Week distribution of Subjects' hair growth results for Phase I:

Phase 1 Subject Hair Count Distributions	Number	Percentage
Hair growth between $\leq 1\%$ to 10%	5	8%
Hair growth between 11% to 20%	8	13%
Hair growth between 21% to 30%	12	19%
Hair growth between 31% to 40%	9	14%
Hair growth between 41% to 50%	8	13%
Hair growth $\geq 51\%$	21	33%
Total	63	100%

¹¹ Due to the further exclusions, an additional solicitation had to be conducted in December to insure a population of 50 or ≥ 50 .

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2-4. Phase 2 Method Of Analysis

A four-page analysis form was used to archive and evaluate all data acquired for each Subject at the end of Phase 2 (18-weeks/36 treatments). The review consisted of the scoring of an objective criterion pertaining to all data accumulated including the questionnaire, crown photos, hair counts, and anagen hair counts.

(b)(6)

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2-5. Phase 2 Partial Results

→ 63 female subjects began Phase 2 of the Study. Three (3) additional subjects were excluded after commencement of Phase 2 due to:

- One (1) dropped out due to scheduling conflict
- One (1) passed away whose cause of death was not related to the Study
- One (1) missed excessive treatments

→ 60 female subjects completed Phase 2 (18 Weeks/36 Treatments)

→ The 18-Week distribution of Subjects' hair growth results for Phase 2:

Phase 2 Subject Hair Count Distributions	Number	Percentage
Hair growth between $\leq 1\%$ to 19%	2	3%
Hair growth between 20% to 30%	5	8%
Hair growth between 31% to 40%	10	17%
Hair growth between 41% to 50%	9	15%
Hair growth $\geq 51\%$	34	57%
Total	60	100%



2-9. Appendix N – Phase 2 Hair Count Comparison

18-Week Hair Count Comparisons

Initial Hair Count	18-Week		Gain/Loss Percent	Hair Growth 220%	Hair Growth 520%	HG 20% To 20%	HG 40% To 31%	HG 50% To 41%	Hair Growth 251%	
	Hair Count	Hair Count								Gain/Loss
(b)(6)	78	109	31	40%	✓					
	103	138	35	34%	✓					
	52	114	62	119%	✓					
	64	121	57	89%	✓					
	11	22	11	100%	✓					
	92	139	47	51%	✓					
	95	117	22	23%	✓					
	57	91	34	60%	✓					
	22	29	7	32%	✓					
	65	98	33	51%	✓					
	82	174	92	112%	✓					
	105	141	36	34%	✓					
	41	102	61	149%	✓					
	59	131	72	122%	✓					
	80	117	37	46%	✓					
	82	111	29	35%	✓					
	85	132	47	55%	✓					
	102	134	32	31%	✓					
	42	60	18	43%	✓					
	77	109	32	42%	✓					
	77	110	33	43%	✓					
	81	148	67	83%	✓					
	109	134	25	23%	✓					
	77	123	46	60%	✓					
	85	158	73	86%	✓					
	87	144	57	65%	✓					
	95	188	93	98%	✓					
	65	111	46	71%	✓					
	76	120	44	58%	✓					
	95	127	32	34%	✓					
	95	146	51	54%	✓					
	62	77	15	24%	✓					
	103	151	48	47%	✓					
	63	95	32	51%	✓					
	67	93	26	39%	✓					
	92	105	13	14%	✓					
	60	92	32	53%	✓					
	91	129	38	42%	✓					
	114	154	40	35%	✓					
	85	133	48	56%	✓					
	39	48	9	23%	✓					
	101	131	30	30%	✓					
	90	125	35	39%	✓					
	79	117	38	48%	✓					
	121	154	33	27%	✓					
	71	102	31	44%	✓					
	75	145	70	93%	✓					
	100	200	100	100%	✓					
	84	103	19	23%	✓					
	98	153	55	56%	✓					
	82	179	97	118%	✓					
	95	210	115	121%	✓					
	88	114	26	30%	✓					
	88	140	52	59%	✓					
	62	92	30	48%	✓					
	134	190	56	42%	✓					
	85	117	32	38%	✓					
	102	153	51	50%	✓					
	58	133	75	129%	✓					
	93	181	88	95%	✓					
	82	232	150	183%	✓					
	Totals				58	2	5	10	9	34
	Percent				97%	3%	8%	17%	15%	57%

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Although it was not required with an initial 510(k) submission, I will respond to your item **K** below with the applicable excerpts from the Study:

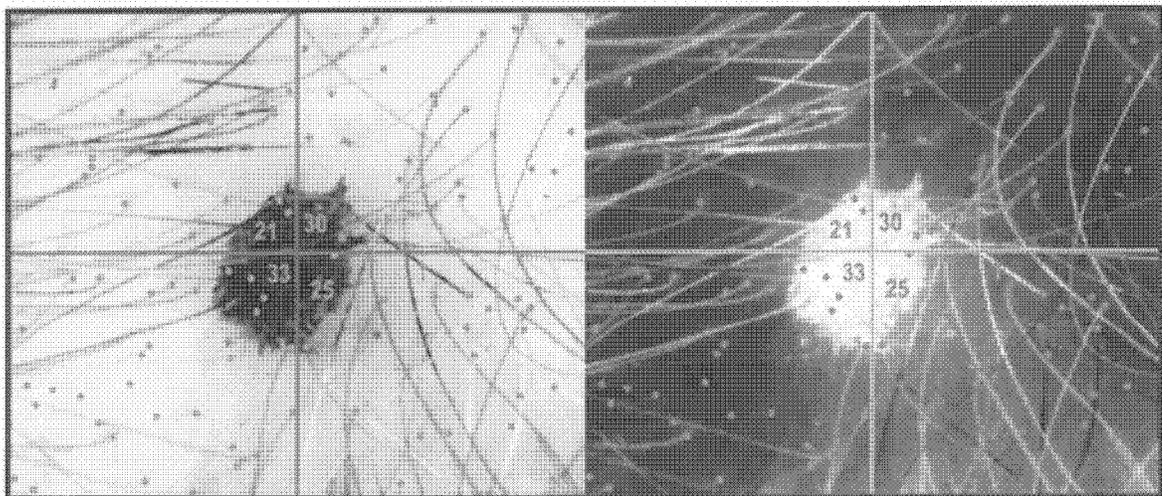
K• The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.

For global photographic requirements, a Toshiba digital still camera was used and immediately uploaded to the primary computer located at the clinical site.

For microscopic images, a Proscope HR with the 30N (30x) lens that included polarized white LED light source, which was non-reflective. This was used for all hair counts and provided a .95cm x .75 size image.

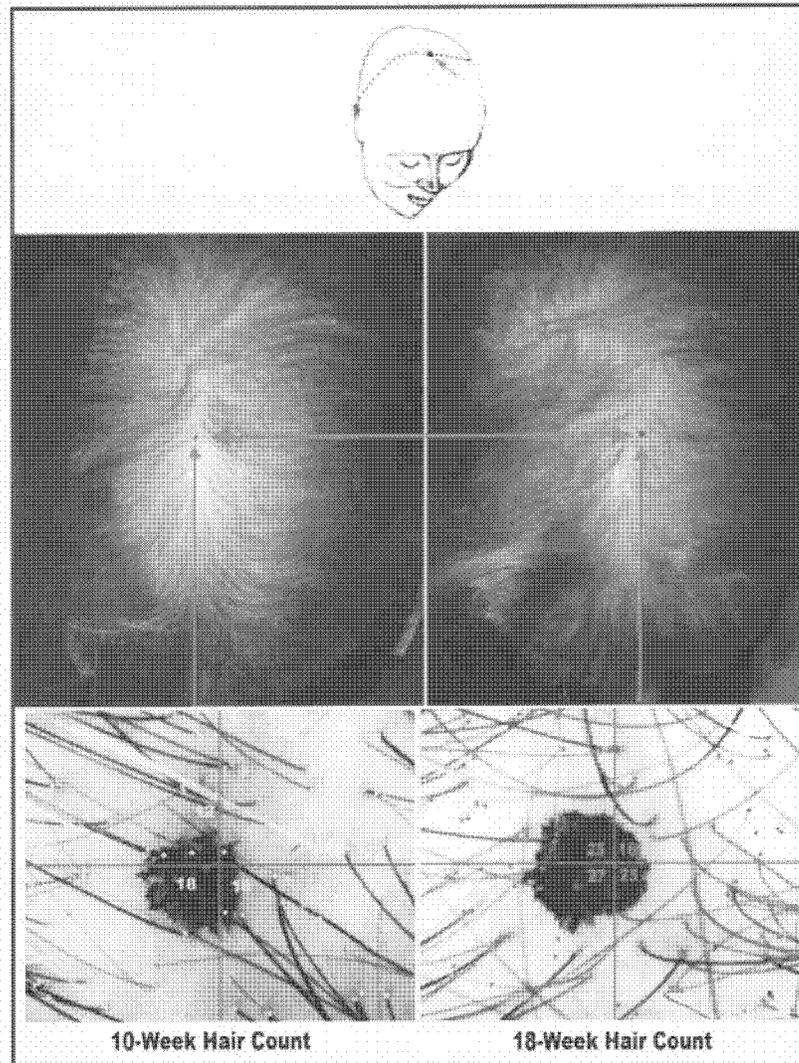
The microscopic imaging generated a raw image in "jpg" format. The raw image size generated was 17.778" wide by 14.222" tall with a dpi of 72. Using Adobe Photoshop v8.0, the microscopic photo sizes were changed to 6" wide by 4.81" tall with a dpi of 266. All raw images are archived in their original format with the processed images being archived using the "Save As" command.

No image software adjustments were made, the only processing capability used was to invert the image if the hair coloring required it for viewing the individual hairs.



oo oo oo oo oo

None of the women in the study were willing to receive a tattoo on the scalp in order to participate. Cutting and dyeing the hair was deemed not necessary. The method devised of marking the areas to be measured is as follows: sitting upright in a chair, head neutral position, eyes forward, a line drawn from the topmost portion of the pinna (ear) vertically over the scalp to the topmost portion of the opposite pinna (ear), intersected with a line drawn in the midline of the scalp, oriented from the glabella to the nuchal ridge. An indelible dot was placed at this intersection with a sharp tip permanent marking pen, which the subjects agreed to in their Informed Consent Form.



A series of 5 photos were taken with the dot in the center of the picture, as well as the upper right corner of the field, upper left, lower left, and lower right corner of the field. The hair counts were compared and averaged over the 5 photos. Three research assistants were responsible for all photos, were carefully instructed as to method, and were very meticulous in the taking of the photographs.

Even at that, we clearly recognize the possibility of small variations in the location of the intersecting lines, and subsequent marking position used to take the photographs. The author's position is that the averaging of hair counts in multiple photographs and the consistently significant improvement in hair counts across a 56 women patient population over a 12-month period, clearly validates the statistical results of the study.

The overwhelmingly positive self-assessment, albeit subjective, clearly supports the results, as does the fact that each participant received no compensation, and completed 52 treatments over 6 months. Anecdotal statements such as "I would never have continued this for 6 months if it wasn't working" became the slogan of the study.

E. Data Acquisition, Archiving, And Security

The data acquired during the Study was obtained through the screening questions' response, physical examination, photographic examination, subject questionnaires, global comparisons, and microscopic hair count comparisons.

This data included, but was not limited to:

- ≥ 157 formal 15-20 minute Informed Consent Presentations
- 157 formal 45-minute Clinical and Diagnostic Screenings
- Administration of over 3,350 treatments
- Generation and processing of over 2,550 global and microscopic images
- Generation and processing of 124 Subject Questionnaires
- Individual marking and counting of $\geq 35,000$ hairs

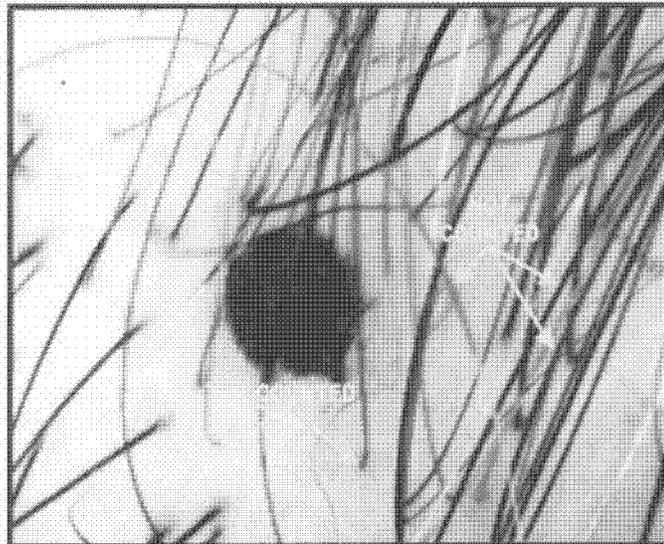
The data was archived in both hard copy and computer format. All hard copy items were sorted by Subject ID number and secured in a locked filing cabinet. The archiving software used was Filemaker Pro[®] v.7 which was password and access-level protected. A back-up software program, i.e., Personal Backup X5 was used to perform an automatic daily back up of all Study files to a separate hard drive. Weekly back-ups were performed by a Research Coordinator and kept off site under her direct control.

∞ ∞ ∞ ∞ ∞ ∞

1-3. Basic Hair Count Procedures – Initial And All Phases

Once the count photo was generated, a grid was superimposed on the image. A 20 pixel colored dot was place ONLY on those hairs that could be traced to a root located within the image. Hairs that could not be traced to their root were NOT counted. The analysis area was then broken down into four quadrants with the number of hairs per quadrant indicated on the image.

Some examples of those hairs "counted" and "not counted" are demonstrated below:





In **L** below, you infer you are asking a question, and then provide a biased and irrelevant determination, regardless of what the answer is:

- L** • The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

First, all screening and treatments were performed at the Koher Center For Hair Restoration located in High Point, NC.

Second, the subjects were treated with electromagnetic radiation with a measured wavelength (λ) between 650nm and 650.8nm. To insure proper statistical replication, IRB approved Study Staff administered all treatments. There is no known environmental exposure to the general population at this wavelength range, therefore geographical location is irrelevant. Your determination in **L** suggests that all medical studies must be conducted in every corner of the world to be valid. If that were true, the chemical composition of the water supply for taking any pharmaceutical would have to be considered as it varies from city to city.

Reference **M** below: As part of the IRB approved seven-page Informed Consent form and the medical history questions, there was no concurrent alternative therapy. One subject was later determined to have lichen planopilaris¹² and therefore had to be subsequently excluded because she had not meet the diagnostic criterion.

- M** • The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

¹² The hair loss from this affliction mimics androgenic alopecia in females. This still presented a 99% accuracy of our control group.

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We did not "suggest," we were point specific in our Indications of Use. "Adjuvant" primarily implies drug usage and/or the assistance by an injection for antigen stimulation. We made it clear that any other concurrent treatments would exclude them from the Study.

Again, an objective review of the Study itself would eliminate the need for **N** below.

N• The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

As you should be fully aware, the law and any sanctioned IRB mandates **any and all** adverse events must be addressed, no matter how serious or trivial they may seem to be. As part of the "replication" design of the Study, a record was kept of each subjects' treatment by date, treatment time, who administered the treatment, and any adverse effects reported.

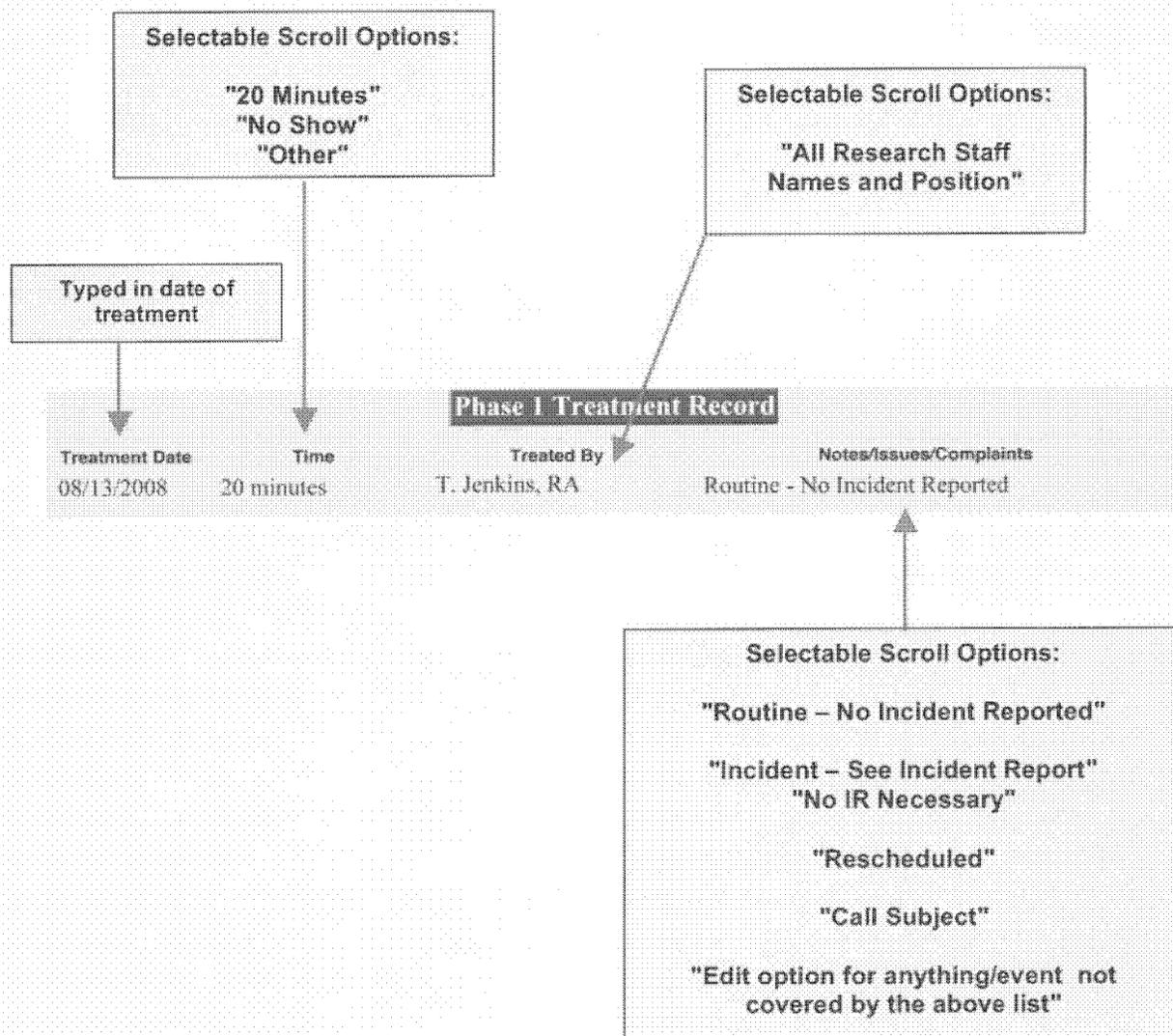
(b)(6)



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Using a "scroll down" type of selection menu for each of the four elements, the records kept were:



The database was "password protected" so the data could not be modified and/or changed at a later time. Both subjects and staff were informed; "no matter how trivial they thought anything was, to report it."

On the following page is a sample of one "Incident Report."

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MEP-90 Clinical Study Incident Report

Date of Incident: 10/17/2008	Site: High Point	Reported By: Blanche Kohler
Who Was Involved? <input type="checkbox"/> Subject <input type="checkbox"/> Staff <input checked="" type="checkbox"/> Other (Explain) <input type="checkbox"/> N/A Check (X) All That Apply		If Subject - Give ID# MEP- 261
Type of Incident: <input type="checkbox"/> Subject Complaint <input type="checkbox"/> In-Clinic Treatment <input type="checkbox"/> System Malfunction <input checked="" type="checkbox"/> Subject Comment <input type="checkbox"/> Hospitalization <input type="checkbox"/> System Failure <input type="checkbox"/> Injury <input type="checkbox"/> Follow-Up Treatment Required <input type="checkbox"/> Recommendation <input type="checkbox"/> Emergency Response <input type="checkbox"/> Death <input type="checkbox"/> Other (Explain) Check (X) All That Apply		
Explanation: Patient came to the office and wanted us to note that in the first 10 - 12 days of the laser treatments she notice an increase in scalp and facial oil. She is now onto her 14th laser treatment and the scalp and facial oil has resolved.		
Is Follow-Up Required? <input type="radio"/> Yes <input checked="" type="radio"/> No	Priority: <input type="radio"/> Immediate <input type="radio"/> 14 Days <input type="radio"/> 30 Days <input checked="" type="radio"/> Info Only	
If Follow-Up is required and it is a Priority of Immediate or 14 Days, save as a PDF file and email immediately to: mwmconsult@yousg.net <input type="button" value="Save As PDF File"/>	Print 2 copies of all reports. Place one copy in Incident Report Log and distribute the other to the Principal Investigator. <input type="button" value="Print"/>	

It was adherence to the IRB approved protocol that determined whether a subject had to be removed for non-compliance and nothing else. All facets of the Study were approved by the IRB prior to commencing even the first advertisement.

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We would like to know the specific regulation that allows you to insinuate multiple criminal allegations of noncompliance to the "Truthful and Accurate" statement and the cancellation of an IRB sanctioned study without any objective review of the entire study?

We would like to know the source of your information for your determinations of inaccuracy and Study statistical insignificance that you presented that were not in our 510(k) submission, no FDA inspection of our facility occurred, no FDA inspection of the clinical site occurred, no FDA contact of the Study's monitor occurred, no FDA contact of the WIRB® occurred that we were made aware of, and/or no review of the Study documentation occurred?

As stated previously stated, we have absolutely no objection to the FDA reviewing any and/or all portions of the Study data. We made it very clear in our 7-page Informed Consent Form that the FDA has a right to review personal data:

PROCEDURES

The study doctor or staff will examine you to see if your hair growth problem qualifies for participation in this study. You will be asked questions about your health and about any medications you have taken, or are currently taking, to try and help hair growth. Photographs of your scalp and hair will be taken at the start of the study and again at Week 10, 18, and 26.

Before starting the light therapy procedures, a reference mark will be put on the crown area of your head. It will be applied with indelible ink and will be no larger than a pinhead (*). Occasionally during the study, we may need to remark the same spot. We ask that you use only the specific hair shampoos and conditioners recommended by your study doctor.

You will have 2x 20-minute treatments with the investigational device. This will be repeated for 26 consecutive weeks. Each procedure will be separated by at least two days but not more than six days.

All records and data will remain confidential according to current federal and state privacy laws and regulations. However, absolute confidentiality cannot be guaranteed. The Food and Drug Administration may inspect only the records obtained from this study and they will maintain your personal privacy.

Your participation is voluntary. You may discontinue your participation at anytime, totally at your discretion, and without any adverse (bad or harmful) effects.

As I also relayed to the CDRH Ombudsman, I have no intention of committing Midwest RF to a marketplace where clinical efficacy cannot be validated. The nature of androgenic alopecia requires us to provide explicit training of all users in proper diagnostic procedures, treatment protocol, and success/failure measurement.

27,000,000 women in the United States are afflicted with this treatable, but incurable, disease. Lasers at the wavelengths we use, generate a physiological response in the body as does most forms of electromagnetic radiation. That obviously mandates the classification of any type of device such as the MEP-90 as a medical device.

We are fully aware of the lack of regulatory oversight of this industry, which is why we made sure we followed strict adherence to all scientific and regulatory requirements.



Whereas we are aware that your office is not responsible for enforcement, please understand our confusion when we follow all procedures to the letter, but the FDA allows the following:

Save \$100s, Even \$1,000s Now!
Professional Hair Loss Treatment
Laser Units Now at HUGE SAVINGS!

All units Operate at Optimal 650 NM Lasers

90-Laser Overhead Unit
Now, ONLY \$1295.00
(Comparable units sold by other manufacturers for \$1000 to \$2000)

Single-Panor 60 Laser Unit
Now, ONLY \$395.00
(Comparable units sold by other manufacturers for \$200 to \$300)

Overhead 60 Laser Unit
Now, ONLY \$395.00
(Comparable units sold by other manufacturers for \$200 to \$300)

Free-standing 5-Panor Laser Unit
Now, ONLY \$395.00
(Comparable units sold by other manufacturers for \$10 to \$20000 to \$50000)

FEATURES INCLUDE: "Space saving" adjustable stand which can easily be moved from room to room. Two, four and five panel adjustable laser units for maximum coverage of treatment areas, maximum strength at 650 NM lasers.

- Laser stops 95% of hair loss (U.S. FDA Statistics)
- Laser stimulates 93% new hair growth (U.S. FDA Statistics)
- Improves 78% hair condition and preserves color

NOW ACCEPTING ORDERS
CALL TODAY!
626-276-7012
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ALL AMERICAN CREDIT CARDS

All units are made in the USA and come with 30-day MONEY-BACK GUARANTEE (Custom unit design and branding available)

EMAIL: TheLaserGroup@gmail.com

LOOK FOR LASER EQUIPMENT WEBSITE SOON!

We are committed to be totally cooperative with the FDA, however we feel our submission has yet to receive an objective review in accordance with the mandates of 21CFR. Should you have any clarification needs, please feel free to contact me at anytime.

Respectfully yours,

Midwest RF LLC

Helmut Keidl
President

cc: Les Weinstein; CDRH Ombudsman

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(262) 367-8254 • fax (262) 367-8544

K091496/12

September 30, 2009

Food and Drug Administration
Center For Devices and Radiological Health
Document Mail Center (HFZ-401)
9200 Corporate Boulevard
Rockville, MD 20850

FDA CDRH DMC

OCT 02 2009

Received

ATTN: LTJG Atiq Chowdhury

**Subject: Response to Your 9/10/09 Letter Referencing 510(k) Submission K091946
Responses To Our Teleconference Of September 17, 2009**

Dear LTJG Chowdhury:

I am in receipt of your email and attachment titled "K091496 - AI_S1 (1).doc" of September 10th. I also wanted to express my appreciation for the teleconferencing session, with FDA Staff, on September 17, 2009.

My staff and I reviewed the two items above, along with all the correspondence between Midwest and the FDA to date. Please consider this correspondence as the response to your requests. Furthermore, to avoid any confusion, I have incorporated the contents of my six page email response dated September 14, 2009 into this document.

My staff and I interpreted our teleconference discussions to indicate no unresolvable issues and/or disagreements concerning the MEP-90 remain on our part. We did interpret your letter and the discussions to indicate your request(s) for several specific and additional documents pertaining to the Study, and certain responses to the issues we discussed.

Since your requests for additional data includes several significantly sized documents, I have prepared a "Table of Contents" for your ease of reference and use, which is located on Page 2. Please review and let me know immediately if we have misinterpreted and/or missed anything.

Respectfully yours,

Midwest RF LLC

Helmut Keidl
President

cc: Les Weinstein: CDRH Ombudsman

K 26

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Point-By-Point Response To Your Letter of September 10, 2009

Page 2; ¶2 Issue:

- A. Please provide a revised Device Comparison Table which contains a side-by-side comparison of the subject device to the predicates in the areas of Indications of Use (which is reflective of the Indications for Use Statement), Wavelength Range, Energy Range, (J/cm²), Pulse Duration (µs), and Pulse Rate (Hz), Sterilization, and Materials. Also, please include a response where the areas of comparison may not apply directly to the subject device (i.e. For Pulse Duration and Pulse Rate state Continuous Wave or CW, for sterilization state non-sterile).

Response: Please refer to our revised Device Comparison Table.

Page 2; §6 continued thru Page 3; ¶1 Issue:

Comment 1: There was no concurrent control or sham arm in this trial. In addition, the investigative staff and patients were aware of the treatment being performed. As a result, it is not possible to account for a possible bias in assessments, nor for the possibility that some portion of the observed improvement in hair count or lessening of rate of hair loss over time is due to natural causes unrelated to treatment.

Response(s): As I stated in my attachment of September 14th, I never intended for you to interpret our response to be a formal challenge of the legitimacy for a "double-blind, sham-control, and randomized clinical study" (placebo study). Based on the content of your September 10th letter, I can see where you did, and for that I again apologize.

My intent was to put forth the rationale of a placebo study would not provide the necessary information for legitimate FDA approval, meeting EBM criterion, and would be extremely burdensome to the subjects, if not totally impossible to legitimately execute. Even if we somehow had successfully executed a placebo study, all we would have is data comparing the MEP-90's performance to "chance."

Before I would ever commit Midwest RF, or any other of the Midwest Group companies to any endeavor, it has to be based on far more than "chance." I wanted to know exactly what we would be getting into; therefore I sought out an Institutional Review Board (IRB) for guidance and oversight.

To achieve this end, I knew our efforts had to be didactic in nature. That is we also needed to determine what was required to support this product beyond just the design compliance to the safety and performance standards of 21CFR Part 1010 and SE.

Except for age and pregnancy, the medical history, the Ludwig Scale, and the Savin Scale established the "control group" by eliminating all variables (bias), which could have contributed to errors in assessment whether that would be in the diagnosis or the observed results.

There is no natural phenomenon, or other natural cause(s), which impacts hair growth on this disease as classified by the World Health Organization (WHO) of which the United States is a member nation. In addition, androgenic (androgenetic) alopecia in women is a chronic genetic disorder. CDRH regulates "radiation emitting devices" like those Class IIIa (Class IIIr) lasers in the MEP-90 which generate an energy related reaction on tissue and cells within the human body, which is undoubtedly why they are regulated by CDRH. This makes all these devices actual medical

devices and not cosmetic improvement devices. This is also confirmed in the response to "Page 8; ¶1 Response.

Unlike the Study concerning K060305, we administered all treatments on the subjects versus assuming that the subjects rigidly adhered to the usage called for in the enclosed documentation, which is a possible bias based on improper usage of K060305. All subjects formally acknowledged their prohibition of usage of any chemicals and/or other treatments during the course of the Study.

Page 4; ¶3 Issue:

Comment 2: (a) A large proportion of subjects screened were not accepted (82 accepted out of 157 screened). It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled. (b) In addition, of the 82 meeting eligibility criteria and accepted, only 63 were assessed at the 10 week follow-up, and only 60 at the 18 week assessment. The remaining 19 subjects were not treated as missing subjects, but simply excluded from the analysis. (c) It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, (d) in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

(a) A large proportion of subjects screened were not accepted (82 accepted out of 157 screened). It is unclear why the remaining 75 subjects (48% of the total screened) were not enrolled.

Response(s): Originally it was planned that we would commence the actual study upon obtaining 80(±5) qualified subjects. Due to advertising restrictions, the acquisition of qualified subjects was much slower than anticipated.

The IRB approved a targeted Study population of 80, with the restriction of no less than 50 for each phase. The first individual screened was on June 27, 2008.

Whereas it was assumed the first treatment date would be in early July 2008, the first treatment was not administered until August 12, 2008. Due to IRB restrictions in advertising, our prohibition of any and all compensation being given to the subjects (a definite bias), and timing some already approved subjects dropped out before the Study (first treatments) began.

Since your letters, another and more comprehensive audit was conducted of all "Screening Files." Several discrepancies were found, however none of those discrepancies involved the obtained Study data published. As stated, the screening process could not and did not begin until after receipt of the Study's Certificate of Approval by the IRB (June 2008).

The results of the more detailed and comprehensive audit were as follows:

Total Responses To Newspaper/Radio Advertising	212
Total "Screening" records generated	245
Total "Screening" Records Not Used (Blanks).....	33
Total "Screening" Records Generated For Appointments But Did Not Show	41
Total Screening Records Utilized	171

215

As previously stated, the files were limited in access and deletion required a specific password. To track advertising results, a new file was generated if a response (phone call) was received. If they were determined to be unqualified during the phone call, these became "Screening" Records Not Used (Blanks).

If the potential subject made an appointment, but did not show up for screening, they were classified as "Screening" Records Generated For Appointments But Did Not Show.

In accordance with HIPAA, names were not recorded unless candidate showed up for screening.

171 potential subjects had Screening forms generated. 82 of the potential subjects were excluded based on the following:

Total Screened	171
Excluded For Informed Consent Issues	5
Excluded For Medical History Issues	57
Excluded For Ludwig and/or Savin Scales Issues	14
Excluded For Fitzpatrick Skin Typing Issues	2
Excluded For Physical Examination Issues	4
Total Subjects Who Met Criterion For Study	89

Each of the subjects "excluded" were sent a letter indicating they did not meet the Study criterion. There were no letters sent neither regarding a possible pregnancy nor referring them to their personal physician based on findings in the physical examination as called for in the protocol if warranted.

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)		1		1			
		1		1			
		1		1			
		1		1			
		1		1			
		1	1				
		1		1			
		1		1			
		1		1			
		1		1			
		1					1
		1				1	
		1		1			
		1		1			

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)		1		1			
		1			1		
		1		1			
		1			1		
		1		1			
		1			1		
		1		1			
		1				1	
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		1				1	
		1		1			
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		1					1
		1				1	
		1		1			
		1					
		1	1				
		1			1		
		1			1		

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)		1					1
		1		1			
		1		1			
		1					
		1		1			
		1				1	
		1	1				
		1			1		
		1			1		
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		1			1		
		1			1		
		1			1		
		1					
		1			1		
		1				1	
		1			1		

203

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination
(b)(6)		1			1		
		1			1		
		1		1			
		1		1			
		1		1		1	
		1		1			
		1		1			
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		1		1			1
		1		1			
		1		1			
		1		1			

ID#	Last Name	Screened But Excluded	Excluded For Informed Consent	Excluded For Medical History	Excluded For Ludwig/Savin	Excluded For Fitzpatrick	Excluded By Physical Examination								
(b)(6)															

Phase 1 Results:

No.	ID#	Initial	10-Week	Gain/Loss	Gain/Loss Percent	Hair	Hair
		Hair Count	Hair Count			≥10%	≥20%
(b)(6)		78	104	26	33%	✓	✓
		103	138	35	34%	✓	✓
		52	149	97	187%	✓	✓
		64	100	36	56%	✓	✓
		11	33	22	200%	✓	✓
		92	136	44	48%	✓	✓
		55	74	19	35%	✓	✓
		57	96	39	68%	✓	✓
		22	29	7	32%	✓	✓
		65	51	-14	-22%		
		82	131	49	60%	✓	✓
		105	121	16	15%	✓	✓
		41	87	46	112%	✓	✓
		59	107	48	81%	✓	✓
		80	114	34	43%	✓	✓
		82	91	9	11%	✓	✓
		65	92	27	42%	✓	✓
		102	121	19	19%	✓	✓
		42	54	12	29%	✓	✓
		77	122	45	58%	✓	✓
		77	98	21	27%	✓	✓
		81	131	50	62%	✓	✓
		109	135	26	24%	✓	✓
		77	112	35	45%	✓	✓
		85	132	47	55%	✓	✓
		81	116	35	43%	✓	✓
		95	134	39	41%	✓	✓
		65	81	16	25%	✓	✓
		76	90	14	18%	✓	✓
		95	99	4	4%		
		95	165	70	74%	✓	✓
		52	72	20	38%	✓	✓
		103	161	58	56%	✓	✓
		63	110	47	75%	✓	✓
		67	84	17	25%	✓	✓
		92	101	9	10%	✓	✓
		80	113	33	41%	✓	✓
		81	99	18	22%	✓	✓
		114	114	0	0%		
		85	90	5	6%		
		39	66	27	69%	✓	✓
		101	103	2	2%		
		99	151	52	53%	✓	✓
		65	89	24	37%	✓	✓
		79	100	21	27%	✓	✓
		121	147	26	21%	✓	✓
		44	58	14	32%	✓	✓
		75	119	44	59%	✓	✓
		100	128	28	28%	✓	✓
		84	97	13	15%	✓	✓
		98	126	28	29%	✓	✓
		82	147	65	79%	✓	✓

No.	ID#	Initial	10-Week	Gain/Loss		Hair	Hair
		Hair Count	Hair Count	Gain/Loss	Percent	Growth	Growth
						≥10%	≥20%
(b)(6)		95	154	59	62%	✓	✓
		88	104	16	18%	✓	✓
		88	133	45	51%	✓	✓
		62	82	20	32%	✓	✓
		134	161	27	20%	✓	✓
		85	104	19	22%	✓	✓
		55	79	24	44%	✓	✓
		102	132	30	29%	✓	✓
		58	137	79	136%	✓	✓
		93	130	37	40%	✓	✓
	82	170	88	107%	✓	✓	
Totals						58	50
Percent						92%	79%

The Study's criterion called for uninterrupted treatments which are no different than certain antibiotics and/or other medical treatments that mandate full adherence to dosage regarding amounts and over a designated period of time.

(c) It is possible that some of the participants who discontinued treatment via drop out or missed appointments did so due to a lack of effectiveness, (d) in which case the effectiveness estimates provided by the sponsor could be dramatically overestimated.

Response: As was previously stated, 63 subjects commenced Phase 2 (18 Weeks) of the Study, with 60 of them completing Phase 2 (18 Weeks).

Subjects Who Started Phase 2 of Treatments	63
(b)(6)
Subjects Who Completed Phase 2 of Treatments (18 Weeks)	60

The efficacy data for the 510(k) submission was based on the subjects adherence to the protocol mandates. There was no overestimation as at the end of 10-weeks, the dropped subjects had attained:

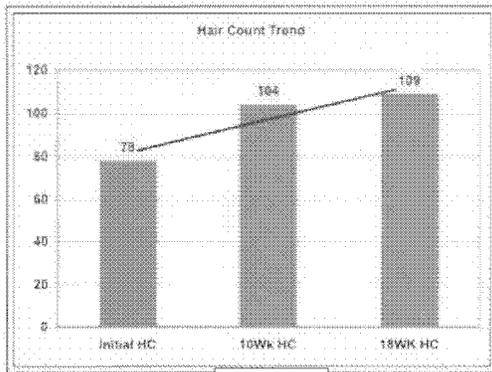
- (b)(6)
-
-

Phase 2 Results:

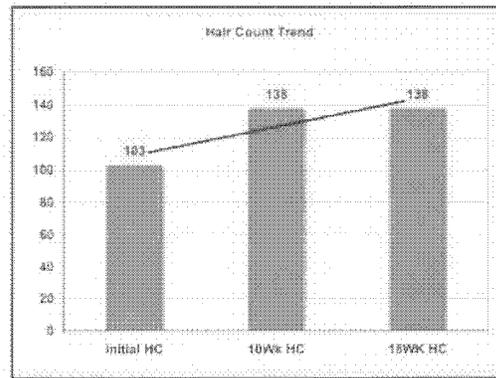
No.	ID#	Initial	Gain/ Loss	Gain/ Loss %	Hair Count ≥20%	Hair Count ≤20%	HC	HC	HC	Hair Count ≥51%
		Count					18-Week Hair Count	20% To 30%	31% To 40%	
(b)(6)	78	109	31	40%	✓					
	103	138	35	34%	✓					
	52	114	62	119%	✓					
	64	121	57	89%	✓					
	11	22	11	100%	✓					
	92	139	47	51%	✓					
	55	117	62	113%	✓					
	57	91	34	60%	✓					
	22	29	7	32%	✓					
	65	98	33	51%	✓					
	82	174	92	112%	✓					
	105	141	36	34%	✓					
	41	102	61	149%	✓					
	59	131	72	122%	✓					
	80	117	37	46%	✓					
	82	111	29	35%	✓					
	65	132	67	103%	✓					
	102	134	32	31%	✓					
	42	60	18	43%	✓					
	77	109	32	42%	✓					
	77	110	33	43%	✓					
	81	148	67	83%	✓					
	109	134	25	23%	✓					
	77	123	46	60%	✓					
	85	156	71	84%	✓					
	81	144	63	78%	✓					
	95	186	91	96%	✓					
	65	111	46	71%	✓					
	76	120	44	58%	✓					
	95	127	32	34%	✓					
	95	146	51	54%	✓					
	52	77	25	48%	✓					
	103	151	48	47%	✓					
	63	95	32	51%	✓					
	67	93	26	39%	✓					
	92	105	13	14%	✓					
	80	92	12	15%	✓					
	81	129	48	59%	✓					
	114	154	40	35%	✓					
	85	133	48	56%	✓					
	39	48	9	23%	✓					
	101	131	30	30%	✓					
	99	Deceased	After	Phase 1						
	65	125	60	92%	✓					
	79	117	38	48%	✓					
	121	154	33	27%	✓					
	44	Dropped	Out	After	Phase 1					
	75	145	70	93%	✓					
	100	230	130	130%	✓					
	84	103	19	23%	✓					
	98	153	55	56%	✓					
	82	170	88	107%	✓					
	95	210	115	121%	✓					

No. ID#	Initial Hair Count	18-Week Hair Count	Gain/Loss	Gain/Loss %	Hair Growth ≥20%	Hair Growth ≤20%	HG 20% To 30%	HG 31% To 40%	HG 41% To 50%	Hair Growth ≥51%
(b)(6)	88	140	52	59%	✓					
	62	92	30	48%	✓					
	134	190	56	42%	✓					
	35	Removed	Missed	Treatments						
	55	117	62	113%	✓					
	102	153	51	50%	✓					
	58	133	75	129%	✓					
	93	181	88	95%	✓					
	82	232	150	183%	✓					
Totals					58	2	5	10	9	34
					% = 97%	3%	8%	17%	15%	57%

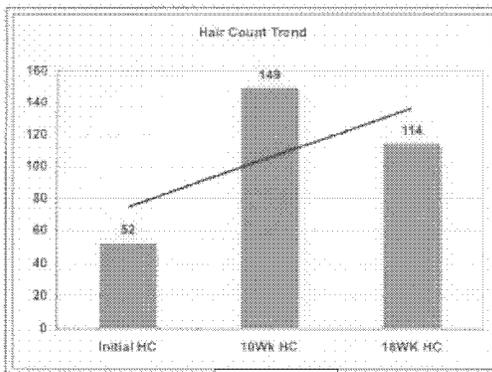
Phase 2 Historical Linear Trends



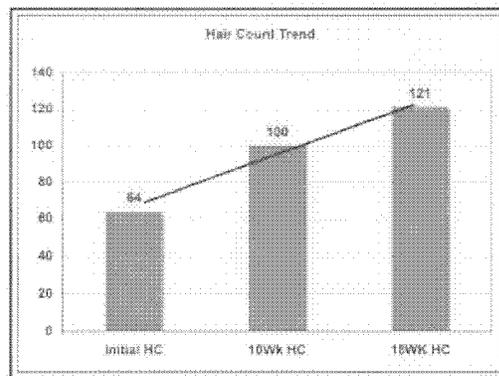
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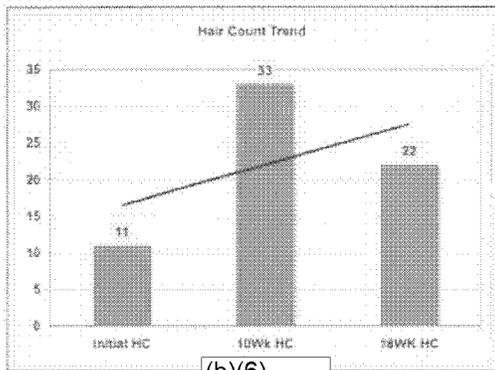
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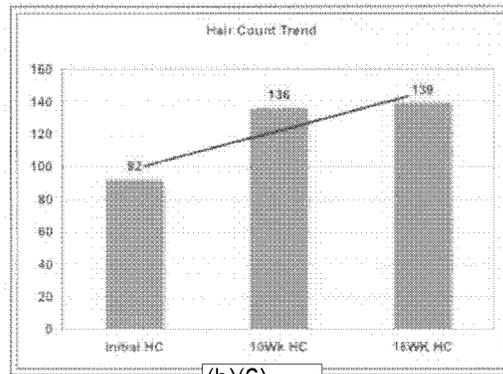
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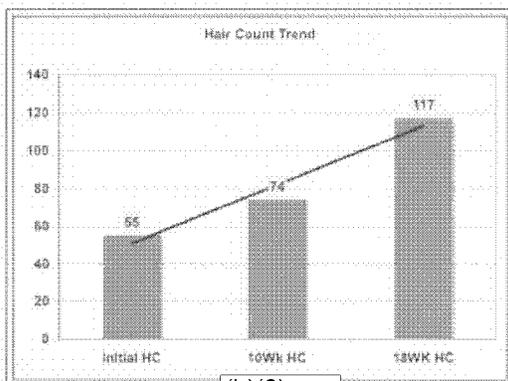
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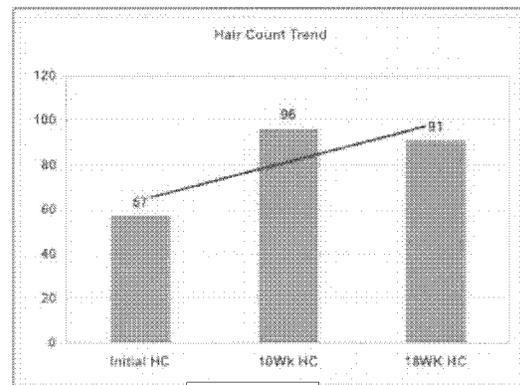
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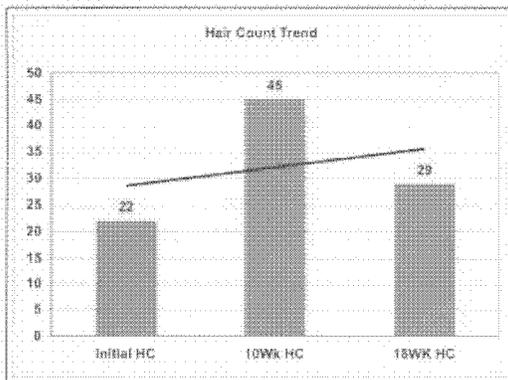
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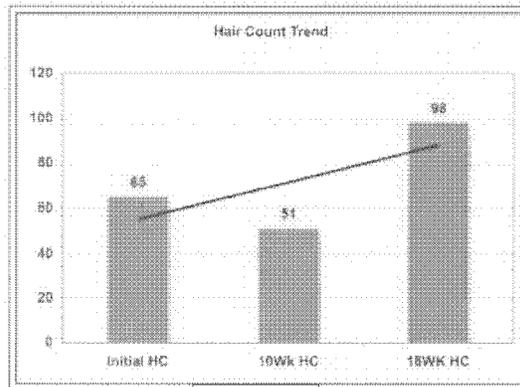
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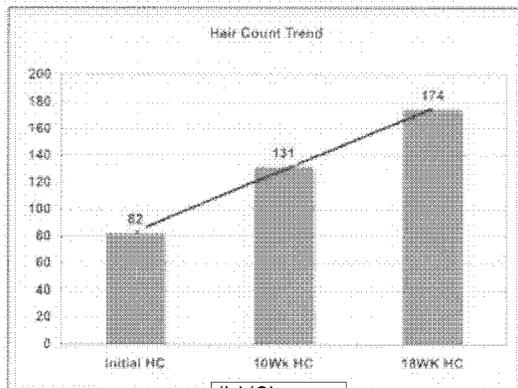
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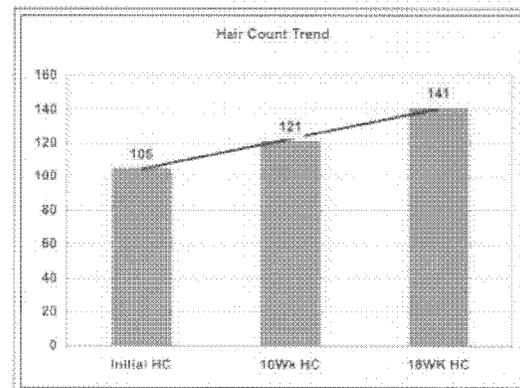
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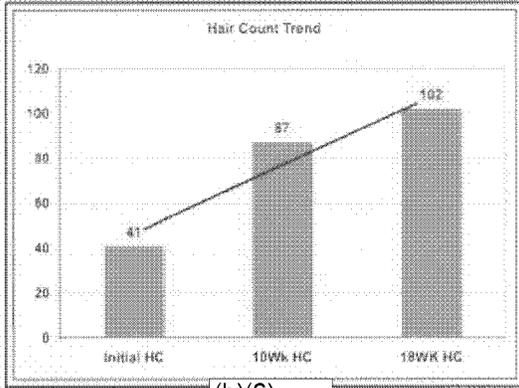
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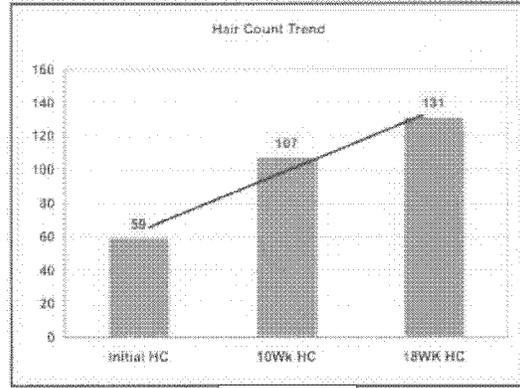
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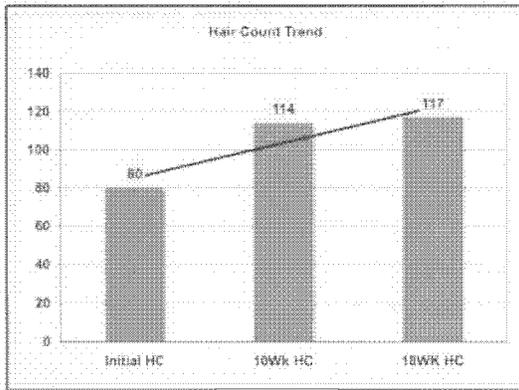
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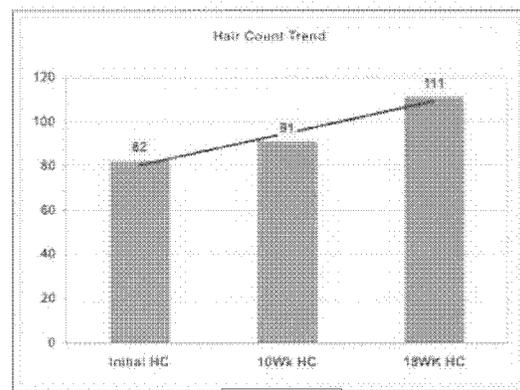
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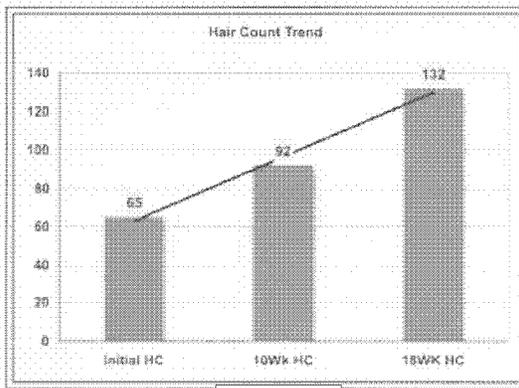
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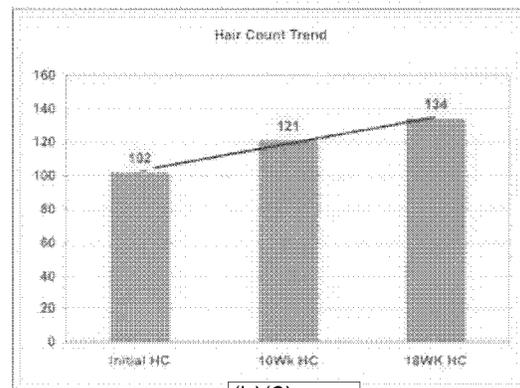
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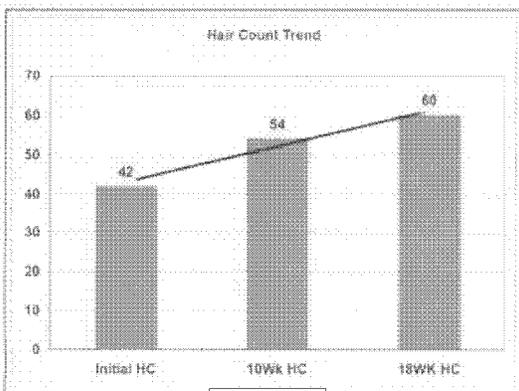
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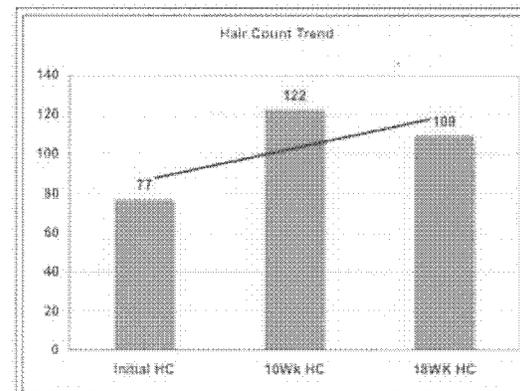
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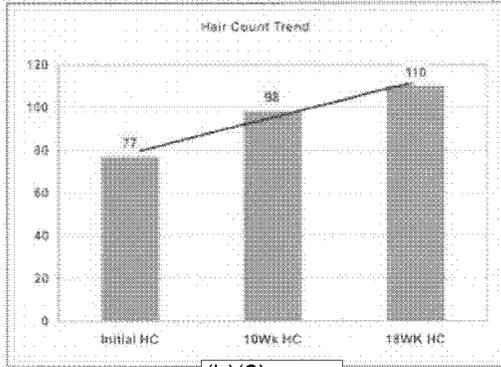
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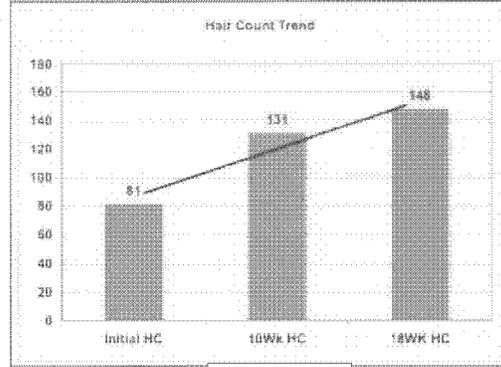
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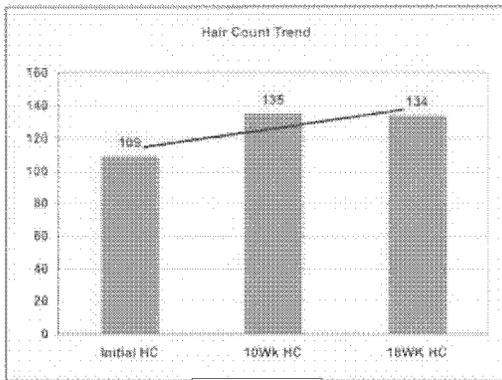
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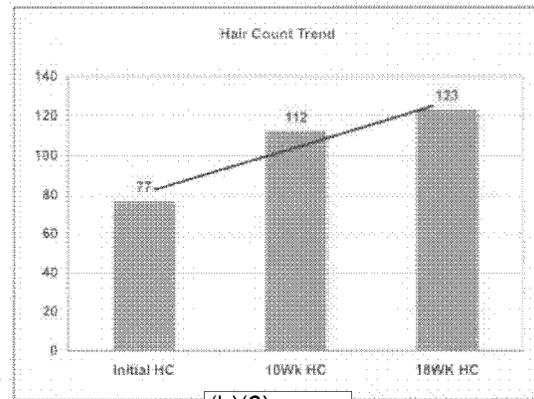
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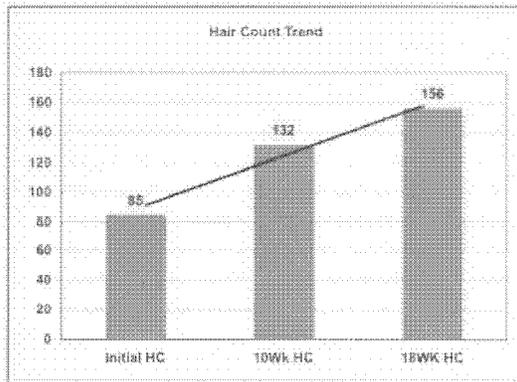
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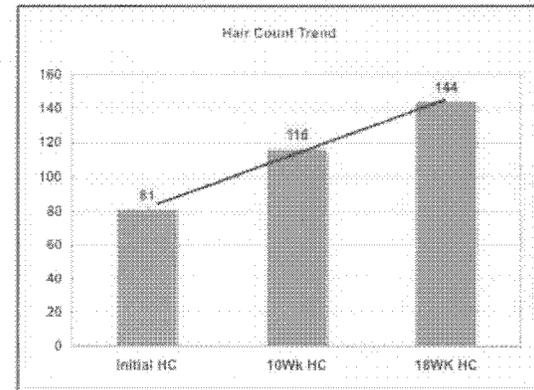
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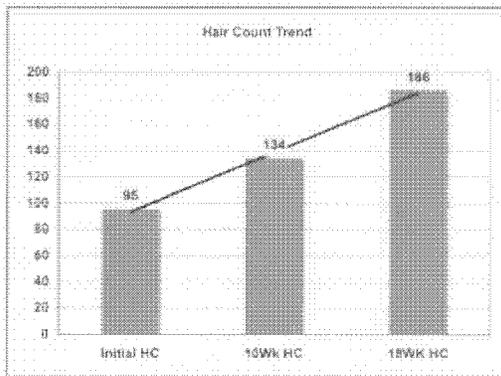
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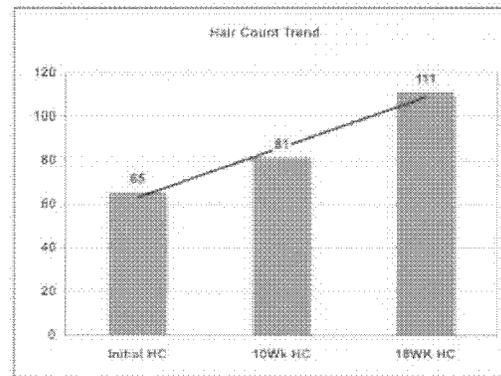
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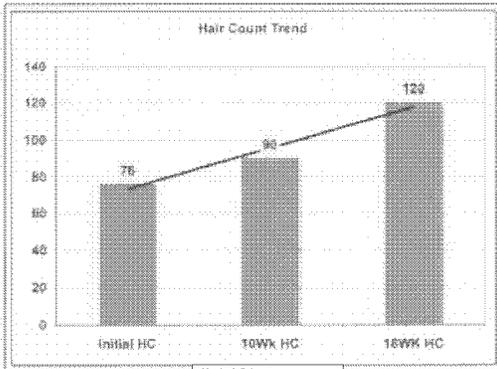
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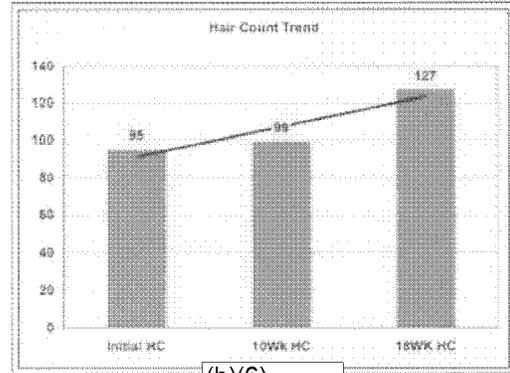
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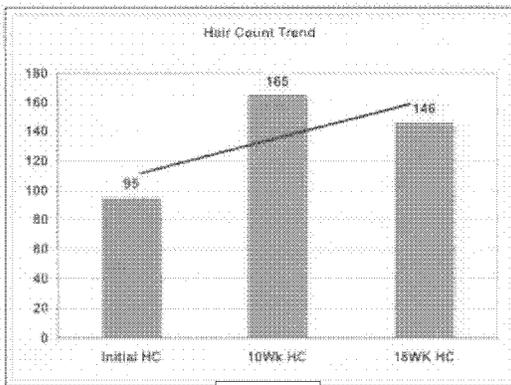
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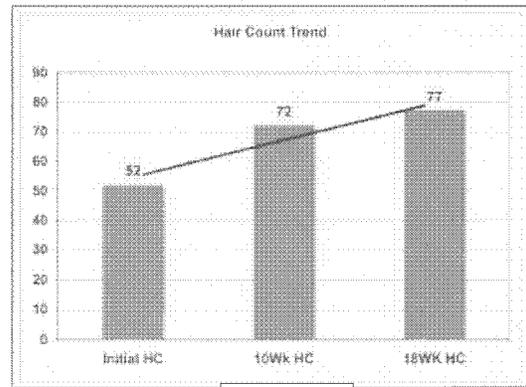
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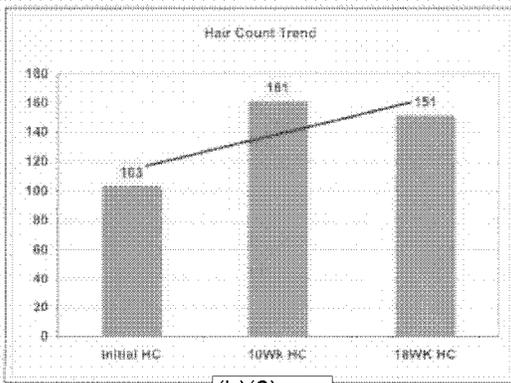
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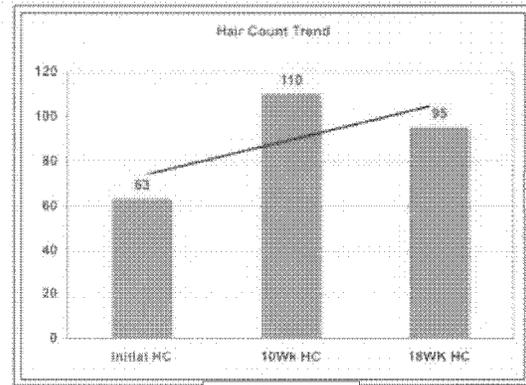
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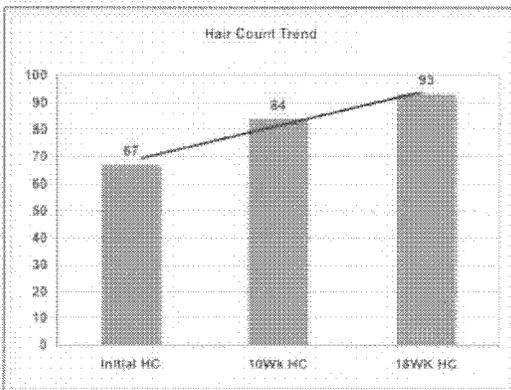
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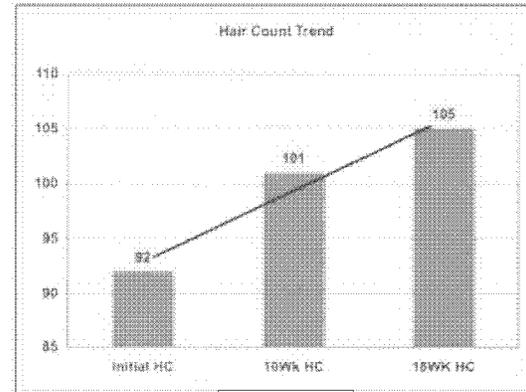
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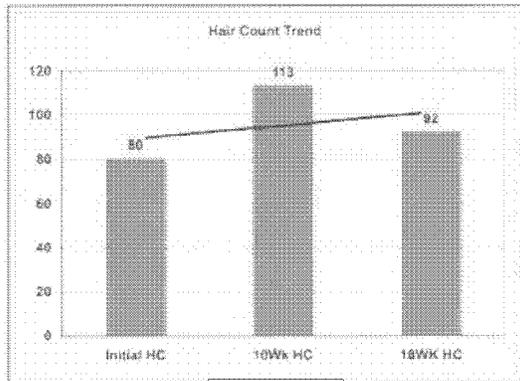
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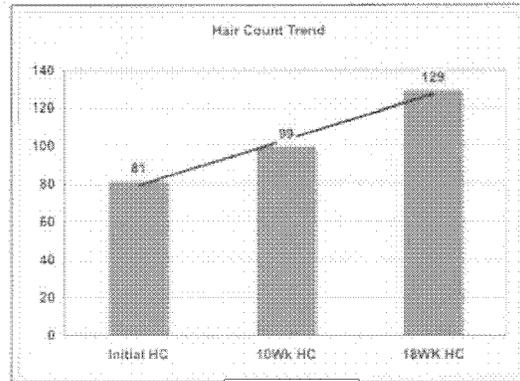
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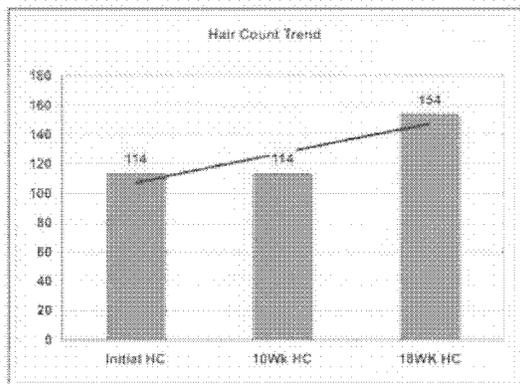
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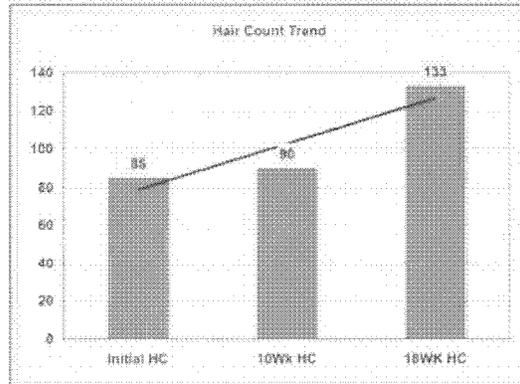
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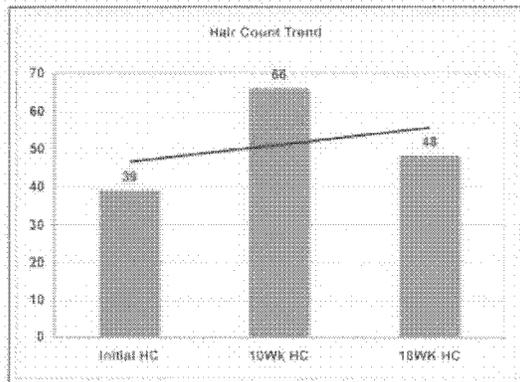
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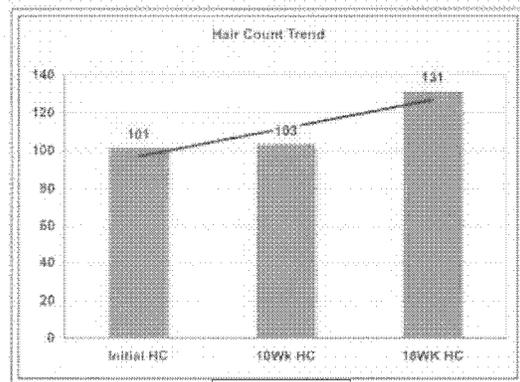
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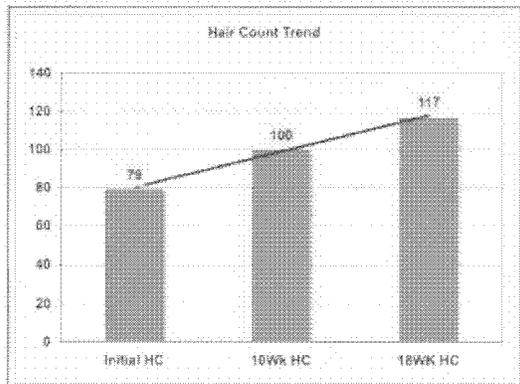
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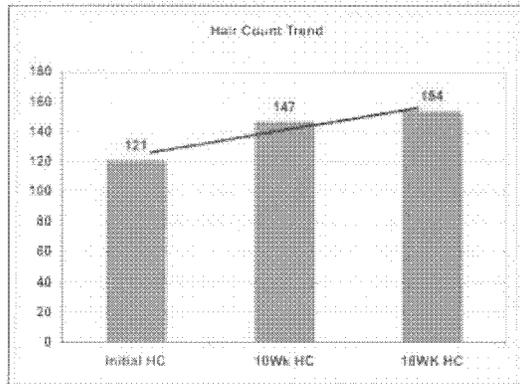
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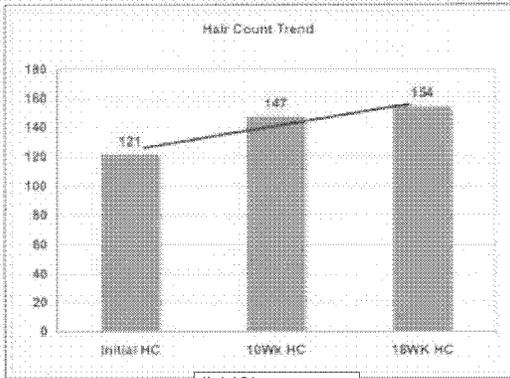
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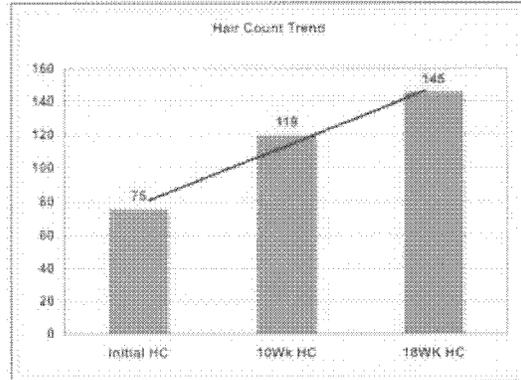
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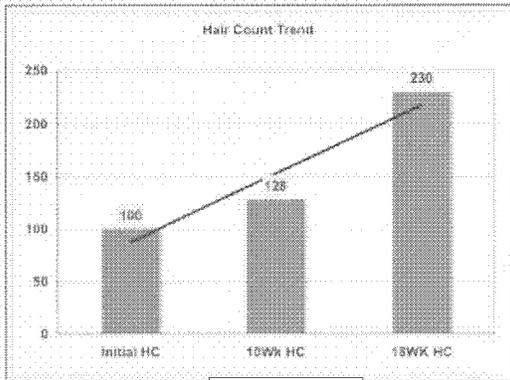
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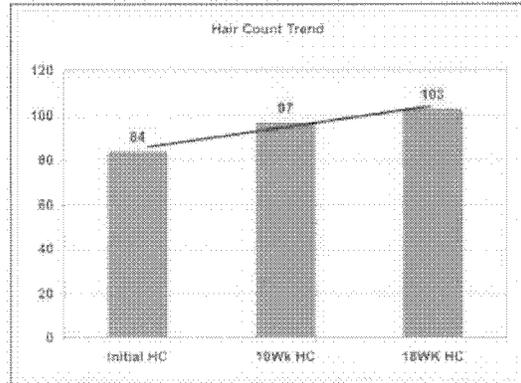
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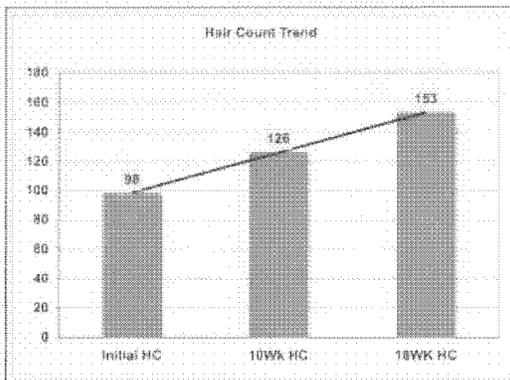
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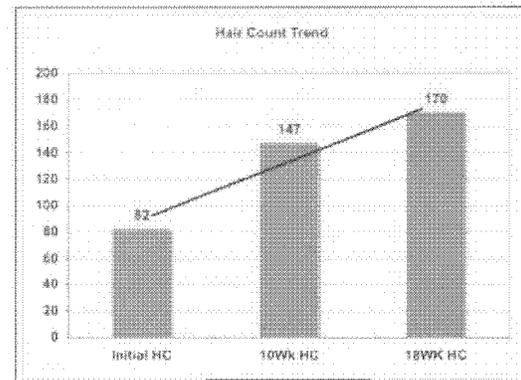
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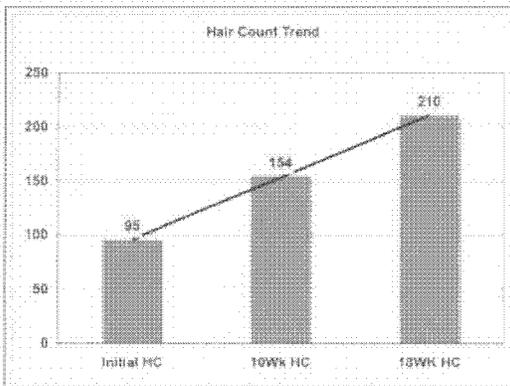
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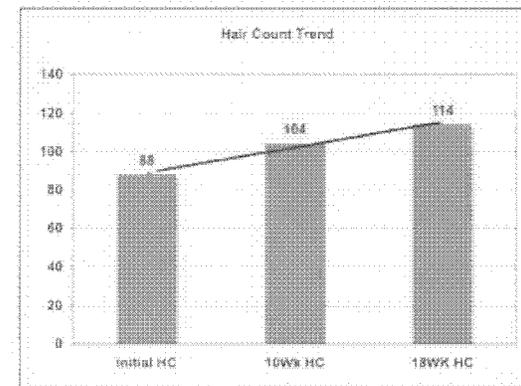
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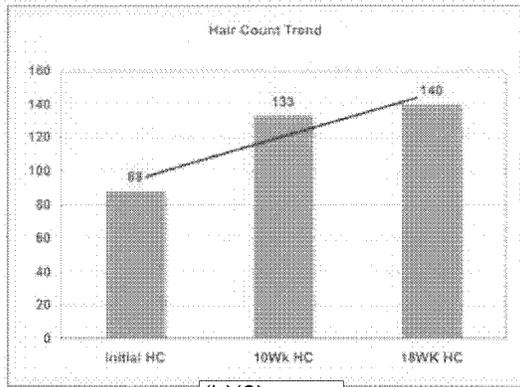
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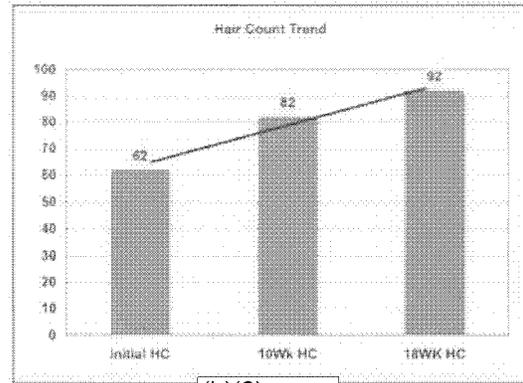
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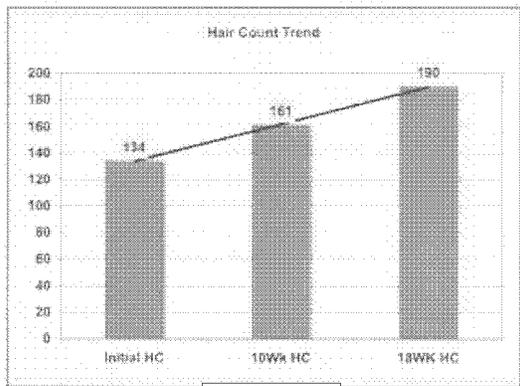
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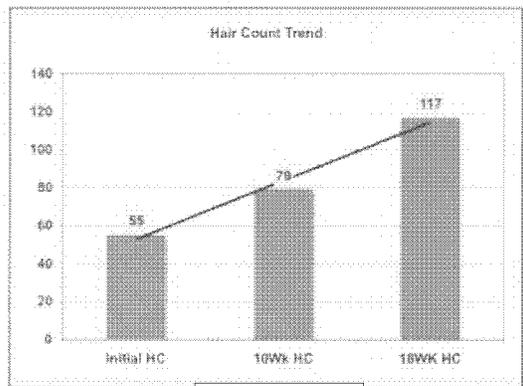
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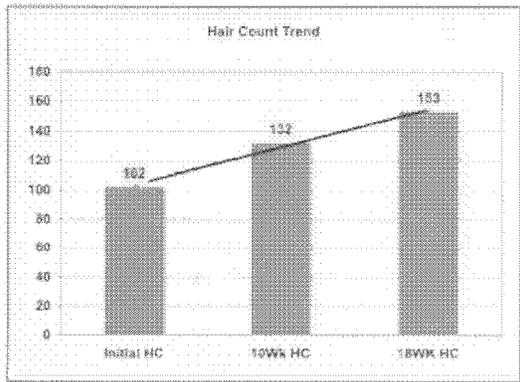
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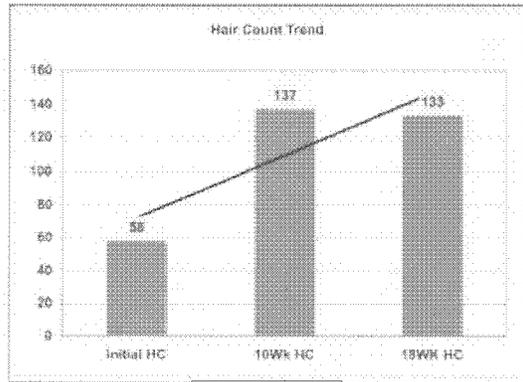
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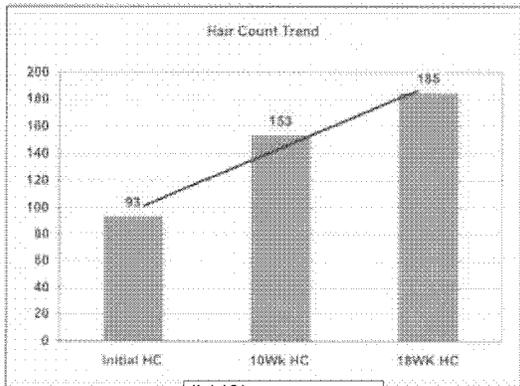
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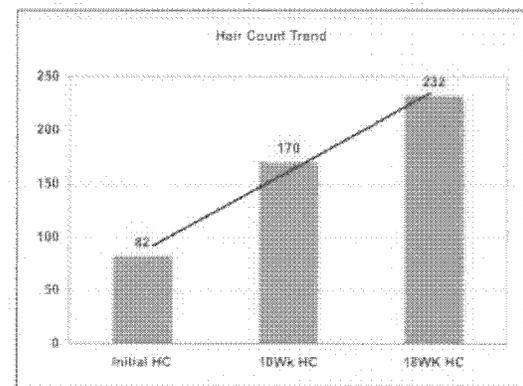
(b)(6)



(b)(6)



(b)(6)



(b)(6)

Page 7; ¶1 Issue:

Comment 3: The results do not clearly define how the primary endpoints of hair count and rate of hair growth were defined/calculated.

Response: I am somewhat confused as you stated concerning our hair count methods provided; "The information provided adequately addresses the statistical reviewer's concerns on this point."

However, on page 11, #7 you stated; "Please provide clarification on your Hair Count Method." I will provide additional specificity on our entire hair count procedures which is located in Page 11; ¶4 Issues.

Page 7; ¶5 Issue:

Comment 4: The primary investigator's CV and website suggest that he has three clinical sites: one in Pennsylvania and two in North Carolina; it is unclear whether subjects were enrolled at only one of these sites or at all three. This could impact how generalizable the results of this study are to the broader target population.

Response: As we discussed in the teleconference, all treatments were conducted at the clinical site located in High Point, NC. The subject population was from an area of not more than a 50-mile radius from the clinic.

Page 8; ¶1 Issue:

For example, subjects treated at a single site are likely to be more homogeneous than the broader population in terms of variables such as: race, ethnicity, income, skin type, etc. To the extent that any of these variables is associated with responsiveness to the device or compliance with the treatment regimen, these issues are highly relevant.

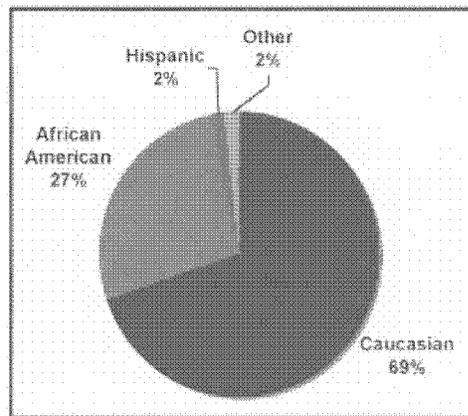
Response: Androgenic (androgenetic) alopecia in females, like males, is a genetic disorder. It is a disorder that affects approximately 27 million women throughout the United States. The *experimental* study was executed using the MEP-90 Hair Growth Stimulation System to treat females between 18-60 years of age who had been diagnosed with androgenic (androgenetic) alopecia and had both a Ludwig and Savin Female Hair Loss Scale classifications of I to II and a Fitzpatrick Skin Types I to IV (population).

There are several "non applicable to treatment response" variables due to ethnicity, but they do not apply to this Study or the MEP-90's medical usage. The Fitzpatrick Skin Typing is a variable related to laser safety and our compliance with 21CFR §1010. Admittedly, the population breakdown by skin type may vary by geographical location, but skin typing is a safety parameter versus a medical one and is not a factor of the disorder, nor impacts its severity and symptoms. Regardless, we tracked the study population by Fitzpatrick Skin Typing.

To insure integrity, we did not arbitrarily exclude any subject who met the skin type criteria as did predicate device K060305. As an indicator of our accuracy exceeding their study, I provide the following from their website:

Lexington limited the skin types for the laser hair growth treatment study to Fitzpatrick I to IV to facilitate the hair counting process. It is difficult to count dark hairs on dark skin and therefore the darker Fitzpatrick skin types (V and VI) were not included in the study.

Fitzpatrick Skin Typing is not an indicator of skin color. The color of the skin is only one of 10 factors that determine the Fitzpatrick Skin Typing classification. The darkest skin score of "4" would only represent 13% of the highest Fitzpatrick Skin Type classification ((IV= score of 26 to 30). Our ethnic breakdown of the subject population was as follows:



We based our qualification strictly on the actual Fitzpatrick score versus skin color.

In addition, I call your attention to the: The International Statistical Classification of Diseases and Related Health Problems 10th Revision Version for 2007 which does not classify androgenic alopecia as a geographical and/or sociological variable disease. See Page 8; ¶6 Issues

Page 8; ¶2 Issue:

Further, all subjects treated in this trial were done so under the aegis of a single clinical investigator. It is possible that this clinician is substantially more familiar with the device than other clinicians would be if the device were cleared for use. It is possible that the use of the device by such other clinicians may lead to variations in safety and / or effectiveness, perhaps only in a learning curve of the first few subjects, perhaps of longer duration. By conducting the trial at only one site, with one clinical investigator, these possibilities can not be adequately evaluated.

Response:

- My staff has engineering, design, product management, clinical research, clinical application/instruction and FDA regulatory compliance experience in pulse-oximetry, patient monitoring, computerized tomography, magnetic resonance imaging, x-ray (portable to catheterization), nuclear medicine, diagnostic ultrasound, radiation therapy, radiation therapy simulation, and medical lasers.

- The clinical effectiveness of all medical devices is dependent upon its proper usage which are factors of design, product support, and in the case of the MEP-90, compliance with 21CFR §1010. The only variation would be the degree of accuracy of the diagnosis, which is never the responsibility of any manufacturer unless it is a diagnostic device.
- This statement also suggests you are searching for a subjective rationale to disapprove the 5150(k) application for the MEP-90. I say that because we provided a copy of the current version of our MEP-90 Operation Manual which attests to the system's ease of use, yet no comments, criticisms, and/or change recommendations of the Manual have been presented.
- Dr. Koher, and the research staff had never seen or used the MEP-90s prior to the Study.
- Dr. Koher, and the research staff were all trained on the operation of the MEP-90 before using it on any subject (3 hours).
- The MEP-90 is in full compliance with 21CFR Part 1010 with regards to performance and safety requirements for the lasers employed.

However, the Study confirmed to us the following few, of many, items pertaining to your comment that go beyond compliance. For example:

- 1) The MEP-90 systems will be installed by a certified installer.
- 2) Formal user operation training will be made available (either on-site or at factory)
- 3) Due to the high potential for misdiagnosis of androgenic (androgenetic) alopecia in women, the MEP-90 is labeled as a device that can only be used under the direction of a licensed physician. This is why we specifically noted the MEP-90 was a "Prescription Use" only device.
- 4) We will have to make our disclaimers and guidelines stronger about only using it for the specified "Indications For Use." Almost all states allow the practice of "evidence-based individual decision" (EBID) medicine. As you know this represents is medicine as practiced by the individual health care provider. We believe this is what you currently have in the laser hair-growth marketplace. Some believe it works and some don't. However, few if any can back up their decisions on why they use it or not.
- 5) Androgenic (androgenetic) alopecia in women is a genetic disorder. CDRH regulates "radiation emitting devices" like those Class IIIa (Class IIIr) lasers in the MEP-90 which generate an energy related reaction on tissue and cells within the human body, which is undoubtedly why they are regulated by CDRH. This makes all these devices actual medical devices and not cosmetic improvement devices.

Page 8; ¶2 Issue:

This issue is reflected in both the E9 guideline "the subjects in the trial should ... mirror the target population" (Section II B (2.2.1)) as well as the CDRH statistical guidance: "the study population should be a representative subset of the population targeted for the application of the medical device.

Response: A 510(k) is the establishment of substantial equivalence (SE) and not a clinical trial as specified by conducting a PMA. The study population of MEP-90-CDA not only mirrors the one used in K060305, it establishes a higher degree of safety and effectiveness than the predicate without raising any new questions concerning either.

Page 8; ¶3 Issue:

Indeed, the E9 guideline states that one of the two main reasons for multicenter trials is to "provide a better basis for the subsequent generalization of its findings. This arises from the possibility of recruiting subjects from a wider population and of administering the medication in a broader range of clinical settings, thus presenting an experimental situation that is more typical of future use."

Response: There is no clinical and/or historical evidence that indicates the above applies to androgenic alopecia. The actual diagnoses of the disorder has no geographical or financial variables and is not a medication. The disorder is symptom specific and does not vary by location. Again, The International Statistical Classification of Diseases and Related Health Problems 10th Revision Version for 2007 which does not classify androgenic alopecia as a geographical variance disease.
See Page 8; ¶6 Issues

Page 8; ¶6 Issues:

3. Indications for Use—Need for Clinical Data

Your proposed indication for use, "Adjunctive use for the treatment of androgenic alopecia in females; the MEP-90 is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV," is not the same as predicate K060305's indications for use. Your claim for the treatment of females with androgenetic alopecia is not the same as predicate K060305's claim for treatment of males. In addition, your device has an indication for "reduce rate of hair loss in females," where as K060305 does not have a reduce hair loss claim in their indications for use.

Response: Medicine has a long and well-documented history of physical and genetic disorders that manifest themselves differently between the sexes, yet are classified as the same affliction. This applies for the treatment of androgenic alopecia.

The ICD is the international standard diagnostic classification for all general epidemiological, many health management purposes and clinical use. These include the analysis of

the general health situation of population groups and monitoring of the incidence and prevalence of diseases and other health problems in relation to other variables such as the characteristics and circumstances of the individuals affected, reimbursement, resource allocation, quality and guidelines.

It is used to classify diseases and other health problems recorded on many types of health and vital records including death certificates and health records. In addition to enabling the storage and retrieval of diagnostic information for clinical, epidemiological and quality purposes, these records also provide the basis for the compilation of national mortality and morbidity statistics by WHO Member States.

The International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Version for 2007 classifies androgenic alopecia as a "disease of the skin and subcutaneous tissue" and can be found in Chapter XII (L00-L99). The ICD-10 designations are L64 thru L64.9.

This would confirm that any legitimate treatment of this disease must be done by a classified medical device and by a licensed physician.

The differences between the Indications For Use for the MEP-90 and K060305 have absolutely no bearing on the disease or its treatment. Thus, a new device with the same intended use as a predicate device may have different specific indication statements, and, as long as these label indications do not introduce questions about safety or effectiveness different from those that were posed by the predicate device's intended use, the new device may be found SE.

Indication/Difference	MEP-90	K060305
Causes of androgenic alopecia as a chronic and/or genetic disease	Identical to K060305	Identical to the MEP-90
Use of the adjective "adjunctive"	The variations of the level of affliction mandate physicians' option of which treatment to use based on Evidence Based Medicine	Incorrectly suggests the device is the panacea for reintroducing hair growth
Initial location of hair loss	Circular and/or linear effect at the crown	M shaped and receding hairline at forehead
Visual Classification Chart used to determine the degree of hair loss	The Ludwig and the Savin charts which are for females only	Norwood-Hamilton chart which is for males only
Fitzpatrick Skin Typing Classification	Exceeds usage mandates as published by manufacturer of K060305	Same chart as by MEP-90 but manufacturer indicated it was biased. (see Page 8; ¶1 Issue)
Reduction of Hair Loss	Confirmation of new hair growth, visual size reduction in reviewed crowns, 100% of uncompensated (unbiased) patient written agreement to reduction and/or stoppage after six months.	Due to the known physiology of human hair growth cycle, the stimulation of hair growth would have to result in the reduction of hair loss. Manufacturer did not take study data far enough to justify indication.

Page 8; ¶7 Continued Thru Page 9; ¶1 Issues:

Your device is also different in treatment method in that it is a bonnet type device simultaneously treating the entire scalp, whereas K060305 is a comb treating individual areas one at a time as the device is passed through the hair in a combing fashion. Thus, differences in indications for use and treatment regime support the need for clinical data.

Response: We have no issue with providing the FDA with the necessary data to validate the design differences raise no new questions on safety and effectiveness. However, through all correspondence you have yet to provide any questions concerning a specific criterion being met concerning a specific issue of "safety and/or effectiveness."

As with many chronic diseases of the human body, the treatments given are palliative. Whether it is a life threatening disease like coronary artery disease or a non life threatening one like androgenic alopecia, there is no "cure." In addition, the degree of success (reduction of symptoms) with all palliative treatment protocols will vary from patient to patient due to many factors.

Again, I cite the rationale for evidenced based medicine (EBM), and the current state of this technology mandates the critical need for EBM. Again, the FDA states:

...Thus, as a matter of practice, CDRH generally considers a device to be SE to a predicate device if, in comparison to the predicate device:

- the new device has the same intended use; and,
- the new device has the same technological characteristics, (i.e., same materials, design, energy source, etc.); or, it has new technological characteristics that could not affect safety or effectiveness; or
- it has new technological characteristics that could affect safety or effectiveness, and
- there are accepted scientific methods for evaluating whether safety or effectiveness has been adversely affected as a result of the use of new technological characteristics; and
- there are data to demonstrate that the new technological features have not diminished safety or effectiveness.

Our compliance with 21CFR §1010 is the validation standard for safety since the device is a Class IIIa (Class IIIr) laser system. However, as I provided an example in my first response, there are variations of that system being sold, delivered, and treating patients in the United States (approximately 8,000-10,000) by non-medical personnel and these systems are not in compliance with 21CFR §1010.

This brings us to the "evaluation of effectiveness." Your initial determination of our study design was only from a statistical aspect of determination based on our not executing a placebo study. In other words, your determination criterion was based strictly on the fact that is what K060305 executed versus making a determination of MEP-90 effectiveness based on EBM.

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(b)(4)



Page 9; ¶2 Issue:

Regarding your reduce rate of hair loss in females claim, this indication for use must be removed or if you decide to pursue this claim, you must provide clinical data. This clinical study would require a lead in period to first determine what is an individual's normal rate of loss before treatment in order to show an effect on the rate of loss.

Response: This Indication For Use was one of the four basic hypotheses to be confirmed by the Study. However, the characteristics of the disease make it impossible to determine what the rate of hair loss in either men or women at anytime or in any manner except historical. That is because the blood levels of testosterone and the corresponding amount of the anagen dihydrotestosterone (DHT) can change on a daily basis in both men and women.

We have no issue with providing the clinical data, but your determination that our clinical study; "would require a lead in period to first determine what is an individual normal rate of hair loss before treatment in order to show an effect on the rate of hair loss," is an incorrect, prejudicial, subjective, and an erroneous demand that has no basis in medical fact or relativity to the disease of androgenic alopecia.

The progression of this disease has been established with the Ludwig Scale and the Savin Scale which are medically accepted principles. For the disease of androgenic alopecia, these two scales represent progression indicators without treatment for this chronic disease. That is to say that a female who today is a Type I on the Ludwig Scale will eventually progress to a Type IV or a Type V.

This medical progression description is no different than say one for coronary artery disease (CAD). While the progression of what will occur with an individual with CAD is known, the rate of progression will vary by subject and from subject to subject.

Regardless, we stated this Indication For Use based on the following nine (9) types of evidentiary data:

- 1) As provided on pages 18 and 19, at the end of the 18-weeks of treatments, the hair counts of all but two subjects exceeded 20%. The two subjects who did not exceed a 20% increase (b)(6) demonstrated an increase of 14% and 15% respectively. Therefore, at the 18-week level 100% of the subjects demonstrated no increase in measurable hair loss.
- 2) As provided on pages 19 thru 26, 100% of all subjects demonstrated an upward historical linear growth trend of hair count.
- 3) At the 18-week level, just prior to the 20th treatment, all subjects, who were unpaid volunteers, were provided the following questionnaire, and I call your attention to the results for Question #3:

(b)(4)

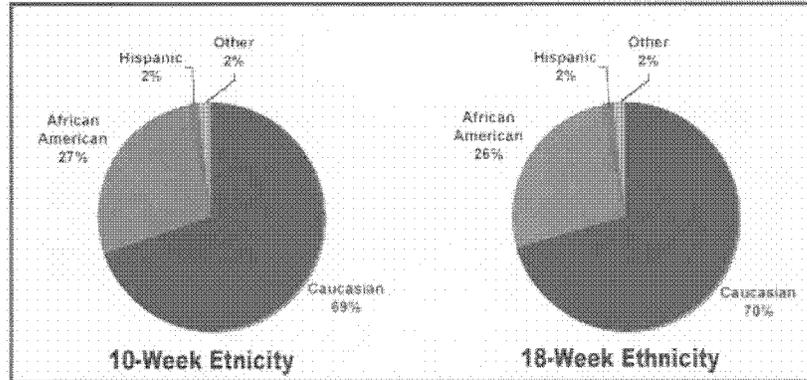
Questionnaire Item	Number	Percentage
<i>Question #3: Since starting the treatments, do you feel the area on your scalp with the visible hair loss is:</i>		
<i>Larger</i>	0	0%
<i>Smaller</i>	39	65%
<i>About The Same</i>	21	35%
Totals	60	100%

Although one subject felt their rate of hair loss had increased, 100% of all subjects indicated their hair loss had either reversed itself (smaller) or ceased (about the same).

4) The Phase 2 Hypothesis of "more than 50% of the subjects will demonstrate an increased hair count of $\geq 20\%$ at the 18-week level was confirmed. This confirmation is based on the evidence:

- 97% of the subjects demonstrated an increased hair count of $\geq 20\%$
- 3% of the subjects demonstrated an increased hair count from 0% to 19%
- 0% of the subjects demonstrated additional hair loss

- 5) There was no significant change ($\pm 2\%$) to the ethnicity distribution from Phase I.



- 6) All subjects who completed the 18-Week level were analyzed and scored according to the following:

(b)(4)

(b)(4)

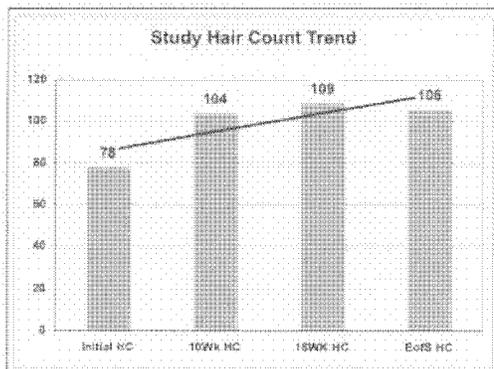
7) A total of 55 subjects completed the Phase 3; 26-Week level of treatments (52). All 55 women demonstrated no increase in hair loss:

Phase 3 Subject Hair Count Distributions	Number	Percentage
Hair growth between $\leq 1\%$ to 19%	3	5%
Hair growth between 20% to 30%	4	7%
Hair growth between 31% to 40%	2	4%
Hair growth between 41% to 50%	6	11%
Hair growth $\geq 51\%$	40	73%
Total	55	100%

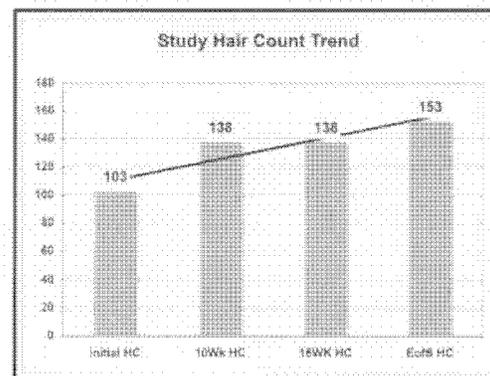
8) The three subjects who had to be excluded for excessively missed treatments, the one who developed a work conflict (transfer); and the one who decided to become pregnant had 10-week and 18-week hair counts as follows:

Subject ID#	10-Week HC & %	18-Week HC & %
(b)(6)	+26 (24%)	+25 (23%)
	+20 (38%)	+25 (48%)
	+58 (56%)	+48 (47%)
	+17 (25%)	+26 (39%)
	+24 (44%)	+62 (113%)

9) All 55 subjects who completed the 26-Week level demonstrated a positive historical linear trend of hair growth. For example:



(b)(6)



(b)(6)

2018

Page 9; ¶3 Issue:

3. Clinical Protocol Package

Please provide the entire clinical protocol package which includes the statistical success hypothesis used in this clinical study.

Response: Please refer to Pages 51 thru 85.

Page 9; ¶4 thru Page 10; ¶2 Issues:

5. Indications for Use Clarification

The proposed indications for use suggest this device is intended as an adjuvant to treatment for androgenic alopecia. It is unclear if any of the subjects who participated in this trial received concurrent alternative treatments, and if there are any treatments which would make the use of this device contra-indicated. If subjects received concurrent therapy in addition to the MEP-90 system, then their observed response is confounded, and can not be fully separated from the effect of the concurrent alternative therapy.

Your response points out that concurrent alternative therapy was an exclusion criterion of the trial.

This issue is highly relevant to the trial, particularly given that the clinical data submitted arise from an un-blinded, non-randomized, single-arm trial. As such, had any subjects been using a concurrent alternative therapy in addition to the investigational treatment, it would have confounded the results and made the evaluation of any improvement impossible to attribute to the investigational device, the concurrent treatment, or a possible interaction between the two. This question arose due to the apparent discrepancy between the proposed indications for use (allowing concurrent alternative therapies) and the clinical data submitted in support of this proposed indication (which excluded subjects with concurrent alternative therapies). Ideally, the trial should enroll and treat subjects as closely as possible to the intended indications for use.

In the absence of any clinical data on subjects treated with concurrent therapy, it is extremely difficult for FDA to evaluate the appropriateness of this proposed indication for use. The only clinically valid interpretation possible would be that the device is safe and effective when used as a monotherapy. There is no data to support its use in addition to other treatments, which may alter the safety and / or effectiveness of the investigational device.

- Please address this issue, given that the study population (women not using concurrent therapy) appears to be different from the intended target population (women who may or may not be using concurrent therapy).

Response: This contradictory statement causes my staff and I great concern over the objectivity being employed during the review of our 510(k) application.

(b)(4)

We administered each and every treatment whereas K060305 "took the word" of their subjects that they used their device three times per week and it was never published what controls, if any, were instituted to insure it was K060305 that stimulated hair growth versus a combination of K060305 and another therapy, i.e., Rogaine, Propecia, etc.

Your statement creates a "Catch-22" situation that goes beyond the scope of the 510(k) process. We conducted a legitimate and IRB sanctioned clinical study to validate if the MEP-90 is as safe and effective as the predicate device K060305. If we did not control/prohibit the use of concurrent therapy, our Study results would have been biased because we did not control the known variables. It is the physician who decides what treatment, and/or what combination of treatments thereof to use, not the manufacturer of medical devices.

If we had allowed concurrent therapies, statistically our Study would have been invalid, the hypotheses not legitimately confirmed, and no "stand alone" effectiveness of the MEP-90 could be legitimately presented.

Page 10: ¶3 thru ¶5 Issues:

3. Clarification on Data Sets

The sponsor states that no subject experienced an adverse event related to the device (p 13). However, it is unclear if this includes all 82 subjects enrolled, or if it is limited only to the 63 in the final dataset. If a subject discontinued treatment subsequent to an adverse event not reported to the investigator as a reason for discontinuing participation, then limiting the adverse event profile to those subjects who did not drop out could lead to under-estimating the rate of adverse events.

You state that this information was available in the original submission, but failed to provide a page number reference. You then state that they feel this question "insinuates multiple criminal allegations of noncompliance."

This question regards the issue of analysis datasets. Virtually every clinical trial submitted for FDA review clearly delineates multiple analysis datasets. These typically consist of:

- A safety dataset, used for adverse event analysis and consisting of all subjects enrolled in the trial.
- A full analysis or intent to treat dataset, used for the primary effectiveness analysis and consisting of all subjects randomized to receive treatment.
- A per protocol dataset, used to replicate the primary effectiveness analysis and consisting of all subjects in the intent to treat dataset who meet pre-defined protocol adherence criteria.

Response: Whereas we have no contention of providing the FDA these specifics as requested, we do wonder what are the reasons for 21CFR and 45CFR's establishment and sanctioning of Institutional Review Boards if their processes have no relevance to the FDA.

Again, you make reference to the term "clinical trial" which is relevant to a PMA than a 510(k) SE effectiveness study.

First, we did not limit the reported adverse events/incidents to those who completed the Study. All subjects who dropped out after treatment #1 were contacted by a Research Coordinator or a Research Assistant as to their reasoning, and/or problem, for not making the scheduled treatment appointment and/or not continuing with the Study. Not one "after starting then excluded" subject reported an adverse event.

Second, there were a total of three items/incidents reported during the course of the Study:

- 1) (b)(4)
- 2)
- 3)

Third, the data for full analysis of all candidates is submitted and located on pages 5 thru 9 and pages 10 thru 15.

Page 10; ¶6 thru Page 11; ¶3 Issues:

The protocol submitted did not make any mention of which analysis dataset(s) were generated, nor how many subjects were in each. It is therefore not clear, for example, whether the 22 subjects who were initially enrolled but did not complete the trial were included in the safety analysis. The safety analysis essentially states that no adverse events were reported. Nevertheless, the denominator of how many subjects this statement covers is highly relevant. This question was not an "insinuation" that the sponsor had broken the law; it was a simple request for clarification on information that every other trial submitted to the Agency routinely provides in recognition of its importance in evaluating the data submitted. If this information was provided in the original submission, a page number reference to that effect would have sufficed. If not, a statement documenting which subjects the safety / adverse event data was based on would have been sufficient. The data provided states that 19 subjects were excluded from the trial after being enrolled, and another 3 removed between the first and final evaluations, but does not state whether these subjects were included in the safety analysis (a valid question, particularly as they were excluded from the effectiveness analysis.) It is unclear whether these subjects were ever treated or not.

As stated in the E9 guideline "the protocol should also specify procedures aimed at minimizing any anticipated irregularities in study conduct that might impair a satisfactory analysis, including various types of protocol violations, withdrawals, and missing values" (Section V, part B (5.2))

- Please clarify which subjects were assessed in the safety analysis; e.g., all screened subjects, all enrolled subjects, all subjects who were evaluated at the first assessment, all subjects who were evaluated at the second assessment, etc.

Response: All individuals who set foot on the clinical site were included in the safety analysis and the adverse reports/incidents system.

Prior to the filing with the IRB, both the Sponsor's and the Principal Investigator's liability carriers were contacted for verification of coverage during the course of the Study. North Carolina law requires physician ownership of any clinical practice. Since the Raleigh surgical site was located "inside another business," only the High Point clinic could be used. This was due to the fact that the physical location where treatments were to be administered was not under the direct control of the Principal Investigator.

As part of the IRB filing and the protocol, exclusionary criterion was provided in the following categories:

- (b)(4)
-
-
-
-
-
-
-
-

Page 11; ¶4 Issue:

7. Clarification on Hair Count Method
From your explanation of your hair count method beginning on page 25 of your response to our AI Letter Dated July 22, 2009, it appears that the head was divided into quarters with multiple photographs being taken of each quarter. But on page 26, there is also a discussion of placing a grid on the count photo and then placing a 20 pixel colored dot on those hairs that could be traced to a root. It is unclear what is meant by the phrase "count photo," since it appears all photos were being counted. In addition, this method seems to add a second set of divisions within the photo by now dividing the count photo into quadrants. Thus, depending on how this process is interpreted it seems that for each individual, up to 20 quadrants were counted, that is 5 photos and each photo divided into 4 quadrants. If this assumption is correct, what method was used to insure that baseline and follow-up photographs were identical in terms of scalp area viewed within each photograph. Please provide clarification on your Hair Count Method.

Response: Through the course of the Study, a total of four (4) microscopic photographs were taken and used for hair counting. These .95cm x .75cm images were taken at the following times:

- 1) Just prior to treatment #1
- 2) As part of treatment #20 (10-Weeks)
- 3) As part of treatment #36 (18-Weeks)
- 4) As part of treatment #62 (26-Weeks)

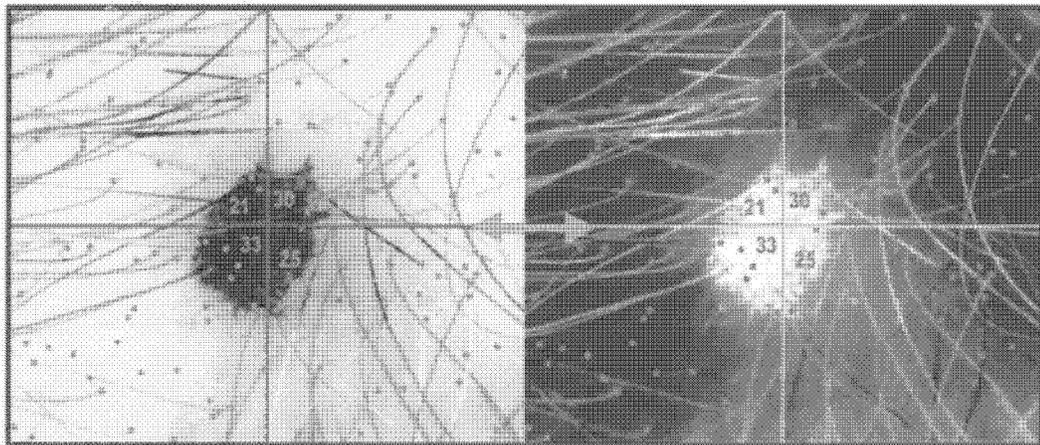
As a member of my staff reiterated during the teleconference, we believe there is no other way of legitimately determining the actual hair count except by physical counting.

As part of my August 19th submission, I presented a hair count photo taken and processed with the following explanation:

The microscopic imaging generated a raw image in "jpg" format. The raw image size generated was 17.778" wide by 14.222" tall with a dpi of 72. Using Adobe Photoshop v8.0, the microscopic photo sizes were changed to 6" wide by 4.81" tall with a dpi of 266. All raw images are archived in their original format with the processed images being archived using the "Save As" command.

Note: *If you are familiar with Photoshop usage, the photo itself does not change with the steps taken above since only the width and dpi were changed and the height is done automatically to maintain proportion.*

No image software adjustments were made, the only processing capability used was to invert the image if the hair coloring required it for viewing the individual hairs.

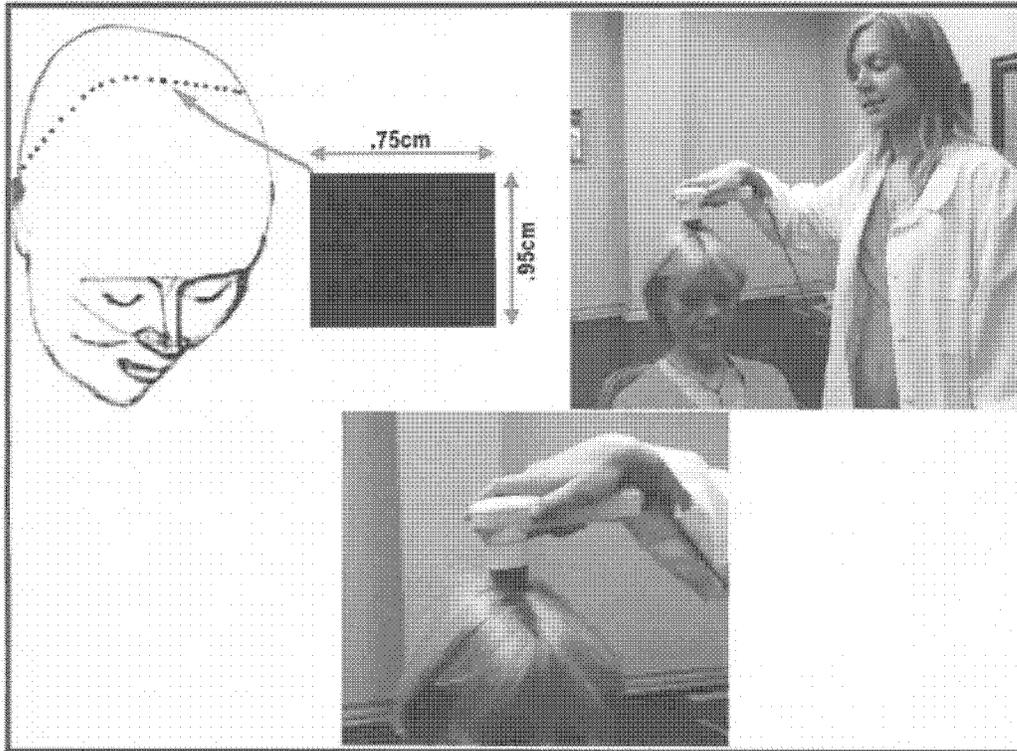


Note: *The above is two images are exact duplicates, i.e., same one hair count photo placed side-by-side. The reference to the quadrant only meant it was a "counting aid." If you add the four numbers, you get a total hair count of 109 for this one image. In this case, the photo was that of (b)(6) taken at the end of 18 weeks.*

Again, from my August 19th submission:

The method devised of marking the areas to be measured is as follows: sitting upright in a chair, head neutral position, eyes forward, a line drawn from the topmost portion of the pinna (ear) vertically over the scalp to the topmost portion of the opposite pinna (ear), intersected with a line drawn in the midline of the scalp, oriented from the glabella to the nuchal ridge. An indelible dot was placed at this intersection with a sharp tip permanent marking pen, which the subjects agreed to in their Informed Consent Form.

TSB

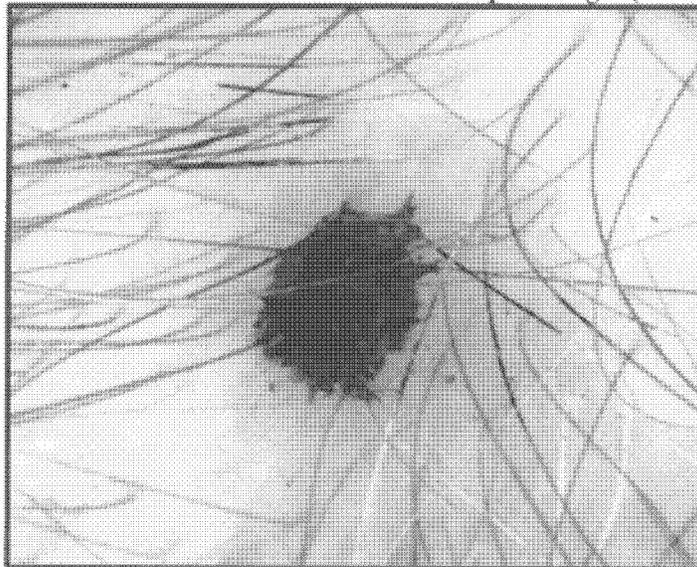


Note: All photos were taken on the subject's left side with the camera handle centered on the subject's left ear with the reference dot in the middle of the frame.

The indelible dot was checked prior to each treatment and if fading was applied over again on the fading dot. This was also used as an indicator if subject was using improper shampoos and/or conditioners.

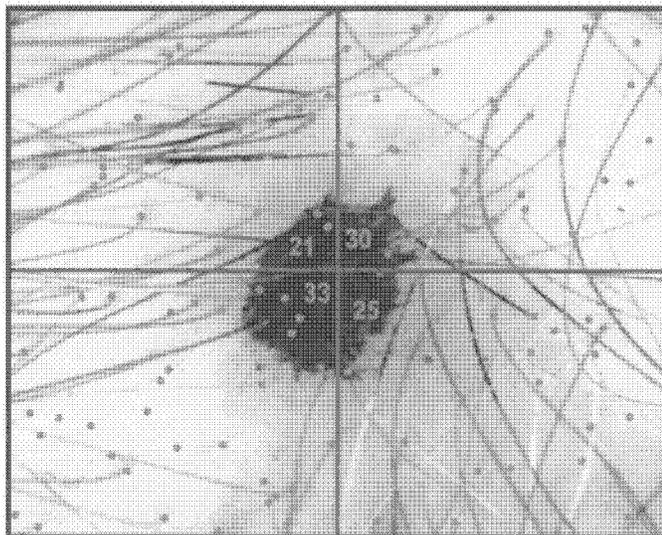
**Hair Count Procedures
(For All Initial, 10-Week, 18-Week, and 26-Week Photos)**

1-Raw 18 Week Hair Count Microscopic Image (.95cm x .75cm)

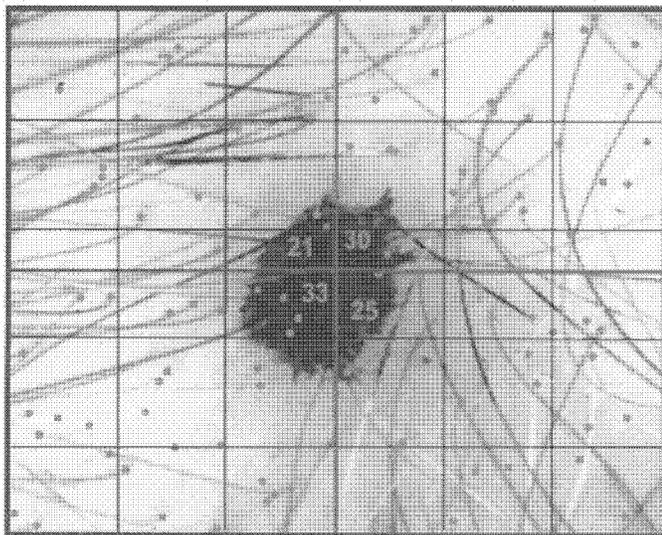


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2-Processed 18 Week Hair Count Microscopic Image



3-Processed 18 Week Hair Count Microscopic Image With Non-Printable Grid Used For Accuracy in the Physical Counting of the hairs.



Note: All three images are the same.

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Revised MEP-90 System Comparisons To Predicate Devices

The MEP-90 Hair Growth Stimulation System is as safe and effective as a combination of over 20 predicate devices that are cleared for commercial distribution in the United States, under the provisions of Title 21 U.S.C.; §510(k).

It has the same intended use for treatment of the same genetic disorder as the predicate device cleared under 510(k) Number K060305. The only difference is that the MEP-90 is intended for use on females only versus K060305's use on males.

Whereas androgenic (androgenetic) alopecia is medically as the same chronic genetic disorder in both males and females, there are differences in their demonstrated symptomology between the two sexes. To insure at least equal, if not superior effectiveness as predicate device K060305, an "experimental" type of clinical effectiveness study was performed under the guidance and oversight of an Institutional Review Board (IRB) and under the direct supervision of the IRB approved licensed physician (Principal Investigator).

The MEP-90 utilizes the same visible laser wavelength (λ) as previously approved devices and has a lower measured power output than the two predicate devices provided for reference data comparison. The MEP-90 is in full compliance with design, functions, safety, and usage with 21CFR Part 1010 (Performance Standards For Radiation Emitting Devices).

The safety and effectiveness of the visible lasers' wavelength (λ) do not raise any new safety and effectiveness issues as it is classified as a "non-significant risk" (NSR) device, and satisfies and/or exceeds FDA's substantial equivalence with respect to both the intended use and technological characteristics.

Revised Specific Comparisons To Predicate Devices Chart

Predicate Device Comparative Item 510(k) Number	Midwest RF MEP-90 K091496	Predicate HairMax K060305	Predicate Quantum K032810
Device Name	MEP-90 Hair Growth Stimulation System	HairMax Lasercomb	Quantum Light Therapy System w/QS2 & QS4
Manufacturer	Midwest R.F. LLC. 1050 Walnut Ridge Dr Hartland, WI 53029	Lexington Int'l LLC 777 Yamato Rd-S105 Boca Raton, FL 33431	Stargate Int'l, Inc. 10235 Progress Way Parker, CO 80134
Establishment Registration Number	2134565	3006182775	3004160935
Device Regulation Description	Infrared Lamp	Infrared Lamp	Infrared Lamp

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Predicate Device Comparative Item	MEP-90 K091496	HairMax K060305	Quantum K032816
Device Regulation Number	21CFR; §890.5500	21CFR; §890.5500	21CFR; §890.5500
Device Regulation Identification & Classification	A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating.	A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating.	A device that emits energy at infrared frequencies (approximately 700 nanometers to 50,000 nanometers to provide topical heating.
Physical State	Light Emitting Stimulator	Light Emitting Stimulator	Light Emitting Stimulator
Product Nomenclature	Lamp, Infrared	Lamp, Infrared	Lamp, Infrared
Product Code	OAP	OAP	NHN
Device Class	Class 2	Class 2	Class 2
21CFR Part 1010 Laser Classification/Compliance	IIIa, IIIr Full Compliance	IIIa Unknown Compliance	IIIa Full Compliance
FDA Device Risk Classification	Non-Significant (NSR)	Non-Significant (NSR)	Non-Significant (NSR)
Wavelength (λ)	650nm (+≤1%) 650nm to 650.78nm Measured	650nm (±5%) 617nm to 682nm Published	628nm to 635nm (±5%) 596nm to 667nm Published
Output Power Per Diode in mw/cm ²	≤4.5mw/cm ² Measured	≤5mw/cm ² Published	≤5mw/cm ² Published
Output Energy Per Diode in J/cm ²	.03213 J/cm ² Mathematically derived	.0357 J/cm ² Mathematically derived	.0357 J/cm ² Mathematically derived
Number of Lasers	82	1 which is mirror reflected	QS2=2; QS4=4
Laser Pulse Rate	Continuous	Unknown-Proprietary	Unknown-Proprietary
Laser Pulse Duration	Continuous	Unknown-Proprietary	Unknown-Proprietary
Power	3 Volts DC; 110vAC converted to 24v DC	Unknown-Proprietary	Unknown-Proprietary Published As 1.8 watts nominal (120 volts A.C., 60 Hz).
Aiming Beam	No lens; diffused Beam Fixed Coverage	Lens but proprietary User Directed	Lens but proprietary User Directed
Laser Beam Scattering	None - Fixed angulation and required beam interruption prevent beam scattering outside of Hood assembly	User Directed	User Directed
Output Mode	Direct Light	Mirror Reflected	Direct Light

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Predicate Device Comparative Item	MEP-90 K091496	HairMax K060305	Quantum K032816
Sterilization	Basic Cleaning Instructions Provided; No Sterilization Claimed, Called For Or Possible	No Sterilization Claimed, Called For In Published Materials	No Sterilization Claimed, Called For In Published Materials
Accessories	None; all items described are necessary for basic operation including mouse, keyboard, monitor, safety keys for key lock, 10' medical grade power cord, operation manual; 2 pair of laser safety glasses	Unknown besides storage case and cord	Unknown besides storage and carrying case and strap, safety keys for key lock, power cord for charging, operation manual
Materials	Injection molded and painted polycarbonate and polystyrene, Thermoformed and painted ABS, Molded and painted fiberglass. All paint is two part epoxy based	Unknown and would be proprietary information under 18U.S.C.,§1832- Assumed No Issues Due To Issuance of 510(k)	Unknown and would be proprietary information under 18U.S.C.,§1832- Assumed No Issues Due To Issuance of 510(k)
Biocompatibility	There are no materials in use on this device that are not in routine use on other devices. The biocompatibility is comparable to any of the legally marketed devices listed as follows: Midwest RF K003386 Model 1100GE-64 Midwest RF K051618 Model 1400GE-64	Assumed No Issues Due To Issuance of 510(k)	Assumed No Issues Due To Issuance of 510(k)
Indications Of Use	MEP-90 is for adjunctive use for the treatment of androgenic (androgenetic) alopecia in females and is indicated to promote hair growth and/or reduce the rate of hair loss of females with androgenetic (androgenetic) alopecia who have Ludwig and Savin Hair Loss Scale classifications of I to II and who have been determined to have a Fitzpatrick Skin Typing of I to IV.	The LaserComb is indicated to promote hair growth in males with androgenetic alopecia who have Norwood Hamilton Classifications of IIa to V and Fitzpatrick Skin Types I to IV.	Quantum is for adjunctive relief of minor muscle and joint issues such as; arthritis, muscle spasm, rheumatism, migraine headaches, lower back pain, repetitive strain injuries, tendonitis, fibromyalgia, sprains and strains, postoperative pain, tennis and golfer's elbow, shoulder and stiffness.

Predicate Device Comparative Item	MEP-90 K091496	HairMax K060305	Quantum K032816
<u>Indications Of Use Source</u>	Prescription	Over The Counter	Prescription
<u>Indications Of Use Sale and Usage Restrictions</u>	Direction of Licensed Physician Only	Open	Direction of Licensed Physician Only
<u>Indications Of Use Installation</u>	Certified On Site Installer	Drop Shipped To User	Drop Shipped To User
<u>Indications Of Use Operator and User Training/Education</u>	Factory and/or On Site Training (User option) of approximately 6-8 hours at installation; Internet access for operational updates on MEP-90; Operation Manual; Continuing education program TBD	Operation Manual	Operation Manual
<u>Indications Of Use Operation Control And Length of Treatment</u>	Default Settings for recommended treatment protocol; Operator resets of time and dosage which is controlled by computer	Operator Dependent	Operator Dependent
<u>Indications Of Use Safety In Operation</u>	Warning labels on device; key lock with on screen warning; default treatment settings; fixed maximum power output regardless of settings; constant thru beam interrupt by patient required for laser operation; warning on screen to insure operator and patient are wearing safety glasses before lasers will operate; no beam scatter outside hood assembly; tilting of head no $\geq 3/8$ " interrupt; head proximity safety circuitry	Warning label on device then 100% Operator dependent	Warning label on device; key lock, then 100% Operator dependent

Additional Comparisons To Predicate Devices

The MEP-90 Hair Growth Stimulation System has the same intended use and/or technological characteristics as the predicate devices listed and at least an additional 15 previously FDA 510(k) approved laser devices.

- 1- The MEP-90 System is substantially equivalent to predicate device K060305 for adjunctive use in providing treatment of androgenic (androgenetic) alopecia.

- 2- The MEP-90 System is substantially equivalent to predicate device K060305 for stimulating hair growth in patients diagnosed with androgenic (androgenetic) alopecia.
- 3- The MEP-90 System meets the clinical application criterion of predicate device K060305 in that it provides identical treatment coverage of the anatomical area called for by a current medically accepted protocol.
- 4- The MEP-90 System utilizes the same wavelength low-level laser as the predicate device K060305, i.e. 650nm ($\pm 5\%$). The acceptable range of the lasers used by the MEP-90 System is from 650nm to 650.8nm which exceeds the published tolerance of the predicate device K060305, which operates at 618nm to 683nm.
- 5- The MEP-90 System is capable of obtaining the identical clinical results as the predicate device K060305 due to its technology and design. The MEP-90 System utilizes the same laser technology as the predicate device K060305 and its clinical efficacy was confirmed based on IRB approved clinical trials performed in 2008-2009.
- 6- The current accepted protocol for treatment calls for the application of the device K060305 to be brushed through the entire scalp area in order to cover the afflicted area. This requires dependence on the patient to insure total coverage of the affected area. The MEP-90 System's total scalp area coverage design provides consistency of application and results. However, the anatomical area(s) treated are identical to the predicate device K060305.
- 7- The power output of the lasers in the MEP-90 System are identical to the predicate devices K060305 and K032816, and do not raise any safety or efficacy issues.
- 8- The different quantity of energy sources between the MEP-90 System (82) and the predicate devices; (K060305 - one) (K032816 - one, two, or four) does not raise any safety and/or efficacy issues with respect to power output regarding total surface area covered.
- 9- The different quantity of energy sources between the MEP-90 System (82) and the predicate devices; (K060305 - one) (K032816 - one, two, or four) does not raise any safety and/or efficacy issues with respect to power output regarding time.
- 10- The comparison of patient contact materials of construction for the MEP-90 System do not raise any biocompatibility issues when compared to K060305 and K032816 as no patient contact is required and the materials have been verified to be biocompatible.
- 11- The chronic genetic disorder of androgenic (androgenetic) alopecia, although considered the same between males and females, do present some differences in the symptomology between the two sexes. These differences do not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.

- 12- The clinical fact that the hair loss symptoms of men begin in an "M" shaped loss at the forehead versus the circular to linear beginning at the female crown does not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.
- 13- The comparison of males to the Norwood Hamilton hair loss scale chart versus the comparison of females to the Ludwig chart and the Savin chart does not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.
- 14- The Fitzpatrick skin typing classification is identical for both males and females therefore that does not raise any questions of safety and effectiveness, only the appropriate differences in wording between the Indications For Use between the MEP-90 and the Predicate Device K060305.
- 15- We used the term "adjunctive" due to the availability of other treatment options to the physician and to meet the criterion of evidenced based medicine (EBM)

The MEP-90 SYSTEM is substantially equivalent to the predicate devices as it has the same intended use; technological characteristics; energy delivered; materials, performance, safety, effectiveness, labeling, biocompatibility, and meets the same regulatory standards.

(b)(4)



(b)(4)



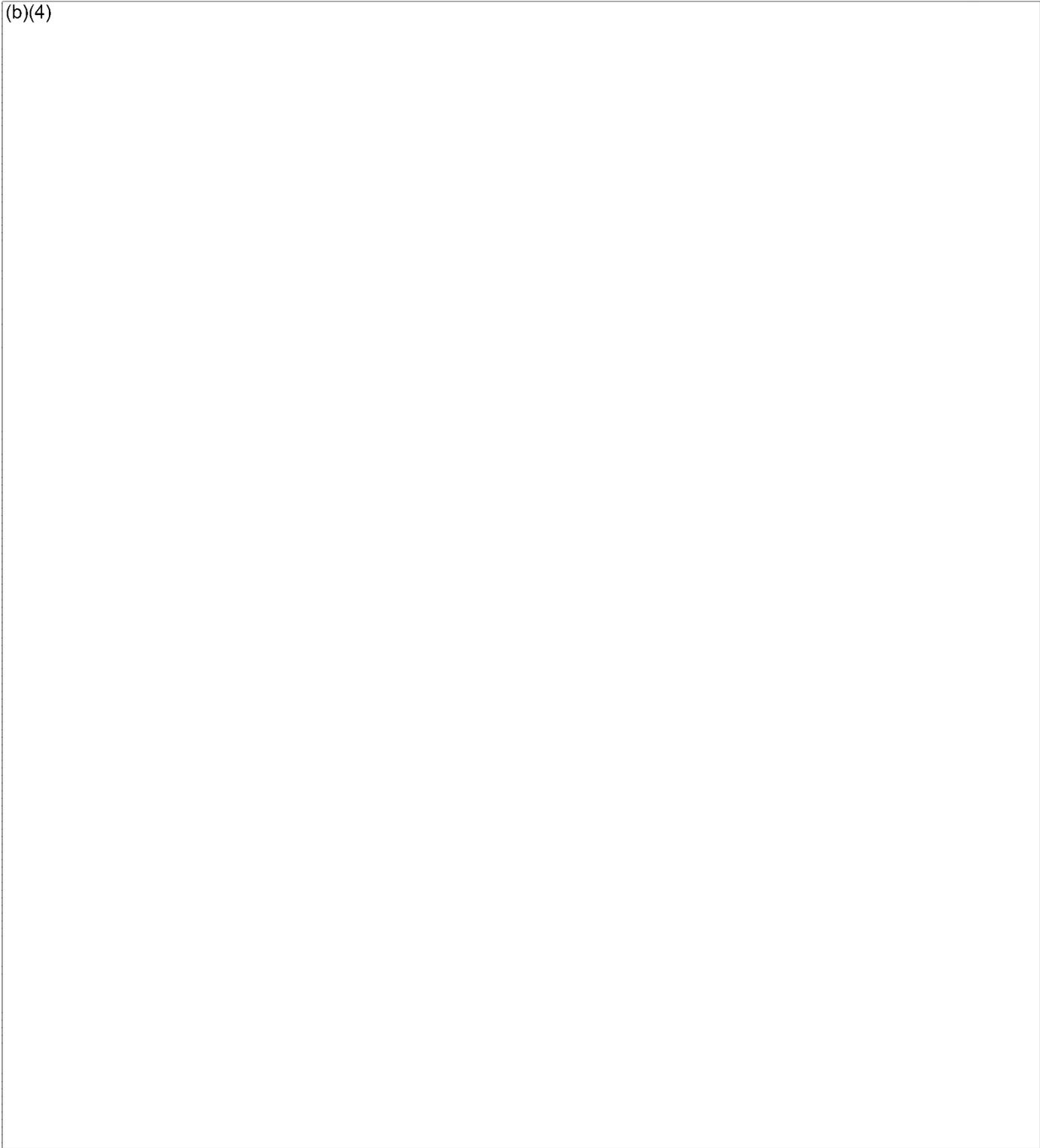
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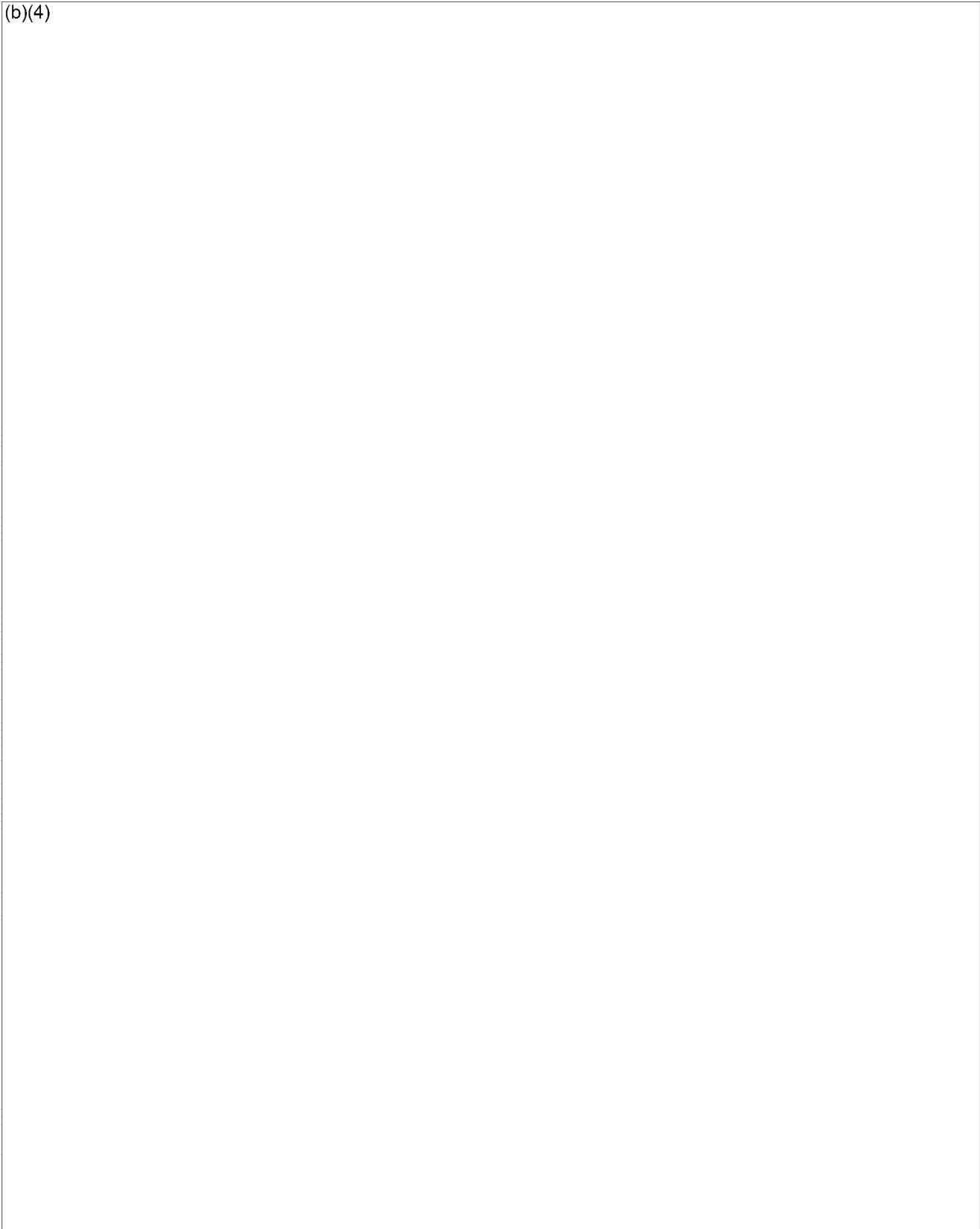
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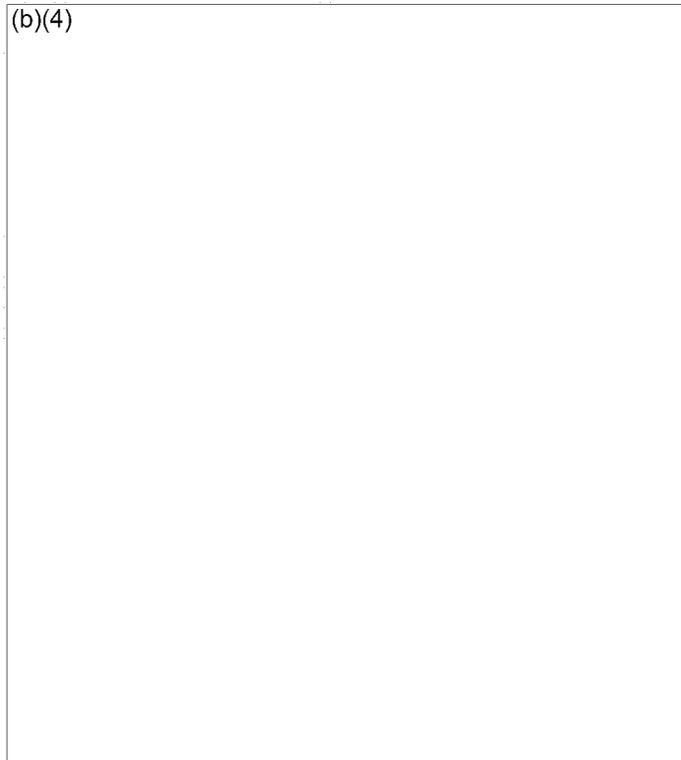


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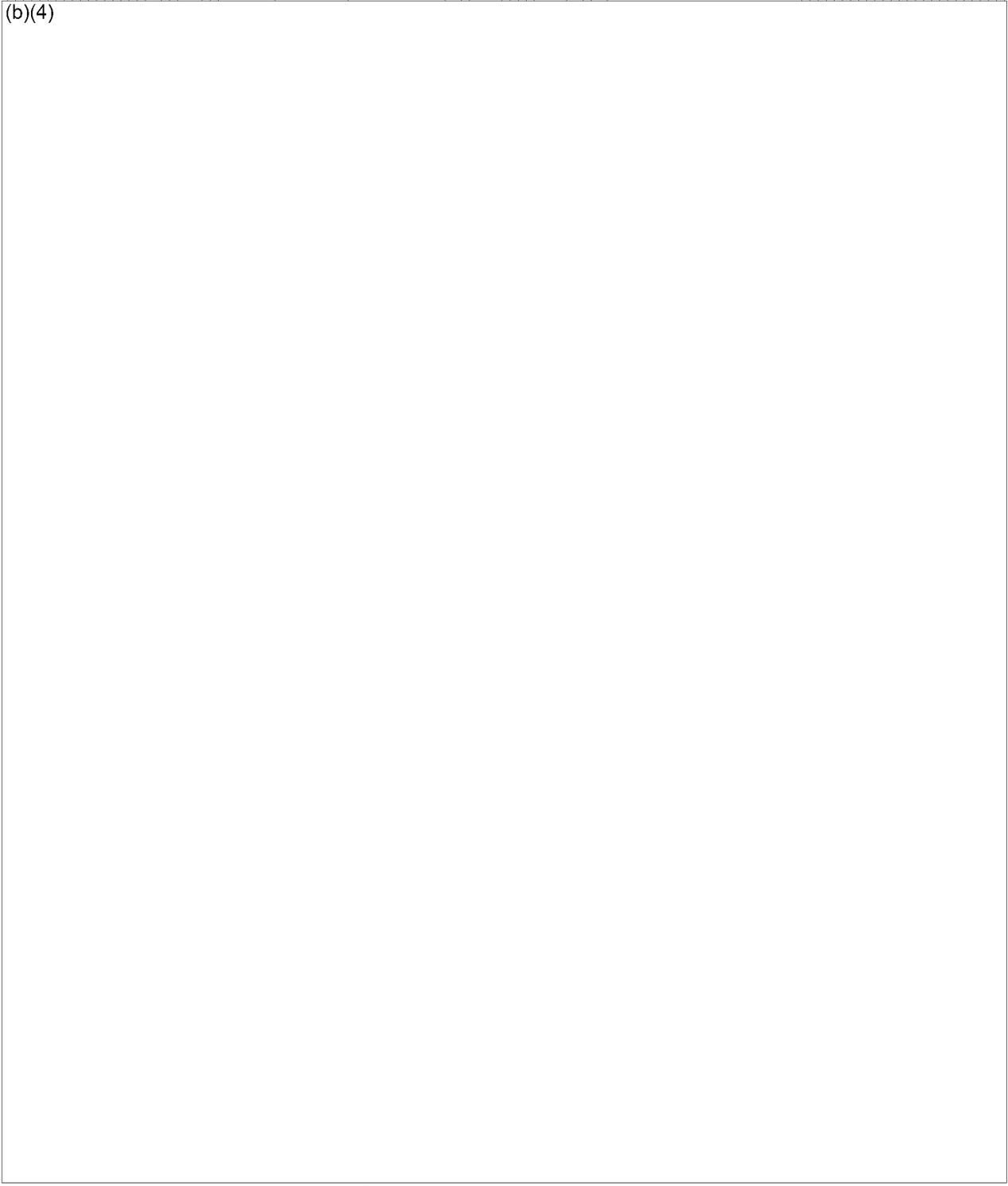
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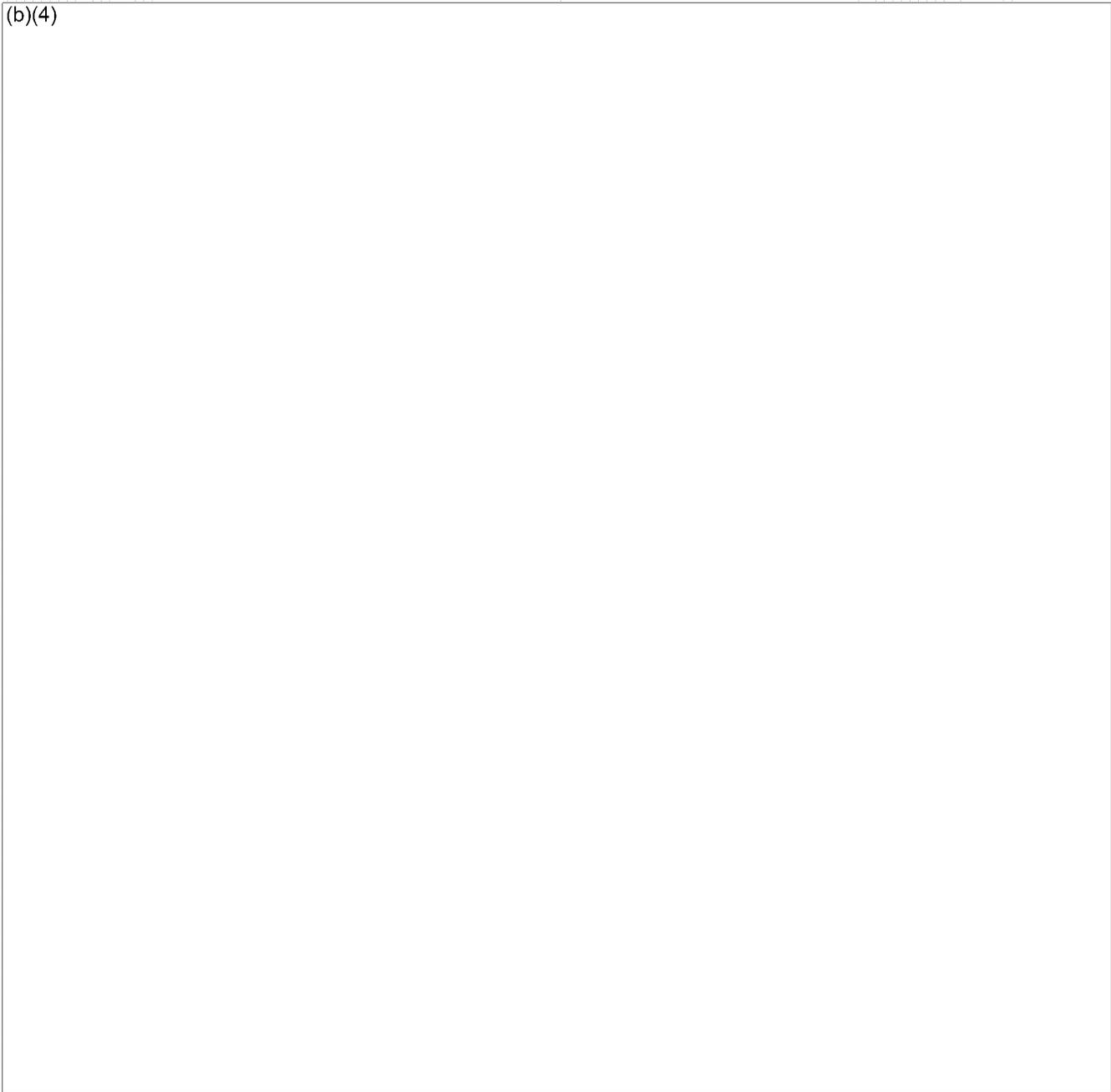
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All Fileds In Yellow Require Data

(b)(4)



∞ END OF STAGE I ∞

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∞ CONFIDENTIAL ∞

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CONFIDENTIAL

Blank Clinical Treatment Data Form

(b)(4)

A large, empty rectangular box with a thin black border, occupying most of the page. It is intended for clinical treatment data but is currently blank.



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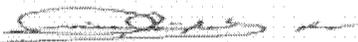


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(b)(4)



IRB Certificate of Approval

WIRB [®] (360) 252-2500 1-800-562-4789 FAX: (360) 252-2498	Western Institutional Review Board [®] Western International Review Board [®] 3335 SEVENTH AVENUE, SW, OLYMPIA, WA 98502-9010 P.O. BOX 13029, OLYMPIA, WA 98508-2029	<i>Certificate of Approval</i>
THE FOLLOWING WERE APPROVED:		
INVESTIGATOR: Grant F. Kohler D.O. 5520-203 McNeely Drive Raleigh, North Carolina 27612	BOARD ACTION DATE: 5/27/2008 PANEL: 5 STUDY APPROVAL EXPIRES: 5/27/2009 STUDY NUM: 1098575 WIRB PRO NUM: 20080612 INVEST NUM: 140351 WO NUM: 1-485401-1 CONTINUING REVIEW: Annually SITE STATUS REPORTING: Annually	
SPONSOR: Midwest RF, LLC PROTOCOL NUM: MEP-90A-CDA AMD. PRO. NUM: TITLE: MEP-90 Hair Growth Stimulation System Data Acquisition Study & Clinical Protocol MEP-90A-CDA		
APPROVAL INCLUDES: Investigator Administrative Letter (05-01-2008) Administrative Letter (05-25-2008) Protocol Consent Form [SU] Advertisement #5561151.0 Brochure Clinical Data Acquisition & Research Study - As Modified		
WIRB APPROVAL IS GRANTED SUBJECT TO: The Board determined that the device as used in this research study is a non-significant risk device. The Board requires that all subjects must be able to consent for themselves to be enrolled in this study.		
<p>IF YOU HAVE ANY QUESTIONS, CONTACT WIRB AT 1-800-562-4789 This is to certify that the information contained herein is true and correct as reflected in the records of the Western Institutional Review Board (WIRB). WE CERTIFY THAT WIRB IS IN FULL COMPLIANCE WITH GOOD CLINICAL PRACTICES AS DEFINED UNDER THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) REGULATIONS AND THE INTERNATIONAL CONFERENCE ON HARMONISATION (ICH) GUIDELINES.</p>		
 Theodore D. Schultz, J.D., Chairman		6/2/2008 (Date)
<small>This document electronically reviewed and approved by Orise, Otto on 6/2/2008 1:31:53 PM PST. For more information call Client Services at 1-360-252-2500</small>		



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IRB Certificate of Approval Extension

WIRB[®]

CLERK: 252-2500
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Western Institutional Review Board[®]

3535 SEVENTH AVENUE, SW, OLYMPIA, WA 98502-5010
P.O. BOX 12029, OLYMPIA, WA 98508-2029

*Certificate
of
Approval*

THE FOLLOWING WERE APPROVED:

INVESTIGATOR: Grant F. Kober D.O.
2203-103 Eastchester Drive
High Point, North Carolina 27265

BOARD ACTION DATE: 5/5/2009
PANEL: 5
STUDY APPROVAL EXPIRES: 5/27/2010
STUDY NUM: 1098575
WIRB PRO NUM: 20080612
INVEST NUM: 140351
WO NUM: J-548987-1
CONTINUING REVIEW: Annually
SITE STATUS REPORTING: Annually

SPONSOR: Midwest RE, LLC
PROTOCOL NUM: MEP-90A-CDA
AMD. PRO. NUM:
TITLE:
MEP-90 Hair Growth Stimulation System Data Acquisition Study & Clinical Protocol MEP-90A-CDA

APPROVAL INCLUDES:

Study and Investigator for an additional continuing review period. This approval expires on the date noted above.

WIRB APPROVAL IS GRANTED SUBJECT TO:

IF YOU HAVE ANY QUESTIONS, CONTACT WIRB AT 1-800-562-4789
This is to certify that the information contained herein is true and correct as reflected in the records of the Western Institutional Review Board (WIRB). WE CERTIFY THAT WIRB IS IN FULL COMPLIANCE WITH GOOD CLINICAL PRACTICES AS DEFINED UNDER THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) REGULATIONS AND THE INTERNATIONAL CONFERENCE ON HARMONISATION (ICH) GUIDELINES.



Robert D. Schultz as for
Theodore D. Schultz, J.D., Chairman

5/13/2009
(Date)

This document electronically reviewed and approved by Taylor, Robert on 5/13/2009 5:59:45 AM PST. For more information call Client Services at 1-360-252-2500

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Research Staff Training

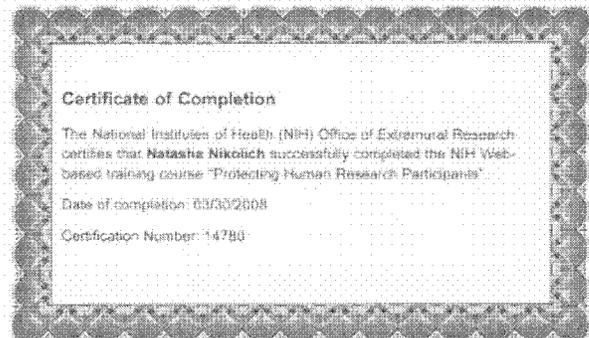
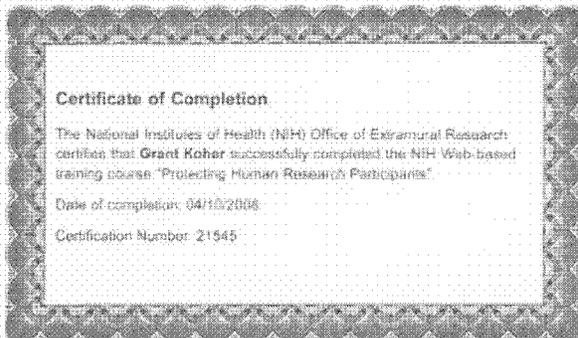
All members of the Research Team, including the Principal Investigator, were required to undergo training and be qualified in specific areas prior to their involvement of the Study.

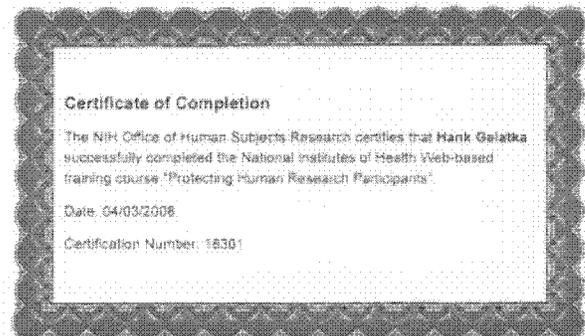
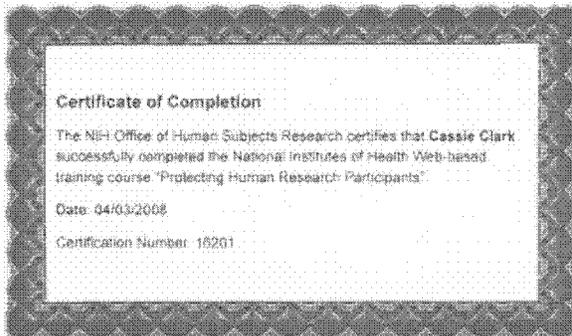
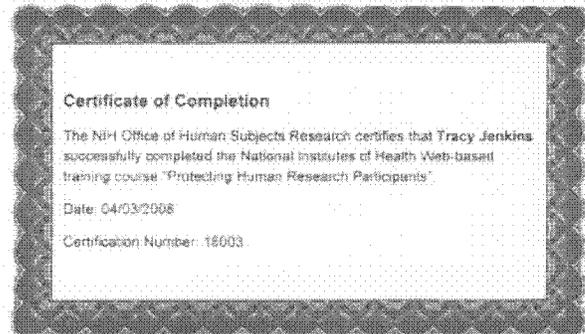
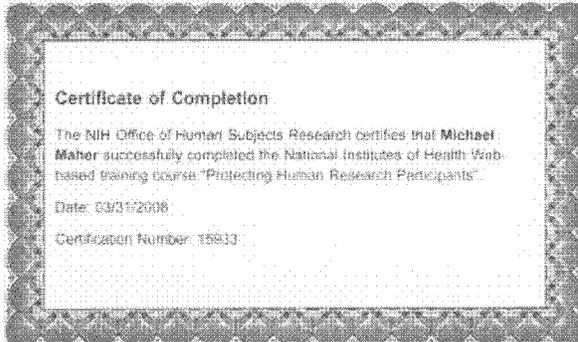
To being approved/qualified with the IRB, all staff members were required to successfully complete the following before participation:

- National Institutes of Health (NIH) Office of Extramural Research course, "Protecting Human Research Subjects."
- Provide their curriculum vitae (CV)

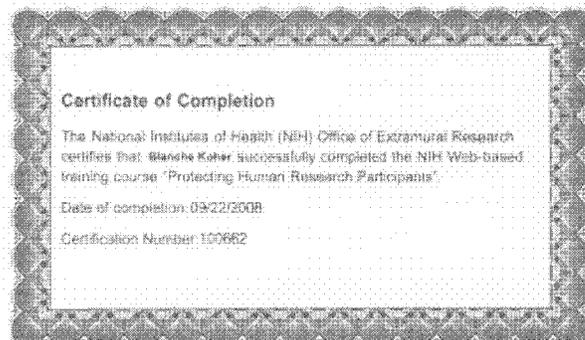
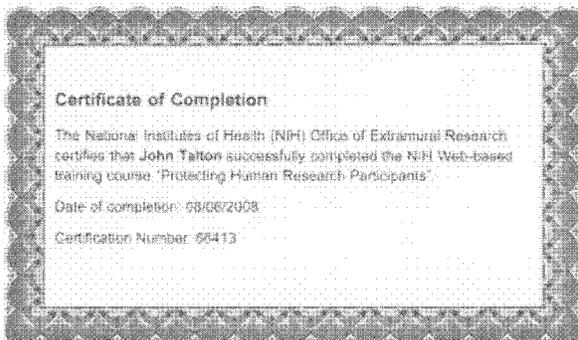
Upon receipt of IRB approval, all members of the Research Team, including the Principal Investigator, received formal training and were qualified in the following:

- MEP-90 System Operation
- Execution of Informed Consent Procedures
- Execution of Screening Procedures
- Application of Treatments With the MEP-90
- Photography and Documentation Procedures
- Hair Count Procedures (Principal Investigator and Research Coordinators only)





Research Staff Add-Ons:





U.S. Food and Drug Administration
Center for Devices and Radiological Health
Document Mail Center – WO66-G609
10903 New Hampshire Avenue
Silver Spring, MD 20993-0002

January 20, 2010

MIDWEST R.F. LLC.
1050 WALNUT RIDGE DRIVE
HARTLAND, WISCONSIN 53029
UNITED STATES
ATTN: HELMUT KEIDL

510k Number: K091496

Product: MEP-90 HAIR GROWTH

The additional information you have submitted has been received.

We will notify you when the processing of this submission has been completed or if any additional information is required. Please remember that all correspondence concerning your submission **MUST** be sent to the Document Mail Center at the above letterhead address. Correspondence sent to any address other than the one above will not be considered as part of your official premarket notification submission. Also, please note the new Blue Book Memorandum regarding Fax and E-mail Policy entitled, "Fax and E-Mail Communication with Industry about Premarket Files Under Review. Please refer to this guidance for information on current fax and e-mail practices at <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm089402.htm>. On August 12, 2005 CDRH issued the Guidance for Industry and FDA Staff: Format for Traditional and Abbreviated 510(k)s. This guidance can be found at <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm084365.htm>. Please refer to this guidance for assistance on how to format an original submission for a Traditional or Abbreviated 510(k).

The Safe Medical Devices Act of 1990, signed on November 28, states that you may not place this device into commercial distribution until you receive a letter from FDA allowing you to do so. As in the past, we intend to complete our review as quickly as possible. Generally we do so in 90 days. However, the complexity of a submission or a requirement for additional information may occasionally cause the review to extend beyond 90 days. Thus, if you have not received a written decision or been contacted within 90 days of our receipt date you may want to check with FDA to determine the status of your submission.

Please ensure that whether you submit a 510(k) Summary as per 21 CFR 807.92, or a 510(k) Statement as per 21 CFR 807.93, it meets the content and format regulatory requirements.

If you have procedural questions, please contact the Division of Small Manufacturers International and Consumer Assistance (DSMICA) at (301)796-7100 or at their toll-free number (800)638-2041, or contact the 510k staff at (301)796-5640.

Sincerely,

510(k) Staff

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1K091496/53
Midwest RF, LLC • 1050 Walnut Ridge Drive • Hartland, WI 53029
(262) 367-8254 • fax (262) 367-8544

January 15, 2010

Food and Drug Administration
Center For Devices and Radiological Health
Document Mail Center -WO66-G609
10903 New Hampshire Avenue
Silver Spring, MD 20993-0002

FDA CDRH DMC

JAN 20 2010

Received

ATTN: LTJG Atiq Chowdhury

Subject: Validation of Hair Count For 510(k) Submission K091496

Dear LTJG Chowdhury:

I am submitting the final results of our "recount" and/or "validation" of the reported Study results regarding the MEP-90 - Hair Growth Stimulation System. To insure total understanding, I am including more specific information regarding the methodology used:

- We contracted a total of four separate individuals for the validations/recounts. All had a minimum of a Bachelor's degree, with three having a Masters degree in Nursing.
- None of the "validators" had any type of professional/personal relationship or affiliation (previous, present, or future) to the manufacturer, the Study, and/or the Principal Investigator. None had a personal relationship to each other, except three worked at the same hospital in different departments, i.e. Emergency Room, ICU, Cardio/Pulmonary Rehabilitation, and Pacemaker Clinic.
- The "validators" were presented an overview of the Study methods, explanation of what constituted countable and not countable hairs. The images were equal parts Baseline (Initial Hair Count) photos (33), 10-Week photos (33), and 18-Week photos (33).
- The "validators" were not aware of at what point in the Study a specific photo was taken, who the Subject was, what the results of the original count of that photo was, nor what the count(s) were obtained by the other counters.
- The photos were sequentially numbered for control purposes; the numbering system start out with 3001(1) and progressed to 3099(99). However, as stated in my correspondence of October 30th, their position placements were not sequential within the counting publication.
- The chart on the following page represents the actual photo distribution for the recount:

K87

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Subject ID	Initial Photo	10-Week Photo	18-week Photo
(b)(6)	3015	3031	3061
	3058	3047	3072
	3001	3032	3038
	3048	3073	3084
	3016	3012	3062
	3046	3049	3017
	3039	3091	3069
	3071	3002	3063
	3040	3074	3013
	3078	3030	3050
	3008	3085	3092
	3070	3041	3003
	3024	3051	3093
	3079	3075	3014
	3052	3036	3094
	3083	3095	3037
	3004	3059	3064
	3053	3086	3060
	3018	3023	3005
	3034	3076	3098
	3080	3054	3035
	3006	3099	3025
	3029	3087	3097
	3090	3055	3026
	3019	3077	3065
	3042	3066	3033
	3007	3022	3088
	3081	3056	3027
	3043	3011	3068
	3020	3096	3082
3028	3057	3010	
3089	3044	3021	
3009	3067	3045	

- Each "validator" worked from a separate notebook containing 99 each 8 1/2" x 11" photo pages as submitted on October 30, 2009.
- Each validator also utilized a computer presentation of the same images and viewed them in Adobe Photoshop CS. They were given instructions on the program's magnification, grid placement for counting accuracy, and inverting of the image. To insure integrity and eliminate any bias, each validator was provided their own named file with the 99 images labeled differently and had no access to the other validators' photo files.
- For corporate reference, I also had a member of my staff also do a recount for comparison purposes, following the same exact protocol as the contracted validators.

Validation Results Of Initial (Baseline), 10-Week, and 18-Week Hair Counts

Overview

- 1) We have provided you with a spreadsheet presentation of these recounts containing the results from 33 randomly chosen Subjects executed by the validators.
- 2) Our Study and the symptomology of androgenic alopecia confirms the requirement for confirmation of the hypothesis by each individual subject versus by total population, based on the rationale previously submitted.
- 3) We consider the critical considerations for the data obtained to be reviewed with the following priorities:
 - **Baseline (Initial) hair Count** - Although our diagnostic accuracy of androgenic alopecia as the underlying cause of the affliction proved to exceed 99%, it is fully recognized that the first critical measurement is the "initial" or "baseline" count.

This hair count was executed just prior to the first administered treatment and serves as the key point of reference for all future counts as it defines the difference between the Start Point (0 treatments) and the 18-Week level (36 administered treatments).

Obviously, if there are major errors/miscounts at this measurement point, it will affect the true accuracy of the treatments' successes or failures. Therefore, we based our comparisons on five additional counts as they compared to the counts obtained in the Study.

- **10-Week Hair Count** - During our study research phase, we determined that at the 10-week period, the treatments should indicate some type of results. This rationale was based on the specifics of the technology, the disease, and human physiology.

These factors made us expect that the results could be any of the following:

- a) no change in hair count
- b) additional hair loss (lower count than the Initial)
- c) hair growth (higher count than the Initial)

However, we realized that there had to be tangible growth for the technology to be accepted by both the medical community and the patient population, hence the 10-Week Hypothesis.

- **18-Week Hair Count** - We concluded your request for validation of the Study's hair counts was actually very worthwhile because we would be validating the accuracy of the Study's results. That was the justification for Midwest to conduct the recount with an additional independent individual, plus a fifth Midwest internal recount.

Recounts/Validations

- 1) On the following seven pages, I have provided the results of the five recounts Midwest has performed on the subsample representing 53% of the Subjects.
- 2) There is no change to the proposed data to be presented as was discussed in my letter of October 30, 2009 and you approved on November 25, 2009:

Hi Helmut,

Thank you for assenting to FDA's request for a re-count of a subset of your clinical data, which will help to address FDA's main statistical concerns. It is noted that you are concerned regarding the use of the word "agreement," which you interpreted to imply some kind of confidence interval approach. This is not what was intended by this request; however, it is clear from your response letter that you have given this matter a great deal of careful thought.

Your proposal appears to be based on tabulating the re-counts from three separate raters, then comparing that to the original count in two ways: absolute difference (difference of average recount from original count, referred to as "recount to initial variance") and percent difference (the difference of average recount from original count, divided by the original count, referred to as "variance from initial count"). You have also stated that you will then average the percent difference values for an overall estimate of accuracy "overall accuracy variance." Such a table will be generated for each of the three time-points (baseline, 10 week, and 18 week). This is an acceptable solution to FDA's request.

Your concern regarding potential differences in hair re-counts (slightly greater than 5%) is noted. FDA anticipates that there would be some variability in these hair counts, and is primarily interested in having some estimate of this variability. Please note that, while it is not possible at this time to set forth a specific threshold value which would raise concerns regarding non-agreement, a value slightly over 5% is unlikely to be cause for concern.

You may proceed with your hair recount methodology.

Again, if you have any questions, please contact me.

Regards,
Atiq

- 3) However, I do believe the format presented provides you a much clearer definition of the specifics regarding the recount results. Any results that we feel require explanation and/or consideration are marked with a red arrow  and presented after the results on pages 5 thru 11. More specifically and in chronological order: #7, #16, #30, and #32.

Study Count Validation

#	Hair Count Type	Subject ID#	Initial	10-Week	18-Week	Initial	Difference	Initial	Recount
			Hair Count	Hair Count	Hair Count	To 18-WK Hair Count	To Study 18-Week Hair Count	To 18-WK Hair Count	Variance % Change From Study
1	Original Study Results	(b)(6)	103	138	138	35		34%	
	Validator - #1	(b)(6)	104	139	138	34	(1)	33%	-1.3%
	Validator - #2	(b)(6)	104	139	138	34	(1)	33%	-1.3%
	Validator - #3	(b)(6)	104	139	141	37	2	36%	1.6%
	Validator - #4	(b)(6)	104	135	134	30	(5)	29%	-5.1%
	Midwest Validator - #5	(b)(6)	103	135	138	35	0	34%	0.0%
	Validation #1 thru #5 Average	(b)(6)	104	137	138	34	(1)	33%	-1.2%
2	Original Study Results	(b)(6)	92	136	139	47		51%	
	Validator - #1	(b)(6)	94	136	141	47	0	50%	-1.1%
	Validator - #2	(b)(6)	94	136	137	43	(4)	46%	-4.3%
	Validator - #3	(b)(6)	93	135	138	45	(2)	48%	-2.7%
	Validator - #4	(b)(6)	94	138	141	47	0	50%	-1.1%
	Midwest Validator - #5	(b)(6)	92	136	139	47	0	51%	0.0%
	Validation #1 thru #5 Average	(b)(6)	93	136	139	46	(1)	49%	-1.8%
3	Original Study Results	(b)(6)	55	74	117	62		113%	
	Validator - #1	(b)(6)	55	78	117	62	0	113%	0.0%
	Validator - #2	(b)(6)	53	74	117	64	2	121%	8.0%
	Validator - #3	(b)(6)	55	74	118	63	1	115%	1.8%
	Validator - #4	(b)(6)	53	74	113	60	(2)	113%	0.5%
	Midwest Validator - #5	(b)(6)	55	74	117	62	0	113%	0.0%
	Validation #1 thru #5 Average	(b)(6)	54	75	116	62	0	115%	2.1%
4	Original Study Results	(b)(6)	22	29	29	7		32%	
	Validator - #1	(b)(6)	22	30	30	8	1	36%	4.5%
	Validator - #2	(b)(6)	21	29	30	9	2	43%	11.0%
	Validator - #3	(b)(6)	22	29	29	7	0	32%	0.0%
	Validator - #4	(b)(6)	22	29	30	8	1	36%	4.5%
	Midwest Validator - #5	(b)(6)	22	29	30	8	1	36%	4.5%
	Validation #1 thru #5 Average	(b)(6)	22	29	30	8	1	37%	4.9%
5	Original Study Results	(b)(6)	65	51	98	33		51%	
	Validator - #1	(b)(6)	66	51	97	31	(2)	47%	-3.8%
	Validator - #2	(b)(6)	65	51	97	32	(1)	49%	-1.5%
	Validator - #3	(b)(6)	65	51	96	31	(2)	48%	-3.1%
	Validator - #4	(b)(6)	65	52	96	31	(2)	48%	-3.1%
	Midwest Validator - #5	(b)(6)	65	51	97	32	(1)	49%	-1.5%
	Validation #1 thru #5 Average	(b)(6)	65	51	97	31	(2)	48%	-2.6%

41

Study Count Validation

#	Hair Count Type	Subject ID#	Initial Hair Count	10-Week Hair Count	18-Week Hair Count	Initial To 18-WK Hair Count Change	Difference To Study 18-Week Hair Count	Initial To 18-WK Hair Count Change %	Recount Variance % Change From Study
6	Original Study Results	(b)(6)	105	121	141	36		34%	
	Validator - #1		108	129	145	37	1	34%	0.0%
	Validator - #2		103	120	140	37	1	36%	1.6%
	Validator - #3		103	124	137	34	(2)	33%	-1.3%
	Validator - #4		101	121	140	39	3	39%	4.3%
	Midwest Validator - #5		103	121	139	36	0	35%	0.7%
	Validation #1 thru #5 Average		104	123	140	37	1	35%	1.1%
7	Original Study Results	(b)(6)	59	107	131	72		122%	
	Validator - #1		60	107	127	67	(5)	112%	-10.4%
	Validator - #2		60	107	127	67	(5)	112%	-10.4%
	Validator - #3		60	106	127	67	(5)	112%	-10.4%
	Validator - #4		60	106	126	66	(6)	110%	-12.0%
	Midwest Validator - #5		59	107	133	74	2	125%	3.4%
	Validation #1 thru #5 Average		60	107	128	68	(4)	114%	-7.9%
8	Original Study Results	(b)(6)	102	121	134	32		31%	
	Validator - #1		110	121	136	26	(6)	24%	-7.7%
	Validator - #2		108	121	137	29	(3)	27%	-4.5%
	Validator - #3		106	122	136	30	(2)	28%	-3.1%
	Validator - #4		106	121	133	27	(5)	25%	-5.9%
	Midwest Validator - #5		102	122	138	36	4	35%	3.9%
	Validation #1 thru #5 Average		106	121	136	30	(2)	28%	-3.5%
9	Original Study Results	(b)(6)	42	54	60	18		43%	
	Validator - #1		42	55	60	18	0	43%	0.0%
	Validator - #2		43	55	60	17	(1)	40%	-3.3%
	Validator - #3		42	55	60	18	0	43%	0.0%
	Validator - #4		42	54	60	18	0	43%	0.0%
	Midwest Validator - #5		42	54	60	18	0	43%	0.0%
	Validation #1 thru #5 Average		42	55	60	18	(0)	42%	-0.7%
10	Original Study Results	(b)(6)	77	98	110	33		43%	
	Validator - #1		77	98	111	34	1	44%	1.3%
	Validator - #2		77	98	111	34	1	44%	1.3%
	Validator - #3		77	97	110	33	0	43%	0.0%
	Validator - #4		76	97	110	34	1	45%	1.9%
	Midwest Validator - #5		77	98	111	34	1	44%	1.3%
	Validation #1 thru #5 Average		77	98	111	34	1	44%	1.2%

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Study Count Validation

#	Hair Count Type	Subject ID#	Initial	10-Week	18-Week	Initial To 18-WK	Difference To Study	Initial To 18-WK	Recount
			Hair Count	Hair Count	Hair Count	Hair Count	18-Week	Hair Count	% Change
11	Original Study Results	(b)(6)	81	131	148	67		83%	
	Validator - #1	(b)(6)	81	130	147	66	(1)	81%	-1.2%
	Validator - #2		81	130	148	67	0	83%	0.0%
	Validator - #3		81	130	146	65	(2)	80%	-2.5%
	Validator - #4		81	130	147	66	(1)	81%	-1.2%
	Midwest Validator - #5		81	130	148	67	0	83%	0.0%
	Validation #1 thru #5 Average		81	130	147	66	(1)	82%	-1.0%
12	Original Study Results	(b)(6)	85	132	156	71		84%	
	Validator - #1	(b)(6)	89	131	156	67	(4)	75%	-8.2%
	Validator - #2		85	130	156	71	0	84%	0.0%
	Validator - #3		85	132	156	71	0	84%	0.0%
	Validator - #4		85	128	157	72	1	85%	1.2%
	Midwest Validator - #5		85	131	156	71	0	84%	0.0%
	Validation #1 thru #5 Average		85.8	130.4	156.2	70.4	(1)	82%	-1.4%
13	Original Study Results	(b)(6)	95	134	186	91		96%	
	Validator - #1	(b)(6)	97	134	186	86	(5)	89%	-7.1%
	Validator - #2		97	132	186	89	(2)	92%	-4.0%
	Validator - #3		99	134	185	86	(5)	87%	-8.9%
	Validator - #4		97	134	186	89	(2)	92%	-4.0%
	Midwest Validator - #5		95	134	186	91	0	96%	0.0%
	Validation #1 thru #5 Average		97	134	186	88	(3)	91%	-4.8%
14	Original Study Results	(b)(6)	65	81	111	46		71%	
	Validator - #1	(b)(6)	68	82	111	43	(3)	63%	-7.5%
	Validator - #2		65	82	111	46	0	71%	0.0%
	Validator - #3		65	80	110	45	(1)	69%	-1.5%
	Validator - #4		64	81	111	47	1	73%	2.7%
	Midwest Validator - #5		65	81	111	46	0	71%	0.0%
	Validation #1 thru #5 Average		65	81	111	45	(1)	69%	-1.3%
15	Original Study Results	(b)(6)	95	99	127	32		34%	
	Validator - #1	(b)(6)	96	105	126	30	(2)	31%	-2.4%
	Validator - #2		95	105	128	33	1	35%	1.1%
	Validator - #3		94	104	127	33	1	35%	1.4%
	Validator - #4		95	105	127	32	0	34%	0.0%
	Midwest Validator - #5		94	105	126	32	0	34%	0.4%
	Validation #1 thru #5 Average		95	105	127	32	0	34%	0.1%

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Study Count Validation

#	Hair Count Type	Subject ID#	Initial	10-Week	18-Week	Initial	Difference	Initial	Recount
			Hair Count	Hair Count	Hair Count	To 18-WK Hair Count Change	To Study 18-Week Hair Count	To 18-WK Hair Count Change %	Variance % Change From Study
16	Original Study Results	(b)(6)	52	72	77	25		48%	
	Validator - #1	(b)(6)	54	72	79	25	0	46%	-1.8%
	Validator - #2	(b)(6)	52	72	79	27	2	52%	3.8%
	Validator - #3	(b)(6)	42	72	79	37	12	88%	40.0%
	Validator - #4	(b)(6)	42	70	80	38	13	90%	42.4%
	Midwest Validator - #5	(b)(6)	52	72	80	28	3	54%	5.8%
	Validation #1 thru #5 Average	(b)(6)	48	72	79	31	6	66%	18.1%
17	Original Study Results	(b)(6)	67	84	93	26		39%	
	Validator - #1	(b)(6)	67	85	92	25	(1)	37%	-1.5%
	Validator - #2	(b)(6)	67	85	92	25	(1)	37%	-1.5%
	Validator - #3	(b)(6)	67	85	94	27	1	40%	1.5%
	Validator - #4	(b)(6)	67	87	93	26	0	39%	0.0%
	Midwest Validator - #5	(b)(6)	67	84	93	26	0	39%	0.0%
	Validation #1 thru #5 Average	(b)(6)	67	85	93	26	(0)	39%	-0.3%
18	Original Study Results	(b)(6)	80	113	92	12		15%	
	Validator - #1	(b)(6)	82	110	92	10	(2)	12%	-2.8%
	Validator - #2	(b)(6)	80	110	92	12	0	15%	0.0%
	Validator - #3	(b)(6)	80	108	92	12	0	15%	0.0%
	Validator - #4	(b)(6)	80	110	91	11	(1)	14%	-1.3%
	Midwest Validator - #5	(b)(6)	80	112	92	12	0	15%	0.0%
	Validation #1 thru #5 Average	(b)(6)	80	110	92	11	(1)	14%	-0.8%
19	Original Study Results	(b)(6)	81	99	129	48		59%	
	Validator - #1	(b)(6)	84	100	131	47	(1)	56%	-3.3%
	Validator - #2	(b)(6)	81	100	131	50	2	62%	2.5%
	Validator - #3	(b)(6)	81	99	131	50	2	62%	2.5%
	Validator - #4	(b)(6)	82	100	131	49	1	60%	0.5%
	Midwest Validator - #5	(b)(6)	80	101	131	51	3	64%	4.5%
	Validation #1 thru #5 Average	(b)(6)	82	100	131	49	1	61%	1.3%
20	Original Study Results	(b)(6)	102	114	154	52		51%	
	Validator - #1	(b)(6)	103	114	155	52	0	50%	-0.5%
	Validator - #2	(b)(6)	103	114	155	52	0	50%	-0.5%
	Validator - #3	(b)(6)	104	114	154	50	(2)	48%	-2.9%
	Validator - #4	(b)(6)	102	113	160	58	6	57%	5.9%
	Midwest Validator - #5	(b)(6)	102	114	155	53	1	52%	1.0%
	Validation #1 thru #5 Average	(b)(6)	102.8	113.8	155.8	53	1	52%	0.6%

Study Count Validation

#	Hair Count Type	Subject ID#	Initial Hair Count	10-Week Hair Count	18-Week Hair Count	Initial To 18-WK Hair Count Change	Difference To Study 18-Week Hair Count	Initial To 18-WK Hair Count Change %	Recount Variance % Change From Study
21	Original Study Results	(b)	121	147	154	33		27%	
	Validator - #1		122	147	155	33	0	27%	-0.2%
	Validator - #2		120	147	155	35	2	29%	1.9%
	Validator - #3		120	146	154	34	1	28%	1.1%
	Validator - #4		116	147	155	39	6	34%	6.3%
	Midwest Validator - #5		121	150	154	33	0	27%	0.0%
	Validation #1 thru #5 Average		120	147	155	35	2	29%	1.8%
22	Original Study Results	(b)(6)	100	128	230	130		130%	
	Validator - #1		100	128	235	135	5	135%	5.0%
	Validator - #2		99	128	236	137	7	138%	8.4%
	Validator - #3		100	127	235	135	5	135%	5.0%
	Validator - #4		100	124	234	134	4	134%	4.0%
	Midwest Validator - #5		99	129	233	134	4	135%	5.4%
	Validation #1 thru #5 Average		100	127	235	135	5	136%	5.5%
23	Original Study Results	(b)(6)	84	97	103	19		23%	
	Validator - #1		84	100	103	19	0	23%	0.0%
	Validator - #2		84	102	102	18	(1)	21%	-1.2%
	Validator - #3		84	98	102	18	(1)	21%	-1.2%
	Validator - #4		84	100	102	18	(1)	21%	-1.2%
	Midwest Validator - #5		84	102	103	19	0	23%	0.0%
	Validation #1 thru #5 Average		84	100	102	18	(1)	22%	-0.7%
24	Original Study Results	(b)(6)	98	126	153	55		56%	
	Validator - #1		99	126	155	56	1	57%	0.4%
	Validator - #2		99	124	155	56	1	57%	0.4%
	Validator - #3		100	126	158	58	3	58%	1.9%
	Validator - #4		99	123	155	56	1	57%	0.4%
	Midwest Validator - #5		99	126	153	56	1	57%	0.4%
	Validation #1 thru #5 Average		99	125	155	56	1	57%	0.7%
25	Original Study Results	(b)(6)	82	147	170	88		107%	
	Validator - #1		85	146	171	86	(2)	101%	-6.1%
	Validator - #2		83	147	171	88	0	106%	-1.3%
	Validator - #3		82	146	172	90	2	110%	2.4%
	Validator - #4		83	146	170	87	(1)	105%	-2.5%
	Midwest Validator - #5		82	147	169	87	(1)	106%	-1.2%
	Validation #1 thru #5 Average		83	146	171	88	(0)	106%	-1.7%

Study Count Validation

#	Hair Count Type	Subject ID#	Initial Hair Count	10-Week Hair Count	18-Week Hair Count	Initial	Difference	Initial	Recount
						To 18-WK Hair Count	To Study 18-Week Hair Count	To 18-WK Hair Count	Variance % Change From Study
26	Original Study Results	(b)(6)	88	104	114	26		30%	
	Validator - #1	(b)(6)	88	103	113	25	(1)	28%	-1.1%
	Validator - #2		88	103	112	24	(2)	27%	-2.3%
	Validator - #3		87	105	113	26	0	30%	0%
	Validator - #4		87	107	112	25	(1)	29%	-0.8%
	Midwest Validator - #5		88	102	114	26	0	30%	0.0%
	Validation #1 thru #5 Average		88	104	113	25	(1)	29%	-0.8%
27	Original Study Results	(b)(6)	88	133	140	52		59%	
	Validator - #1	(b)(6)	90	136	140	50	(2)	56%	-3.5%
	Validator - #2		88	136	139	51	(1)	58%	-1.1%
	Validator - #3		88	137	138	50	(2)	57%	-1.6%
	Validator - #4		86	136	139	53	1	62%	2.5%
	Midwest Validator - #5		87	135	140	53	1	61%	1.8%
	Validation #1 thru #5 Average		88	130	134	51	(1)	59%	-0.4%
28	Original Study Results	(b)(6)	62	82	92	30		48%	
	Validator - #1	(b)(6)	64	83	93	29	(1)	45%	-3.1%
	Validator - #2		63	83	93	30	0	48%	-0.8%
	Validator - #3		63	83	94	31	1	49%	0.8%
	Validator - #4		63	82	94	31	1	49%	0.8%
	Midwest Validator - #5		62	82	94	32	2	52%	3.2%
	Validation #1 thru #5 Average		63	83	94	31	1	49%	0.2%
29	Original Study Results	(b)(6)	134	161	190	56		42%	
	Validator - #1	(b)(6)	134	161	192	58	2	43%	1.5%
	Validator - #2		134	161	191	57	(1)	43%	0.7%
	Validator - #3		133	160	192	59	2	44%	2.6%
	Validator - #4		134	162	193	59	3	44%	2.2%
	Midwest Validator - #5		134	161	190	56	0	42%	0.0%
	Validation #1 thru #5 Average		134	161	192	58	1	43%	1.4%
30	Original Study Results	(b)(6)	102	132	153	51		50%	
	Validator - #1	(b)(6)	101	131	156	55	4	54%	4.5%
	Validator - #2		103	129	156	53	2	51%	1.5%
	Validator - #3		119	131	156	37	(14)	31%	-18.9%
	Validator - #4		102	127	154	52	1	51%	1.0%
	Midwest Validator - #5		101	132	156	55	4	54%	4.5%
	Validation #1 thru #5 Average		105	130	156	50	(1)	48%	-1.5%

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Study Count Validation

#	Hair Count Type	Subject ID#	Initial	10-Week	18-Week	Initial	Difference	Initial	Variance From Study
			Hair Count	Hair Count	Hair Count	To 18-WK Hair Count	To Study 18-Week Hair Count	To 18-WK Hair Count	
31	Original Study Results	(b)(6)	58	137	133	75		129%	
	Validator - #1		60	138	137	77	2	128%	-1.0%
	Validator - #2		60	139	137	77	2	128%	-1.0%
	Validator - #3		60	136	136	76	1	127%	-2.6%
	Validator - #4		60	132	136	76	1	127%	-2.6%
	Midwest Validator - #5		58	137	137	79	4	136%	6.9%
	Validation #1 thru #5 Average		60	136	137	77	2	129%	-0.1%
32	Original Study Results	(b)(6)	93	130	185	92		99%	
	→ Validator - #1		100	133	185	85	(7)	85%	-13.9%
	Validator - #2		93	134	185	92	0	99%	0.0%
	Validator - #3		92	133	184	92	0	100%	1.1%
	Validator - #4		92	130	185	93	1	101%	2.2%
	Midwest Validator - #5		93	133	184	91	(1)	98%	-1.1%
	Validation #1 thru #5 Average		94	133	185	91	(1)	97%	-2.4%
33	Original Study Results	(b)(6)	82	170	232	150		183%	
	Validator - #1		82	171	234	152	2	185%	2.4%
	Validator - #2		81	171	234	153	3	189%	6.0%
	Validator - #3		82	172	233	151	1	184%	1.2%
	Validator - #4		80	169	228	148	(2)	185%	2.1%
	Midwest Validator - #5		82	168	232	150	0	183%	0.0%
	Validation #1 thru #5 Average		81	170	232	151	1	185%	2.3%

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Recount/Validation Results

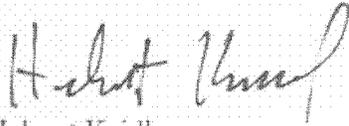
- 1) (b)(6) - The average change by the re counters was (7.9%) with a high variance of (12.0%) and a low of +3.4%. These percentages represented a change in hair count of a high of (6) to a low of +2. Her original reported results were a +122%, therefore adding in the highest, lowest, and/or the average does not change her results as to "confirming" the hypothesis.
- 2) (b)(6) - The average change by the re counters was +66% with a high variance of +42.4% and a low of (1.8%). These percentages represented a change in hair count of a high of +13 to a low of 0. Her original reported results were a +48%, therefore adding in the highest, lowest, and/or the average does not change her results as to "confirming" the hypothesis.
- 3) (b)(6) - The average change by the re counters was a (1.5%) with a high variance of (18.9%) and a low of +1.0%. These percentages represented a change in hair count of a high of (14) to a low of +1. Her original reported results were a +50%, therefore adding in the highest, lowest, and/or the average does not change her results as to "confirming" the hypothesis.
- 4) (b)(6) - The average change by the re counters was a (2.4%) with a high variance of (13.9%) and a low of 0%. These percentages represented a change in hair count of a high of (7) to a low of 0. Her original reported results were a +99%, therefore adding in the highest, lowest, and/or the average does not change her results as to "confirming" the hypothesis.
- 5) There were no changes, considerations, and/or recount results that altered the Overall Confirmation of the 18-Week Hypothesis. I call your attention to the following subjects:
 - (b)(6) had a hair count result that did not confirm the hypothesis (15%). Adding in the highest, lowest, and/or the average did not change her results as to "not confirming" the hypothesis.
 - (b)(6) had a hair count result that just confirmed the hypothesis (23%). Adding in the highest, lowest, and/or the average did not change her results as to "confirming" the hypothesis.
- 6) We believe the subsample recounts confirmed the capabilities of the MEP-90 as a medical treatment.
- 7) We believe the subsample recounts confirmed the requirement for each patient to be treated and evaluated independently and prohibits any statements regarding population.

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As per your request, and with this submission, we believe we have now provided you all of the mandatory information to justify the approval of 510(k) K091496.

Sincerely yours;

Midwest RF, LLC



Helmut Keidl
President

cc: L. Weinstein