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Holiday Inn Bethesda
8120 Wisconsin Avenue
Bethesda, Maryland

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FOR THE TREATMENT OF OBSTRUCTIVE SLEEP APENIA AND SNORING**
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Welcome and Introductory Remarks

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3 DR. GENCO: Good morning. We are going to
4 complete the discussion on the classification of intraoral
5 appliances for the treatment of sleep apnea and snoring.
6 First, we have some introductory remarks by Ms. Pamela
7 Scott.

8 MS. SCOTT: Again, welcome to our last day of the
9 dental products meeting. As Dr. Genco has just stated, we
10 will continue our discussion regarding the classification of
11 intraoral appliances for the treatment of snoring and
12 obstructive sleep apnea. This is a continuation of
13 yesterday's discussion.

14 Yesterday, the conflict of interest statement was
15 read into the record.

16 DR. GENCO: Thank you. We will start with an
17 overview by Dr. Sandy Shire who is a dental officer from the
18 Dental Devices Branch.

19 Dr. Shire.

Presentation by FDA

20
21 DR. SHIRE: Good morning, Dr. Genco, panel. Thank
22 you for the opportunity to share the FDA presentation once
23 again. This is the intraoral appliances for the treatment
24 of snoring and sleep apnea. We are asking the panel to

1 classify these devices.

2 Intraoral appliances are currently unclassified
3 for that indication. We are asking the panel to determine
4 an appropriate classification for these devices. In the
5 context of classifying the devices, there are certain issues
6 related to the use of these products that we would like you
7 to consider.

8 These issues will be presented in the form of
9 questions at the end of my presentation. Snoring is both a
10 social and medical problem. Heavy snorers and those who
11 suffer from OSA are more prone to cardiovascular disease
12 than their non-snoring counterparts. The most advanced
13 stage of snoring is obstructive sleep apnea which can cause
14 cardiac, pulmonary and behavioral problems.

15 Whereas snoring means partial obstruction of the
16 airway, apnea means total obstruction. Occasional brief
17 obstructive events are harmless and quite common in the
18 adult population. It is considered pathological when apnea
19 events last over ten seconds each and occur over seven to
20 ten times per hour.

21 In many apnea patients, episodes last over 30
22 seconds each and occur hundreds of times during a night.
23 Such patients may spend half of their sleep time in total
24 airway obstruction. The literature indicates that

1 significant apnea may occur in 35 percent of snorers.

2 Traditional therapeutic modalities for the
3 treatment of snoring and sleep apnea include surgical and
4 medical approaches. The increasing availability of
5 intraoral appliances provides another option for
6 practitioners who would like to avoid surgery or CPAP
7 treatment or who feel that their patient is unlikely to
8 adopt or benefit from significant lifestyle changes that
9 would improve the patient's condition.

10 Oral-appliance therapy offers a noninvasive and
11 reversible treatment option. FDA review of these intraoral
12 appliances is required prior to marketing. Intraoral
13 devices are reviewed in the Dental Devices Branch under the
14 Premarket Notification or 510(k) Program.

15 Reviewers examine the device's extent of claims
16 and have consistently required prescription labeling; that
17 is, that these devices be dispensed under the supervision of
18 a dentist or a physician. We have been challenged a number
19 of times on that point and we hope that the panel takes into
20 consider discussion of the suitability of over-the-counter
21 sales for these products.

22 For devices that seek to claim treatment for OSA,
23 the Dental Branch also recommends that the sponsor submit
24 clinical data to support the safe and efficacious use of the

1 device. Under the 510(k) program, we can request clinical
2 data.

3 Many intraoral devices have been cleared for
4 market. The devices fall into three distinct categories.
5 They are mandibular-positioning devices, tongue-retaining
6 devices and palatal-lifting devices. Most of the devices
7 that we have cleared have been of the mandibular-positioning
8 type although a handful have been of the other two types.

9 The mandibular-positioning devices are designed to
10 move the mandible into a more anterior position and provide
11 support for the jaw at rest. This is intended to create a
12 larger air space thereby decreasing air turbulence and
13 tissue vibration which is responsible for snoring.

14 Tongue-retaining devices are intended to increase
15 airway patency by supporting the tongue in an anterior
16 position. Palatal-lifting devices are designed to lift the
17 soft palate, thereby also creating a larger air space.

18 The Dental Branch has considered these devices to
19 be appropriate for prescription dispensing because of the
20 possibility of missed diagnoses of more serious conditions
21 and, in addition, musculoskeletal problems may occur when
22 lay persons attempt to advance and support the mandible in a
23 forward position.

24 Resulting pain or injury to the temporomandibular

1 joint or other orofacial structures could create additional
2 problems for the patient if the mandible is advanced too far
3 or too rapidly.

4 The panel will be asked to evaluate whether
5 prescription labeling will be appropriate and what factors
6 should be considered if over-the-counter availability for
7 these products is considered. By "those factors," I mean
8 special controls such as labeling.

9 The panel should also consider any special
10 labeling considerations such as precautions or
11 contraindications. I am sure you all remember from the
12 training that you have had this week the differences between
13 the classes of devices. We are asking you to put the device
14 in class I, class II or class III based on the amount of
15 regulatory oversight you think the agency should suggest for
16 these products.

17 I can go right to the questions.

18 [Slide.]

19 Please consider the following questions during
20 your discussion of intraoral devices for the treatment of
21 snoring and sleep apnea. Question 1; should the agency
22 continue to consider all three types of intraoral appliances
23 for snoring and sleep apnea--that is, mandibular
24 repositioners, tongue-retaining devices and palatal lifters-

1 -as one category for the purpose of classification? If not,
2 what features of a device would cause it to fall into a
3 different category?

4 [Slide.]

5 Second question. This question is in three parts.
6 In the context of classification and the possibilities for
7 special controls, please address the following issues in
8 your discussion: design features. Intraoral mandibular-
9 positioning devices are either of a one-piece or two-piece
10 design. Devices that are of a two-piece design are
11 connected together by various mechanical means and can be
12 separated by the patient in the case of an emergency
13 situation.

14 One-piece designs generally include slots or
15 spaces to permit oral breathing. What concerns might be
16 presented by a one-piece design without breathing slots or
17 spaces?

18 Precautions or risks. Are there special
19 instructions or contraindications that the panel can
20 identify related to the use of these devices in patients who
21 wear full or partial removable dentures. Are there other
22 precautions or warnings that could be included in the device
23 labeling?

24 Intraoral devices for the treatment of snoring and

1 sleep apnea have been cleared for market as prescription
2 devices. For this category of devices, would the
3 classification be the same if the products were dispensed as
4 over-the-counter products?

5 [Slide.]

6 The third question; should the agency require the
7 sponsors of intraoral devices that claim to treat sleep
8 apnea to submit clinical data to support that claim? If so,
9 please describe pertinent features for such studies.

10 DR. GENCO: Thank you, Dr. Shire. Are there any
11 comments or questions from the panel?

12 DR. JANOSKY: I am trying to determine the
13 direction or the union between snoring and obstructive sleep
14 apnea. Am I correct in that you said that 35 percent of
15 snorers have apnea?

16 DR. SHIRE: Yes.

17 DR. JANOSKY: What about the other directionality,
18 if you have apnea, are you necessarily a snorer? They seem
19 to be two somewhat distinct things to me and I am not sure--

20 DR. SHIRE: We are talking about obstructive sleep
21 apnea. In that sense, and I am going to defer to the panel
22 here--

23 DR. FURST: Obstructive sleep apnea can almost be
24 thought of as a more severe form of snoring. Snoring

1 occurs, as you fall asleep, you relax, your throat relaxes,
2 the airway collapses, becomes smaller and the airflow
3 becomes turbulent causing vibration primarily of the uvula
4 and soft palate.

5 As you get deeper into sleep, primarily, and as
6 you relax more, or if you are laying on your back, things
7 collapse more. The airway gets smaller and smaller until,
8 in many cases, it collapses completely. The person is
9 making an effort to breathe but there is no airflow because
10 the airway is obstructed. That is called an apnea event.

11 So it is really a continuum where a sleep apnea is
12 a complete obstruction. A hypopnea, by the way--you may
13 hear that mentioned--is an almost complete obstruction but
14 there is still some airflow.

15 DR. JANOSKY: So there is some degree of snoring
16 where you are sure there is apnea; am I correct in that?

17 DR. FURST: Not 100 percent of people with
18 obstructive sleep apnea snore, but most of them do. Almost
19 all of them do.

20 DR. JANOSKY: So, individuals, if they are, let's
21 say, diagnosed with obstructive sleep apnea might not,
22 necessarily, snore.

23 DR. FURST: That's correct, especially patients
24 who have had surgery for correction of snoring or sleep

1 apnea. Many of those patients will be silent apneics.

2 DR. HENDLER: The real issue is silent apneics.

3 Most of the time--and we are talking about 99.9 percent of
4 time--people that have sleep apnea snore. Basically, when
5 you remove the snoring marker for sleep apnea, you make it
6 silent by either surgery or an oral appliance, you can still
7 have apneic events but they can be silent apneic events.

8 We talked a little bit about this yesterday. One
9 of the important things that happens that gets patients to
10 treatment is that their bed partners will hear their snoring
11 and then, when it stops, they will know that they are not
12 breathing. So, if they have a silent apneic event, this
13 can't be picked up by someone easily.

14 Very frequently, we see patients who come in and
15 we say, "Why are you coming in?" "I feel lousy during the
16 day because I am not getting real good sleep but my wife
17 told me that I stop breathing while I am sleeping."

18 It is the snoring marker that is critically
19 important in evaluating a lot of these patients initially.

20 DR. JANOSKY: So we actually could use snoring as
21 a marker and determining sensitivity and specificity of the
22 diagnosis of apnea if the surgery hasn't occurred?

23 DR. HENDLER: It is one of the early clues. We
24 will address that, I think, as we go along.

1 DR. CLARK: One last comment. There is a
2 condition called upper airway resistance syndrome. There
3 are no apneas but, because the airway is narrow, you need to
4 have increasing effort to ventilate yourself. That raises
5 your sleep level and then you get subsequent hypersomnolence
6 or sleepiness during the day which is somewhat dangerous and
7 disruptive to your life without any apnea at all.

8 So there is sort of a bridging condition between
9 the two.

10 DR. GENCO: Thank you, Dr. Clark. Any other
11 comments or questions?

12 MR. LARSON: Just a question. I can see this
13 heading in a direction to suggest that antisnoring devices
14 are dangerous because they mask apnea but what percentage of
15 snorers have apnea? That goes the other way.

16 DR. FURST: It depends on what study you look at
17 but anywhere from 25 to, on some studies, up to 50 percent
18 of adults. Most of these studies have looked at adults
19 males who snore habitually will have at least some measure
20 of sleep apnea, mild sleep apnea. So it is a very common
21 condition among snorers. Even in the studies that suggest
22 25 percent, it is still a very high percentage.

23 DR. GENCO: We are addressing questions to Dr.
24 Shire, if you don't mind. Dr. Hendler is going to give us

1 an overview. Are there any other questions of Dr. Shire
2 about our charge?

3 Thank you very much, Dr. Shire.

4 Now, it appears that there are more people in the
5 audience than yesterday, so I would like to ask Pam to go
6 through the introductions again.

7 MS. SCOTT: I am going to briefly reintroduce our
8 panel members, panel consultants, and our guests for today.
9 Acting as our chair is Dr. Robert Genco. He is the
10 distinguished professor and chair with the Department of
11 Oral Biology at the State University of New York at Buffalo.

12 We have Janine Janosky who is assistant professor
13 with the Department of Family Medicine and Clinical
14 Epidemiology at the University of Pittsburgh. We have Dr.
15 Mark Patters who is the chair of the Department of
16 Periodontology at the College of Dentistry at the University
17 of Tennessee and Dr. Willie Stephens who is the associate
18 surgeon, Division of Maxillofacial Surgery at Brigham and
19 Women's Hospital.

20 Dr. Donald Altman is our consumer representative.
21 He is the chief of the office of oral health with the
22 Arizona Department of Health Services. Mr. Floyd Larson is
23 our industry representative and he is the president of
24 Pacific Materials and Interfaces.

1 Dr. James Drummond is also with us today. He is a
2 professor of restorative dentistry at the University of
3 Illinois at Chicago. We also have Dr. Leslie Heffez who is
4 professor and department head of oral and maxillofacial
5 surgery at the University of Illinois at Chicago.

6 We have Dr. Andrea Morgan who is a clinical
7 instructor with the Department of Restorative Dentistry at
8 the University of Maryland Dental School. And we have Dr.
9 Diane Rekow who is the chairperson for the Department of
10 Orthodontics at the University of Medicine and Dentistry of
11 New Jersey.

12 Our invited guests for today include Dr. Glenn
13 Clark who is the chair of the Section of Diagnostic Sciences
14 and Orofacial Pain at the University of California in Los
15 Angeles. We have Dr. Eric Furst who is an ear, nose,
16 throat, head and neck surgeon. He is board certified and he
17 practices in Springfield, Virginia. We have Dr. Barry
18 Hendler who is an associate professor of oral and
19 maxillofacial surgery, the director or postgraduate medical
20 education and the coordinator of laser and cosmetic surgery
21 at the University of Pennsylvania Medical Center.

22 DR. GENCO: Thank you, Pam.

23 We will now have a presentation by Dr. Barry
24 Hendler to give the panel and the audience an overview of

1 some of the concepts that we will be dealing with.

2 Dr. Hendler.

3 **Guest Presentation**

4 DR. HENDLER: I would like to thank the panel for
5 the opportunity of presenting this information. We talked a
6 little bit about snoring and sleep apnea. We are actually
7 dealing with two issues. One is primary snoring where
8 people make noise when they sleep and the other one is
9 obstructive sleep apnea and upper airway resistance.

10 I think that those two things are actually tied
11 together very strongly because people that snore can have
12 sleep apnea as well as just primary snoring.

13 When we deal with snoring, we are dealing with
14 relatively healthy individuals who don't have any of the
15 signs of poor sleep, excessive daytime sleepiness,
16 headaches, develop of hypertension, et cetera. But when
17 patients develop obstructive sleep apnea, not only do they
18 have significant morbidity associated with their life but
19 potentially life-threatening disease when you deal with the
20 types of sleep apnea.

21 When you deal with sleep apnea, you have to think
22 in terms of the use of oral appliances of different types of
23 sleep apnea. There is mild sleep apnea and that generally
24 represents patients that have respiratory disturbance

1 indexes--that is, the numbers of apneas and hypopneas per
2 hour of sleep that is less than 20.

3 Then there are people who have moderate
4 obstructive sleep apnea and their respiratory disturbance
5 indexes are usually 20 to 40. And those that have more
6 severe types, 40 and greater.

7 All of these patients that have sleep apnea have
8 associated oxygen desaturations. Those levels of oxygen
9 desaturations are very significant in some patients and less
10 in others. One of the interesting pieces of literature that
11 has come out is practice parameters of treatment of snoring
12 and sleep apnea that was developed by the American Sleep
13 Disorders Association.

14 This American Sleep Disorders Association, it is
15 my understanding, was initially developed in the late '70's
16 for those physicians who were interested in an area that
17 other physicians weren't and that was sleep medicine. It
18 evolved through the development of the American Board of
19 Sleep Medicine which is recognized by the American Medical
20 Association.

21 These clinical guidelines were developed in 1995.
22 They were based on an intense literature search to try to
23 determine the efficacy of various oral appliances. They
24 developed some very interesting recommendations which I

1 would like to share with the panel that may help you
2 understand a little bit about how oral appliances work.

3 The first is, in the diagnosis recommendation, and
4 I will read it verbatim, "The presence or absence of
5 obstructive sleep apnea must be determined before initiating
6 treatment with oral appliances to identify those patients at
7 risk due to compliances of sleep apnea and to provide a
8 baseline to establish the effectiveness of subsequent
9 treatment.

10 One of the things about obstructive sleep apnea
11 that actually is a no-brainer is that you can really judge
12 the efficacy of your treatment by getting pre- and post-
13 operative polysomnography, their sleep studies.

14 If you get a pre-treatment polysomnography and it
15 shows certain data, you then treat your patient and that
16 polysomnography has returned to normal, then you really have
17 a very excellent way of determining your success. There is
18 very little that needs to be done anecdotally.

19 One of the problems is patients coming back to get
20 repeat sleep studies. One of the doctors yesterday
21 mentioned the fact that insurance doesn't cover post-
22 insertion polysomnography in his area. In our area it does
23 so that when we treat patients, and we have to get post-
24 operative or post-treatment polysomnography, insurance

1 companies cover it.

2 That is our way of determining whether we are
3 successful in treatment or not. The treatment objectives or
4 oral appliances are the following: for patients with primary
5 snoring without obstructive sleep apnea and upper airway
6 resistance, the objective of the appliance is to just
7 eliminate the snoring.

8 I can't tell you how many patients I see. I have
9 some affiliation with the Penn Center for Sleep Disorders.
10 I can't tell you how many patients come in and tell me that
11 they haven't slept with their bed partner for six months or
12 a year because they can't sleep because they snore so loud.
13 So their real interest is just getting rid of their snoring.

14 For patients with obstructive sleep apnea, the
15 desired outcome includes the resolution of the clinical
16 signs and symptoms of the obstructive sleep apnea and--and
17 here is the important part--normalization of the apnea-
18 hypopnea index and oxyhemoglobin desaturation.

19 The indication of oral appliances are fairly clear
20 and there is significant data that says that they work. One
21 of the things that studies have shown is that oral
22 appliances have a high degree of success in eliminating or
23 reducing snoring but have less degree of success in
24 eliminating obstructive sleep apnea completely.

1 All patients with moderate to severe sleep apnea
2 should have a trial of CPAP first. CPAP is continuous
3 positive airway pressure. It is a machine that you wear
4 that blows air and acts as a pneumatic splint to open your
5 airway. CPAP is recognized as the best treatment for all
6 types of sleep apnea because it can be adjusted to increase
7 the pressures to get you to breathe normally.

8 The problem with CPAP is compliance. Patients
9 don't want to wear it. They don't like how it feels. They
10 can develop a nasal irritation. They can develop all sorts
11 of side effects from wearing the nose mask. It is
12 cumbersome to carry around. It doesn't look real great when
13 you are sleeping next to somebody and you have got a mask on
14 your face.

15 So all those issues make patients often decline to
16 even try to use it. But CPAP is actually what can cure
17 almost all sleep apnea. So when patients have mild to
18 moderate sleep apnea, oral appliances work well. When they
19 have moderate to severe sleep apnea, there are issues of
20 whether oral appliances really are the most efficacious type
21 of treatment.

22 That is when we start thinking about upper-airway
23 reconstructive surgery because most of the data on oral
24 appliances show that they reduce obstructive sleep apnea 50

1 to 75 percent. When they do and somebody has severe sleep
2 apnea--let's say their respiratory distress index is 80 and
3 you drop it down to 40. You have improved them, but they
4 still have severe sleep apnea.

5 I know where we work at the Penn Center, they are
6 unacceptable results from the use of an oral appliance. We
7 try to get patients to have respiratory distress indexes
8 less than 10 to 15 with oxyhemoglobin desaturations not less
9 than 90 in the patients that we treat.

10 That is not often attainable, but that is our
11 goal. That is our criteria for success.

12 Oral appliances, according to the Sleep Disorders
13 Association are indicated for patients with moderate to
14 severe sleep apnea who are intolerant or refuse treatment
15 with nasal CPAP, as just a way of additionally helping them.
16 But they also make note of the fact that the use of surgery
17 is indicated in some of these patients and, actually, there
18 was some discussion about uvulopharyngopalatoplasty not
19 being a real successful treatment for sleep apnea.

20 Actually, most of the studies now show that
21 uvulopharyngopalatoplasty, in conjunction with maxillofacial
22 surgery, is a much stronger way of treating these patients
23 because it addresses the two primary areas where obstruction
24 occurs, one in the palate and one in the base of the tongue.

1 So if you treat both of those areas simultaneous
2 with surgery, the success rates are much higher.

3 The follow up is very important because it says
4 that the follow up with polysomnography is to insure the
5 therapeutic benefit of oral appliances especially in
6 patients with moderate to severe obstructive sleep apnea.
7 Patients who have moderate to severe obstructive sleep apnea
8 who are treated with oral appliances should return for
9 follow-up office visits.

10 Lastly, but not least, because oral appliances
11 have side effects such as aggravating temporomandibular
12 joint problems, aggravating dental problems, oral appliances
13 should be fitted by qualified personnel who are trained and
14 experienced in the overall care of oral health, the
15 temporomandibular joint, the dental occlusion, the
16 associated oral structures.

17 I guess, in summary, we are dealing with a very
18 complex issue, one that goes from very mild snoring with no
19 associated physical symptoms to life-threatening obstructive
20 sleep apnea. One of the things that is important is that in
21 the whole realm of oral appliances, there have been no
22 randomized, controlled studies.

23 The paper from the American Sleep Disorders
24 Association found in the literature 300 patients who were

1 studied, about 300. I have found in the literature
2 approximately 500 patients in total in studies. It was
3 interesting when I was listening to some of the stuff on
4 oral appliances and people were talking about thousands and
5 thousands and millions of implants placed, I was thinking
6 about the studies in sleep apnea and oral appliances and how
7 we can only find in all the literature about 500 studies.

8 All of these studies are before and after studies,
9 what their polysomnography was before they put the oral
10 appliance in their mouth, polysomnography afterwards. No
11 randomized, controlled studies at all. With tongue-
12 retaining devices, there has only been one primary
13 investigator and there have been zero studies of palatal
14 lifters.

15 So what I hope to do is make the panel aware that
16 the removal of snoring while, in some cases, an important
17 issue for patients, has a potential for many other problems
18 down the road.

19 This issue of patients, for example, self-treating
20 themselves, getting appliances and putting them in their
21 mouth; just imagine the patient who has preexisting
22 temporomandibular joint disease, a reducing click in their
23 joint, and they are not really sure what that means. If
24 they put an oral appliance in their mouth, they develop

1 increased TMJ symptoms. They are not sure what that means
2 and they continue wearing it.

3 Imagine the patient who has advanced periodontal
4 disease who puts an oral appliance in his mouth and loosens
5 all of his teeth because of it because he doesn't realize
6 that those teeth won't support the appliance.

7 So these issues manifest a lot of our scrutiny.

8 DR. GENCO: Thank you very much, Dr. Hendler. Any
9 comments or questions from the panel?

10 DR. ALTMAN: Is there some estimate on the number
11 of people in American that have obstructive sleep apnea?

12 DR. HENDLER: 3 percent of the total population.
13 And we actually think it is higher than that. One of the
14 questions was how many people that snore actually have sleep
15 apnea. You would be shocked at how many people think they
16 don't have sleep apnea and they just have snoring, and when
17 we put them through polysomnography, they find out that they
18 have significant sleep apnea.

19 So I think that some of those numbers are low.
20 This is a disease that is gaining recognition because we are
21 understanding better how to diagnose it.

22 DR. ALTMAN: Can you tell me how many people are
23 currently treated for sleep apnea, how many people a year
24 are treated for sleep apnea?

1 DR. HENDLER: I don't have that.

2 AUDIENCE: Three-quarters of a million.

3 DR. ALTMAN: Thank you. I guess the question is I
4 hear what you are saying but there are, obviously, a lot of
5 people out there that are not being treated for sleep apnea;
6 correct?

7 DR. HENDLER: Right.

8 DR. ALTMAN: What is happening to them?

9 DR. HENDLER: What is happening to them?

10 DR. ALTMAN: Are they living productive lives?

11 DR. HENDLER: Some of them are having difficulty
12 with their lives. Some of them are having difficulty when
13 they work, for example. They have difficulty with
14 mentation, concentration and stuff like that. And they
15 don't realize why.

16 DR. ALTMAN: I guess the problem that I am having
17 here is that there are a lot of people that don't have
18 partners that sleep with them. They have partners that are
19 probably saying "Thank God" when they are not picking up
20 that this person isn't sleeping.

21 I see a lot of people out there that don't have
22 somebody that is going to wake them up or turn them over to
23 a physician or a dentist. So my question is sort of, "So
24 what?"

1 DR. HENDLER: Honestly, I don't think, "So what?"
2 because there was an article in Chest, which is a referee
3 journal for pulmonary physicians, which showed that patients
4 with apnea indexes greater than 20 have significantly
5 increased mortality.

6 DR. ALTMAN: You just told me that it is 3 percent
7 but we don't really even know. We don't know how many
8 people are being treated so how do we even know that number?

9 DR. HENDLER: Basically, the study that was done
10 followed patients who had elevated apnea indexes over
11 several years and their mortality was significantly
12 increased. I don't have the study available with me now.

13 DR. ALTMAN: But are we saying that if people had
14 access to a snoring device, that they are somehow worse off?
15 There are a lot of people that, if they have a snoring
16 device and don't have partners, or have partners that are
17 not noticing they are not breathing, that doesn't make sense
18 to me. Where is the harm here in preventing people from
19 snoring?

20 If they have TMJ problems or skeletomuscular
21 problems, the presentations we had yesterday basically said
22 if you stop using the Snore Guard, or whatever it is called,
23 the symptoms go away. I guess that is pretty much about
24 everything we have over-the-counter.

1 DR. HENDLER: Basically, if somebody snores and
2 they have nobody sleeping with them, they don't know they
3 are snoring.

4 DR. ALTMAN: That is not true. I have woken
5 myself up from snoring.

6 DR. HENDLER: Oh; have you? Maybe you have sleep
7 apnea.

8 DR. ALTMAN: Perhaps I do, but I am a pretty
9 healthy 40-year-old man.

10 DR. HENDLER: It doesn't matter. It could be
11 hurting you.

12 DR. ALTMAN: I guess it comes back to, "So what?"

13 DR. HENDLER: So what?

14 DR. ALTMAN: Yeah.

15 DR. HENDLER: That is your decision. You know
16 what I mean? I mean, really, when you say something like
17 that, that bothers me because you snore and you wake
18 yourself up. You may have other markers of sleep apnea and
19 that you refuse to identify for yourself. It may ultimately
20 hurt you physically.

21 If you choose to do that, that's okay. But my
22 role is to try to help somebody like you if you seek help.

23 DR. ALTMAN: What about the 42 million people that
24 don't even have insurance. I don't even know if medical-

1 dental insurance covers it, but they are not going to their
2 physician or dentist because they can't even afford the
3 office visit. Let me liken this to mouth guards.
4 Obviously, a mouth guard fitted by a dentist is better than
5 the stock mouth guard that you buy at the store.

6 DR. HENDLER: Right.

7 DR. ALTMAN: So, obviously, I will concede that a
8 snoring device fitted by a dentist is different than I could
9 buy over-the-counter.

10 DR. HENDLER: You cannot equivocate a mouth guard-
11 -

12 DR. ALTMAN: I don't see why I can't.

13 DR. HENDLER: --with something that is potentially
14 dangerous to patients. Obstructive sleep apnea is a disease
15 that potentially can hurt people.

16 DR. ALTMAN: Talk to me about snoring.

17 DR. HENDLER: What about it? Talk to you about
18 snoring?

19 DR. ALTMAN: Is snoring dangerous to my health
20 without sleep apnea?

21 DR. HENDLER: Primary snoring alone? No. But
22 there is more to it. If you have snoring and sleep apnea,
23 it is dangerous. How are you ever going to know?

24 DR. ALTMAN: Exactly. What about the 97 percent

1 of the American public that maybe has sleep apnea. Maybe
2 all of us do and we don't know it.

3 DR. GENCO: I am wondering if we could go back to
4 Janine's question to sort this out, what is the relationship
5 between--I mean, there are people who don't have sleep
6 apnea.

7 DR. HENDLER: Right.

8 DR. GENCO: How many people who snore do have
9 sleep apnea? What is the percentage?

10 DR. HENDLER: I, personally, don't have those
11 figures. I think it is higher. I think it is higher than
12 50 percent.

13 DR. GENCO: With respect to obstructive sleep
14 apnea, what are the increased risks? There is a risk for
15 increased accidents. There is a risk for hypertension.
16 There is a risk for cardiovascular disease. Did I hear
17 that?

18 DR. HENDLER: Yes; there is no question about
19 that. There are physical risks and there are also mentation
20 risks. This is a very important public-health issue in
21 terms of people that are airline pilots, truck drivers.

22 DR. GENCO: Dr. Altman, does this help? There is
23 a group that just snores. Then there are snorers,
24 percentage now known but maybe we will get that sorted out

1 later, but a significant number--

2 DR. HENDLER: Significant numbers.

3 DR. GENCO: --who also have sleep apnea. If you
4 have obstructive sleep apnea, then the risk for heart
5 disease, hypertension, accidents go up.

6 DR. ALTMAN: I understand that. I guess where I
7 don't see any proof to me is that we say that the reason why
8 we don't want to have them with a Snore Guard is because
9 then it would take away the fact that they might have sleep
10 apnea and we might not recognize it. That is a bunch of
11 "mights" to me.

12 How many people is that happening to and those few
13 people that that might be happening to, where is the science
14 saying that whatever that amount of people might be, what
15 the detriment might be.

16 You can get anecdotes of pilots and whatever but--

17 DR. HENDLER: Again, I will reiterate the study
18 that shows if you have it and you don't recognize it and you
19 refuse to recognize it, it is a problem. It can hurt you.
20 You increase mortality if you have sleep apnea.

21 DR. GENCO: Thank you. Why don't we address our
22 questions to Dr. Hendler and then we will go to the industry
23 presentations. Then we will have an open discussion.

24 DR. JANOSKY: Two question/comments, actually.

1 You mentioned the CPAP. The CPAP is used to treat sleep
2 apnea; am I correct?

3 DR. HENDLER: Yes.

4 DR. JANOSKY: But you would not use the CPAP to
5 treat snoring?

6 DR. HENDLER: It can be used for snoring also.

7 DR. JANOSKY: But it is very unlikely.

8 DR. HENDLER: It is unlikely because of patient
9 compliance.

10 DR. JANOSKY: So CPAP could be considered as a
11 gold standard for the treatment of sleep apnea?

12 DR. HENDLER: That's correct.

13 DR. JANOSKY: Based on your review of the
14 literature and your practice, have any of these oral
15 appliances been tested using the CPAP as a gold standard?

16 DR. HENDLER: Yes.

17 DR. JANOSKY: They have been.

18 DR. HENDLER: Yes. In selected cases, in patients
19 with mild to moderate apnea, oral appliances can reverse
20 that and cure them. When you get to moderate to severe
21 apnea, it becomes more problematical. Actually, sometimes
22 oral appliances can increase your apnea which is one of the
23 issues that I didn't address with you and that is that some
24 of the studies show that oral appliances improperly placed

1 can actually make apnea worse.

2 DR. JANOSKY: For mild to moderate apnea.

3 DR. HENDLER: Yes. We are really talking about
4 the patients that really need the help.

5 DR. JANOSKY: So for severe apnea, you might or
6 you might not recommend one of these oral appliances over
7 the CPAP.

8 DR. HENDLER: For moderate to severe, you are
9 never going to recommend it above the CPAP. CPAP is going
10 to be number one.

11 DR. JANOSKY: But CPAP has a compliance issue.

12 DR. HENDLER: That has a compliance issue. If the
13 patients don't use CPAP, then, if they have real severe
14 apnea, you may bypass the oral appliances and go right up to
15 upper airway surgery or, if they refuse upper airway
16 surgery, you might offer it to them as a way of ameliorating
17 their severe apnea but not getting it back to normal. And
18 that doesn't happen too often.

19 DR. JANOSKY: Aren't we talking about treating
20 hypertension whether the patient does or does not have
21 cardiovascular disease. Someone gets a blood-pressure
22 measurement, let's treat hypertension. We might not go into
23 cardiovascular disease. Where cardiovascular disease is
24 actually the apnea, hypertension might be the snoring. Is

1 that not the type of model that we are talking about?

2 DR. HENDLER: Run that by me again.

3 DR. JANOSKY: If I think about hypertension,
4 hypertension might or might not be there with cardiovascular
5 disease. But somebody could be identified by a
6 systolic/diastolic blood-pressure rating of having
7 hypertension, hypertension being treated not addressing
8 cardiovascular disease. Is that what we are talking about
9 essentially for snoring and sleep apnea? Is it the same
10 type of model?

11 It might be there or it might not be present,
12 namely the cardiovascular disease or the apnea. That is
13 sort of the model we are talking about?

14 DR. HENDLER: Sort of; yes.

15 DR. JANOSKY: So treating hypertension, in itself,
16 might be useful.

17 DR. HENDLER: Yes.

18 DR. GENCO: Any further comments or questions of
19 Dr. Hendler?

20 DR. STEPHENS: In your experience, what is the
21 percentage of patients with an RDI of between 30 and 40 that
22 have been helped with an oral appliance?

23 DR. HENDLER: We have a study that we are going to
24 publish of about 120 patients. I would say that when you

1 have RDIs in the range of 30 to 40, probably 50 percent of
2 those are brought down to levels of 10 to 15 so that we
3 consider that successful.

4 DR. STEPHENS: Is that percentage the same as
5 patients who report symptomatic improvement or--

6 DR. HENDLER: Usually it goes hand in hand, but it
7 might not. That is one of the reasons that post-treatment
8 polysomnography is so important because patients--their
9 parameters can be normal and they can still say they are
10 having trouble sleeping because they are depressed or
11 whatever.

12 DR. GENCO: Dr. Furst and then I think we are
13 going to have to start with the industry representatives.

14 DR. FURST: One further comment about that. More
15 frequently patients will report that their symptoms are
16 "cured." If you do get them to restudy their sleep, they
17 still have significant apnea. I think that happens more
18 frequently than the other way.

19 I just wanted to point out very briefly, again, to
20 answer your "so what" question, a British study in the early
21 '80's showed a retrospective of fatal car accidents. It
22 showed a very high percentage of patients with fatal car
23 accidents had a history or, in probing families and medical
24 records suggestive of sleep apnea. The conclusion of this

1 study was that a lot of fatal car accidents, a very real
2 public-health issue, may be related to sleep apnea or upper
3 airway resistance in those patients, a very big problem.

4 DR. GENCO: We will now got to the industry
5 representatives and then we will come back to open committee
6 discussion and also I will ask our guests to make any
7 comments at that time.

8 **Presentations by Industry and Associations**

9 DR. GENCO: The first individual from industry is
10 Dr. Dennis Bailey from the Sleep Disorders Dental Society.
11 Dr. Bailey?

12 DR. BAILEY: Good morning.

13 [Slide.]

14 My name is Dennis Bailey. I am a general
15 practicing dentist in the area of Princeton, New Jersey. I
16 have a practice that is limited to temporomandibular
17 disorders, orofacial pain and the treatment of patients with
18 sleep disorders. I am also on the faculty of the University
19 of Medicine and Dentistry of New Jersey in the Department of
20 Oral Medicine.

21 My presentation today is going to be geared
22 towards bringing you up to speed as far as where the Sleep
23 Disorder Dental Society, which I represent as president
24 elect, has a position on this particular issue. We feel

1 very strongly that the Sleep Disorder Dental Society and the
2 American Sleep Disorders Association must work in harmony to
3 resolve this problem.

4 [Slide.]

5 What I want to do in a very short period of time
6 is try to review with you some of the present information
7 that we have as it relates to oral appliance therapy.

8 [Slide.]

9 Snoring and sleep apnea is obviously the target of
10 this discussion.

11 [Slide.]

12 What we must understand as we look at these slides
13 and understand about sleep architecture--and it is sleep
14 architecture that is actually affected and what is seen
15 being affected on polysomnography.

16 Time does not permit me to go into the intricacies
17 of polysomnography because it is a very intricate science.
18 But the basic bottom line is that what you are seeing here
19 is that non-REM sleep and REM sleep are two divided
20 categories of sleep issues.

21 Delta sleep, which I call your attention to at the
22 very bottom there, which is slow-wave sleep, is the
23 restorative sleep phase that most of us hope for on a night-
24 by-night basis. When we are deprived of that phase of

1 sleep, we are deprived of health.

2 The deprivation of delta sleep or slow-wave sleep,
3 is what commonly occurs when sleep is interrupted by
4 conditions such as sleep apnea and snoring.

5 [Slide.]

6 The key issue here, as I am listening to the
7 rhetoric that is going on this morning, is we must
8 understand one basic premise and that is that we, as
9 dentists, are treating a medical disorder. That is
10 paramount to understand. We are not treating a dental
11 disorder.

12 The devices that we are going to talk about that I
13 am going to show you briefly are geared towards the
14 treatment of a medical problem. What you also must
15 understand is that our peers in the medical field, the
16 medical students, get approximately, at the uppermost level
17 in 1997, two hours of education in the sleep field.

18 I recently attended the New Jersey Sleep Society
19 meeting and the head of the Sleep Society from Robert Wood
20 Johnson Hospital spoke. He is addressing this issue because
21 this is a very significant issue.

22 As I listened to Dr. Altman's questions concerning
23 snoring and sleep apnea, I may have snoring, I may not have
24 apnea, it all goes back to the case that many times the

1 physicians are not adequately educated to pick up this
2 disorder. I also want to point out to you that yesterday
3 the gentleman who spoke regarding oral appliances and,
4 basically, comparing that to blood pressure was an excellent
5 comparison.

6 However, he missed the point. The point is that
7 the comparison of the blood pressure being recognized by the
8 dentist does not mandate the dentist to treat it. What it
9 does is it mandates the dentist to help that patient seek
10 treatment. The same is true of snoring and sleep apnea.

11 [Slide.]

12 We notice some of the clinical signs and symptoms.
13 These have been discussed this morning. They were discussed
14 yesterday. I am not going to go into them. You can all
15 read this slide on your own. And they vary based upon the
16 severity of the problem and the length of duration that the
17 problem has actually existed.

18 Many patients will have these problems worse at
19 certain times of the year and they will diminish at other
20 times of the year; for instance, during allergy season,
21 these problems become more pronounced. During the
22 wintertime, these problems become more pronounced.

23 So we can find patients who will have varying
24 degrees of their hypersomnolence or their sleep apnea or

1 their snoring based upon certain seasonal variations. In
2 addition, we have discussed the physiologic sequelae that
3 can occur with this. Again, I am not going to go into all
4 of these particular conditions, but we recognize that they
5 do occur.

6 There is a great debate as to whether or not
7 primary snoring or simple snoring actually does have some
8 impact upon health. There are varying articles that
9 describe that there may be some conditions, cardiovascular,
10 cardiorespiratory, that arise from this particular
11 condition; that is, simple snoring.

12 Available research indicates that there is
13 variability of the effectiveness of the devices. But there
14 is also variability in the effectiveness of CPAP, not when
15 it is worn by in the variability of it being worn. That is
16 one of the issues that we, in the Sleep Disorder Dental
17 Society, feel we have the greatest amount of impact in that
18 we can provide efficacious information that is going to
19 allow us to understand that these devices do, in fact, have
20 some impact upon the improvement of the patient's condition.

21 [Slide.]

22 Oral appliance therapy, I want to go into. This
23 is a cartoon that renders the patient having an apneic or
24 hypopneic attack. You can see that the soft palate, the

1 tongue, the oral-pharyngeal and nasal-pharyngeal airway are
2 collapsing.

3 [Slide.]

4 Here we see the patient wearing an oral device.
5 This would be, obviously, a mandibular-repositioning device
6 or advancement device and it helps to enhance the airway.
7 It brings the jaw forward. It brings the tongue forward and
8 helps the patient to breathe better during sleep.

9 [Slide.]

10 The ASDA clinical guidelines were established. I
11 provided those for you in a packet that was sent to the FDA
12 on October 17 for purposes of elucidating to what Dr.
13 Hendler just recently discussed with you. The ASDA
14 guidelines were done in concert with studies and evaluations
15 that were geared towards looking at oral appliances to make
16 adequate decisions as to how these appliances apply to the
17 various types of conditions that are treated; that is,
18 snoring versus sleep apnea.

19 You can see the indications there as well as I can
20 and these have been discussed with you.

21 [Slide.]

22 ASDA clinical guidelines further go on to talk
23 about medical assessment with polysomnography for moderate
24 and severe sleep apneic patients. Obviously, this is the

1 recommended approach. As we all are aware, recommended
2 approaches don't always have the favorable outcome that we
3 would like.

4 [Slide.]

5 How do they work? Well, oral appliances are worn
6 in the mouth during sleep to prevent the oropharyngeal
7 tissues in the base of the tongue from collapsing and
8 obstructing the oral airway. That is the basic premise from
9 which we are functioning.

10 However, we are beginning to find that there may
11 be some other functions that these devices provide.

12 [Slide.]

13 Oral appliances may function in three basic ways.
14 They may reposition the mandible, tongue and soft palate, as
15 well as the hyoid bone, bringing it forward with the
16 dissociated musculature. They stabilize the mandible,
17 tongue and the hyoid bone and they can increase baseline
18 genioglossus activity.

19 There are various categories that have been
20 discussed. We have discussed mandibular repositioners,
21 tongue retainers or tongue-retaining devices. The last two,
22 soft palatal lifters and tongue posture trainers, are
23 basically not considered any longer. SDDS does not really
24 feel that these particular types or categories of appliances

1 are efficacious in the treatment of snoring and sleep apnea.

2 [Slide.]

3 What do they look like? What do the oral
4 appliances actually look like? This is one type of oral
5 appliance. I thought it would be prudent to bring a few
6 slides that would show you what some of these various
7 devices look like.

8 Many of them are basically splint-like or splint-
9 type appliances. Some look very similar to simple mouth
10 guards or night guards but they are basically designed to
11 advance the mandible.

12 [Slide.]

13 This is one type of appliance that brings the
14 mandible forward. The pieces are not locked together except
15 for a stylus pin which is difficult to see in the midline
16 and allows for some freedom of movement of the jaw.

17 [Slide.]

18 This is another type of appliance that very
19 similarly works by advancing the mandible, allowing the two
20 components some mobility so if the patient is a bruxer, a
21 clencher or has some type of parafunctional activity during
22 the night they can still maintain that activity.

23 [Slide.]

24 This is another view of the same appliance.

1 [Slide.]

2 This is a Herbst appliance. This is a modified
3 orthodontic appliance which has found its way into the sleep
4 area for purposes of mandibular advancement.

5 [Slide.]

6 Another device called the PM positioner. I am
7 running through these very quickly just so you can get a
8 bird's-eye view of what some of the various devices look
9 like.

10 [Slide.]

11 This is the tongue-retaining device. This works
12 differently. In most instances, no repositioning of the
13 mandible but the tongue is placed forward into that bulb you
14 see to the left of the appliance sticking out from the
15 mouth. The patient takes and sticks their tongue into the
16 bulb, presses on the bulb exuding any air that is there and,
17 voila, suction is formed holding the tongue forward.

18 [Slide.]

19 This is another type of mandibular-advancement
20 appliance similar to some of the orthopedic type appliances
21 that have been advocated in orthodontic therapy. This
22 particular one, in fact, was designed by an orthodontist in
23 Honolulu, Hawaii.

24 [Slide.]

1 We see the effectiveness of oral appliances here
2 in terms of apnea index being decreased and RDIs being
3 decreased. This is basically just an average study out of
4 30 research studies that were conducted from 1982 to 1992.
5 You can see that there is a significant reduction from an
6 apnea index of 48.9 down to 22.3 and there is an RDI
7 reduction from 40.5 to 18.7.

8 [Slide.]

9 We do know that they are effective. We know that
10 they are more effective for snoring than they are for sleep
11 apnea. We know that we can get patient's apnea index and
12 respiratory distress index down. We know that they are not
13 totally effective. We know they don't cure the problem.

14 Many devices that are out there for treatment
15 don't really cure the problem. They manage the problem and
16 that is our goal is to improve or enhance the quality of
17 life for the individual for whom we are seeking treatment.

18 [Slide.]

19 This is another study. This is from Alan Lowe's
20 study dealing specifically with the Klearway appliance
21 showing the reduction that has occurred in RDI and apnea
22 index before and after. You can clearly see that there has
23 been improvement. You can also clearly see that there has
24 not been necessarily a cure.

1 [Slide.]

2 Periodic follow up is indicated. It is the
3 recommendation of the Sleep Disorder Dental Society in
4 concert with the American Sleep Disorders Association that
5 there be recurrent medical assessment much as there would be
6 for any of the dental diseases that we treat whether it be
7 periodontal disease or what have you and, of course,
8 reevaluation from a dental point of view.

9 [Slide.]

10 We are very concerned about contraindications that
11 can occur. We know that we don't want to treat patients who
12 already have ongoing systemic problems that could be
13 worsened by the utilization of these devices. Particularly,
14 they are not advocated for patients who have central sleep
15 apnea.

16 Keep in mind, please, that apnea has three
17 different categories. Apnea is made up of obstructive sleep
18 apnea, central apnea and what is called mixed apnea. That
19 hasn't been discussed here that I have heard. It is prudent
20 to understand that mixed apnea is a combination of
21 obstructive and central apnea.

22 Central apnea is the lack of respiratory effort.
23 Appliances are not indicated for that particular type of
24 sleep disorder. So even the patient who snores and has been

1 told that they stop breathing may, in fact, not be an
2 obstructive apneic. They may actually be a central apneic
3 but may not recognize it.

4 Up until recently, I always, when I lecture on
5 this topic, have said, "Well, central apneas are not that
6 frequent." Lo and behold, I am lecturing with a sleep
7 physician from Pueblo, Colorado, last year, out in Pueblo
8 and, don't you know, that he contradicts me because he says
9 that, at high altitudes, they find that they have more
10 central apneics than they actually have obstructive apneics.

11 So there is a consideration that must be given
12 based upon geography and certain other prevailing conditions
13 as well. We know that we must be very cautious about the
14 use of these devices with our TMJ-type patients, with
15 patients who have poor dental status.

16 The issue of denture patients and partially
17 edentulous patients comes up and that requires significant
18 insight and modification of these devices based upon our
19 dental expertise and, of course, the patient who lacks
20 motivation. It takes somebody who is motivated to use these
21 devices, whether it be CPAP or an oral appliance.

22 [Slide.]

23 Common side effects deal with excessive salivation
24 which is usually transient in nature. We know that

1 temporomandibular joint problems can arise with mandibular-
2 positioning devices, with devices that simply open the mouth
3 or alter the occlusion.

4 We know that some patients will complain of a dry
5 mouth, particularly those who are mouth breathers. We know
6 that there may be soft-tissue irritation with some devices.
7 There may be also irritation to the tongue. There may be
8 some bite disharmonies upon removal of the appliance due to
9 the repositioning that is taking place and some of the
10 musculoskeletal input that is there in the mandibular
11 positioning.

12 More uncommon complications deal with significant
13 TMJ discomfort or dysfunction and very permanent occlusal
14 changes. But there have been some reported and they need to
15 be looked at on an ongoing basis. This isn't something that
16 someone puts in their mouth and then walks out the door with
17 and you never see them again.

18 [Slide.]

19 The summary is that oral appliances are highly
20 effective for treatment of snoring and they are variably
21 effective, as Dr. Hendler has pointed out, for the treatment
22 of OSA. What is important is for us, as dentists, and I am
23 talking about the Sleep Disorder Dental Association and what
24 we have as our goals, is for us to help our physician

1 counterparts working in concert with them to ascertain those
2 patients that are going to have the most optimum outcome
3 with the utilization of such a device.

4 [Slide.]

5 This is the mission statement of the Sleep
6 Disorder Dental Society. This was also included within the
7 packet of information that was disseminated to you. In
8 addition, I want to point out that you were also sent a copy
9 of a randomized crossover study dealing with CPAP and oral
10 appliances that was published in the Journal of Chest
11 recently.

12 There are numerous, numerous articles that are all
13 over the literature, mostly in the medical literature, that
14 are well-controlled studies. This is a new area for us.
15 The Sleep Disorder Dental Society was founded in 1990 and we
16 are a small group of dentists who have a vested interest in
17 helping those patients who have this medical disorder.

18 Our goal and mission over the next years and
19 decades as we approach the millennium is to basically have
20 input into this science to help the patients and to provide
21 the most authoritative and complete treatment that we can
22 working in concert with our medical counterparts.

23 I, again, want to point out that, as a member of
24 the SDDS and representing that body, that group--I want to

1 make you aware of the fact that we have, as one of our
2 charges, the establishment of a certification process for
3 not only our members but every dentist that makes these
4 devices, a certification-type process not to say we are
5 specialized, or we are special, or we are certain
6 individuals that have certain credentials, that we have
7 shown sufficient knowledge in the area of both the medical
8 side as well as the oral appliances and dental side, that we
9 have the expertise that is necessary to interface with the
10 sleep physicians, with the physicians who recommend these
11 devices, whether they be internists or otorhinolarygologists
12 of what have you and, in addition, show proficiency in
13 dealing with the problems that can arise with utilization of
14 these devices.

15 I thank you for your attention. I believe that
16 was the last slide.

17 DR. GENCO: Thank you very much, Dr. Bailey.

18 Any comments or questions from the panel?

19 DR. HEFFEZ: You mentioned that there are two
20 appliances. Did you say the palatal lifters and the tongue-
21 retaining devices are no longer considered by your--

22 DR. BAILEY: No; the tongue-modification devices.
23 The devices basically were designed to alter tongue
24 function, some what of a myofunctional appliance. The TRDs

1 and the mandibular-positioning devices, MRDs, are what are
2 considered to be useful.

3 DR. HEFFEZ: But what did you say were no longer
4 considered.

5 DR. BAILEY: When I say "no longer considered,"
6 what I mean is that these are devices that have not shown,
7 by virtue of any types of studies that have been produced,
8 to be effective.

9 DR. HEFFEZ: What are those appliances that you
10 are talking about?

11 DR. BAILEY: Something that is designed simply to
12 lift the soft palate or to keep the soft palate from
13 vibrating.

14 DR. HEFFEZ: So just the palatal lifters? Those
15 are the only appliances the you are no longer considering
16 until obviously studies demonstrate otherwise.

17 DR. BAILEY: Correct.

18 DR. HEFFEZ: Then I had one other question. Does
19 the RDI fluctuate within the same patient or can a person
20 one time be diagnosed as a mild apneic and then another time
21 a severe apneic?

22 DR. BAILEY: That is very plausible. I have to
23 tell you that I am not familiar with all of the studies that
24 deal with this. The problem with trying to ascertain those

1 types of values has to do with it can only be done in terms
2 of a rigid study by polysomnography where you are testing
3 someone, although it doesn't have to be a typical 12 or 16-
4 channel PSG. It can be something of a lesser nature.

5 That is a variable that can occur and, as I
6 indicated, certain seasonal variations, certain times of the
7 year, patients will have alterations. Allergy season, for
8 instance, is one that really comes to mind.

9 But, yes, they can have variability in the amount
10 of apneic events. Also, I think what is important to
11 understand is that where the PSG is done--that is, the
12 polysomnogram--has an important role to play. People are
13 looking more at our home studies, more valid than, say,
14 sleep studies that are done in hospitals where it is more of
15 a foreign environment.

16 There are studies ongoing to take a look at that.
17 June Frye from Philadelphia did a presentation at the last
18 ASDA meeting showing comparison of home studies versus in-
19 house studies or hospital-based studies.

20 DR. HEFFEZ: So if the RDI does, possibly,
21 fluctuate, we have to be careful, then, lumping up all these
22 studies and taking an average of 30 studies and finding what
23 the results are. If the RDI does fluctuate, then it is very
24 hard to know if you have only done one sleep study and you

1 have identified that person to have an RDI of 40 and then
2 tell me that, on the second study, he has an RDI of 20.

3 He may have that RDI of 20 not because of
4 treatment. It may be just a separate event that you only
5 record a 20 at that time.

6 So I think we have to be cautious in interpreting
7 one instrument, looking only, for example, at the RDI to
8 identify that this appliance is functional.

9 DR. BAILEY: That is absolutely correct. However,
10 I have to tell you that the flip side is also possible. The
11 patient may have a sleep study done and find that they have
12 a very low RDI when, in fact, if you were to repeat that
13 with a home study or on subjective findings, find that their
14 RDI does appear to be even worse than what the study
15 actually showed.

16 DR. HEFFEZ: How do you determine, on a subjective
17 way, what the RDI is?

18 DR. BAILEY: I am not saying you can determine the
19 RDI. The only way that you can determine that the patient
20 may actually be worse than what the study showed was that
21 the bed partner relates to frequent arousals, frequent
22 gasping for air and so forth.

23 DR. HEFFEZ: My only point is that, in order to
24 properly interpret the studies, to say that they are very

1 well-controlled studies, I think that you have to tease away
2 these 30 studies that have been lumped together and maybe
3 look at some of those studies that have looked more
4 carefully at the fact that the RDI might fluctuate in order
5 to really accurately determine whether this appliance has
6 been effective or not.

7 DR. BAILEY: I would agree with you.

8 DR. PATTERS: A patient comes to your office with
9 a complaint of snoring. Do you believe the standard of care
10 requires you to refer that patient for polysomnography?

11 DR. BAILEY: If a patient comes to my office and
12 complains of snoring, I ask him about 40 questions
13 associated with that to try to ascertain as to whether or
14 not that patient may, in fact, have some signs of apnea or
15 hypopnea that are going on during the night.

16 After all those questions are asked, then I make a
17 decision as to whether or not that patient may have a simple
18 condition of snoring or basically have some apnea and where
19 the referral should be. I oftentimes then consult with the
20 patient's primary-care physician to determine what their
21 findings may be.

22 It all has to be looked at also in light of some
23 of the other medical conditions that may be present. The
24 same individual walks in who doesn't have the predisposed

1 conditions that oftentimes have been alluded to such as
2 overweight, thick neck, and so forth, and is a thin, normal
3 individual but, yet, complains of incessant snoring, but yet
4 the bed partner only complains of snoring.

5 There is no daytime somnolence. The physician has
6 tested the patient. There are no cardiovascular problems,
7 no hypertension. That may be a condition that would be
8 related as simple snoring and, in concert with the
9 physician, we would address it as such.

10 But I would have to ask other questions, not just
11 the one simple question.

12 DR. PATTERS: My second question; have patients
13 who are edentulous been successfully treated with these oral
14 devices?

15 DR. BAILEY: To this point in time, to my
16 knowledge, there have not been a lot of studies. All the
17 referenced articles have really been more anecdotal in
18 nature, such as, "We had an edentulous patient. We treated
19 him this way."

20 They have had variable success in terms of the
21 treatment of those individuals. They are very, very
22 difficult patients to treat.

23 DR. GENCO: Further questions?

24 DR. STEPHENS: There are a number of mandibular-

1 positioning appliances that we saw. Are there specific
2 indications for one or the other. The second question is do
3 you think that then classifying them, do you think we can
4 put all mandibular-positioning appliances in one group?

5 DR. BAILEY: To answer your first question,
6 basically, they all perform the same function. The only
7 difference between them, if you wanted to subgroup them,
8 would be some are mobile--that is, the upper and lower parts
9 are moveable onto one another and so the patient does have
10 some ability to move the mandible as I cited, for instance,
11 in your bruxing patients.

12 There are other types where the patient is fixed
13 into a position, where they are locked in that position, and
14 there is no mobility whatsoever. But, for the most part,
15 they do the same thing. They bring the mandible forward.
16 That is one group of appliances.

17 I would have to say that, for the most part, they
18 work in sync with one another. They are probably fairly
19 effective one to the other.

20 We have not looked at them--let me put it this
21 way. They have not been looked at completely enough to make
22 a determination as to which one worked better than another
23 based upon the preexisting conditions of the patient. So we
24 don't have an answer to that.

1 I also must point out to you that some of the
2 mandibular-positioning appliances are what are called
3 titratable meaning that you can take and adjust the
4 appliance to vary the amount of mandible repositioning
5 without having to remake the appliance. Once that is fixed,
6 you have got to remake the appliance and that is an awesome
7 task in terms of laboratory fees and so forth.

8 We are looking at these appliances also to derive
9 a code number for CPT coding in the medical profession. We
10 have put a proposal before the AMA and the AMA has come back
11 to use and asked us to categorize them, somewhat to what you
12 are suggesting. And we are now looking at that as how we
13 can best categorized them in the most simplistic manner to
14 derive a CPT code that will be most descriptive for them.

15 The second part--what was your second question?

16 DR. STEPHENS: I think that answers it, but I do
17 have one other question. In terms of determining whether a
18 snorer has obstructive sleep apnea without a sleep study, do
19 you think it is possible to develop a health questionnaire
20 or a clinical way of evaluating it that could be used by all
21 the dentists looking at patients with snoring or sleep apnea
22 to determine whether they are going to use an appliance
23 without a study.

24 DR. BAILEY: At the present time, there are a

1 number of different scales that are used to determine
2 whether or not the snoring patient may have a predilection
3 towards sleep apnea.

4 The one that comes to mind is the Upworth
5 Sleepiness Scale. That particular scale has a series of
6 five simple questions. You answer those questions and,
7 based upon how you respond to them, it points you in the
8 direction that yes, this patient does have a high degree of
9 predilection towards sleep apnea associated with the
10 snoring.

11 But you have to understand that the ASDA's
12 position is, as is the SDDS's, that once you identify those
13 patients who are at risk, and we have to assume that the
14 majority of the snoring patients may not be at risk at this
15 point but may, at some point, eventually be at risk
16 depending upon lifestyle and aging process, that the
17 possibility of them developing apnea along the way is very
18 great.

19 DR. STEPHENS: I thought that the number of
20 snoring patients who may have sleep apnea in some studies
21 approaches 50 percent. Is that correct?

22 DR. BAILEY: There are varying studies out there
23 and I can't cite all the studies that look at the numbers of
24 patients who snore to the number of patients who have apnea.

1 I can report to you as a clinician. As a clinician, I
2 virtually ask every patient I see, "What is your sleep like?
3 Do you snore?"

4 And the number of positive responses I get are
5 awesome. Well over 75 percent of the patient population
6 that I see report snoring, if not every night, at least once
7 or twice a week. Of that number of patients, the majority
8 of them begin to report that yes, they have had occasional
9 episodes of waking up very tired or being tired fully
10 throughout the day and, also, of episodes of trying to catch
11 their breath at night or something associated with an
12 obstructive event.

13 I don't think we know the numbers. That is the
14 key. I think we have an estimate at this point based upon
15 the population that has presented itself with this disorder
16 but the jury is still out and I think it is a long way off
17 before we find out.

18 DR. STEPHENS: I am trying to get a number, the
19 range that we can kind of work with. Is it between 20 and
20 40 percent of snorers that probably have obstructive sleep
21 apnea?

22 DR. GENCO: Dr. Furst, do you want to address that
23 issue?

24 DR. FURST: Just a couple of points. Studies vary

1 in the percentage. I think a good working number we heard
2 earlier is probably about 30 percent, studies say. Some say
3 between 25 and 50 percent. But I just wanted to caution the
4 panel on one very important point and that is that symptoms
5 cannot always predict whether or not a patient is going to
6 have sleep apnea.

7 I have a seven-page questionnaire my patients fill
8 out which gives me very good guidance in terms of who gets
9 sleep studies and who does not, but I can tell you that some
10 patients who are virtually asymptomatic that we have gone
11 ahead and got polysomnography have had severe sleep apnea.

12 Conversely, some patients with severe symptoms, on
13 polysomnography, have upper airway resistance syndrome, or
14 very mild sleep apnea. One has to have a high level of
15 suspicion and, if there is any question at all, I think a
16 sleep study should be done.

17 DR. STEPHENS: I have a worry about using the
18 appliances in the general dental setting without a sleep
19 study.

20 DR. HENDLER: I think your point is well taken. I
21 don't think a questionnaire can make or break the case for
22 sleep apnea.

23 DR. GENCO: I would like to go back to Willie's
24 first question just so we understand this. Dr. Bailey, in

1 your opinion, then this classification of mandibular
2 repositioner into fixed and mobile, there is indication for
3 one or the other? In other words, you did say something,
4 though, that suggests there might be an indication, and that
5 is the mobile would be used in bruxers.

6 DR. BAILEY: As far as the apnea situation goes
7 and where the apnea may be occurring, because it can occur
8 at various areas within the pharyngeal airway, we have no
9 handle on which device would work better than any other
10 device to address particular issues along that line.

11 However, in the dental setting, if I have got a
12 bruxing patient or a patient who has heavy wear on his
13 teeth, maybe has some musculoskeletal symptoms, I may be
14 more inclined to use a device that will allow him to
15 continue to promote that habit without locking him into a
16 set position where he may be fighting that habit all night
17 long and that would destroy his sleep more than help it.

18 DR. GENCO: So there are indications for the fixed
19 and the mobile?

20 DR. BAILEY: Yes. The indication part of it, I
21 was looking at more from the OSA situation as opposed to
22 dental situation.

23 DR. GENCO: But there are indications.

24 DR. BAILEY: That is correct.

1 DR. GENCO: So that, from the panel's point of
2 view, there might be a justification for splitting up the
3 mandibular repositioners and then subgrouping them into
4 mobile and immobile.

5 DR. BAILEY: Correct.

6 DR. HENDLER: There are actually three categories.
7 There are immobile, mobile and adjustable because the mobile
8 components may keep that patient in the fixed relationship
9 that they can change, but they are adjustable appliances
10 where you can actually sequentially move the mandible to
11 different positions. So there are three basic types; fixed,
12 mobile and adjustable.

13 DR. GENCO: Is there an indication for the
14 adjustable?

15 DR. HENDLER: Oh, sure. As the doctor mentioned,
16 when you have a fixed appliance, you set the patient's
17 mandible in a certain position. If that patient, for
18 example, reports not a significant improvement in their
19 condition, then if you use an adjustable appliance, you can
20 adjust the mandible forward or back.

21 You can increase or decrease temporomandibular
22 joint symptoms, for example. So adjustable appliances are
23 used to do just what they say, adjust the patient if they
24 are not responsive to the first position.

1 DR. GENCO: We can get back to that later. Any
2 further questions of Dr. Bailey?

3 MR. LARSON: Just a clarification. In the devices
4 that you have illustrated, are we talking about a mix of
5 manufactured devices and laboratory devices and do we have
6 the situation where we are only concerned with the
7 manufactured devices?

8 DR. GENCO: Good question. What did you show us,
9 custom-made or manufactured.

10 DR. BAILEY: Every single device that I showed you
11 on the screen is custom made. Impressions are taken. A
12 specific bite is taken and they are made by an outside
13 laboratory.

14 DR. GENCO: In your experience, are the
15 manufactured devices similar? Are they mobile, immobile,
16 adjustable?

17 DR. BAILEY: Similar in what regard?

18 DR. GENCO: In the classification. Are there
19 manufactured mandibular repositioners that are mobile,
20 manufactured that are immobile and manufactured that are
21 adjustable?

22 DR. BAILEY: They are all manufactured, I would
23 say, to a high degree of quality and there is not really
24 much of a difference in terms of how they fit. They all are

1 clasped in a certain way. They all have a certain amount of
2 retention associated with them.

3 MR. LARSON: I am talking about premanufacture.

4 DR. BAILEY: Premade appliances that are meant to
5 be taken out of a box and used in the office and sent home
6 with the patient?

7 MR. LARSON: Yes.

8 DR. BAILEY: You are talking about a type of
9 device or appliance that is very rare. These would be like
10 mouth-guard-type appliances that are already on the market.

11 DR. GENCO: That is what we are about here is to
12 classify those that are on the market, not the custom-made.
13 The custom-made are out of the purview of this committee as
14 I understand it.

15 DR. BAILEY: The appliances that are basically
16 out-of-the-box or off-the-shelf, into-the-mouth, type
17 devices may or may not fit as well. There is no control of
18 the amount of opening that is there because they are one-
19 size-fits-all-type phenomena. I don't feel that they offer
20 the same advantages that the custom-made devices do.

21 DR. RUNNER: For the purposes of our
22 classification effort, all the devices that have come
23 through the FDA are not considered custom. That doesn't
24 prevent an individual dentist from formulating their own

1 device specifically for the patient.

2 But once it starts to be distributed in interstate
3 commerce and advertised as such, then it comes through the
4 510(k) process and is not considered "custom," although each
5 patient has an individual mold made for the appliance. So
6 it is custom in that fashion, but not custom device.

7 DR. GENCO: Sandra, do you want to help us clarify
8 that question.

9 DR. SHIRE: Just to clarify; the products that Dr.
10 Bailey showed in his slides were cleared devices, the NAPA
11 device, the Klearway and so on. Those were all customized,
12 chair-side, but those are introduced into market through FDA
13 clearance.

14 DR. GENCO: Thank you. I think we have got that
15 clear now. Further questions? Further questions?

16 Thank you very much, Dr. Bailey.

17 The next presentation will be given by Dr. Stephen
18 Burton and Mr. Robert Hezlep from EPM Systems. By the way,
19 I would like to reiterate a comment from yesterday with
20 respect to all individuals who make statements. Please, in
21 the interest of fairness, disclose any current or previous
22 financial involvement with any firm whose products you wish
23 to comment on or competitors' products, if you have other
24 involvement with competitors' products.

1 Dr. Bailey, I would like to offer you that
2 opportunity, too. I know that you told us that you are
3 president elect, but is there anything you would like to
4 disclose about any arrangement with any company whose
5 products we are discussing or a competitor.

6 DR. BAILEY: No, sir. I have no financial
7 arrangement with any firm or company that manufactures the
8 device.

9 DR. GENCO: Thank you.

10 Sorry about the interruption. Dr. Burton?

11 DR. BURTON: Thank you for your time.

12 [Slide.]

13 I have spent the majority of my life involved in
14 the care of sleep-disorder patients. I have practiced in
15 the field of medicine for almost 20 years. I am board-
16 certified by the American Board of Sleep Medicine. I was a
17 director of a sleep center where I directed the care for
18 thousands of patients who presented with snoring and sleep
19 apnea.

20 I have published dozens of research articles on
21 basic sleep research and clinical sleep disorders. Almost
22 eight years ago, I left my clinical practice and founded EPM
23 Systems, a company that is focussed on making the process of
24 identifying and treating patients more patient-friendly.

1 We have developed an FDA-accepted device for
2 snoring. Yesterday, you were charged to address three
3 important questions. My goal today is to help you
4 understand the importance of dealing with snoring and sleep
5 apnea as related but separate problems.

6 We struggled with those issues even as we began
7 today and we continue to do that. I am conflicted deeply
8 with those issues. I have presented them both as a
9 clinician, as someone who cares about sleep apnea, and as
10 someone who cares about the people who snore. They are
11 different people.

12 Ten to 15 people here snored last night. Three or
13 four of you have some level of sleep apnea but most of you
14 just snore. The vast majority of you just snore. The
15 numbers that we talk about are in the neighborhood of
16 30 percent--some studies are as low as 20 percent--of the
17 people who snore have apnea.

18 The fact is the vast majority just snore. It is
19 an undisputed fact. The reason the studies vary so much is
20 because people have a different definition. If you say
21 someone with 20 apneas per night have apnea, you will find
22 that 40 percent of the people who snore have apnea.

23 But the fact is you would never treat that person.
24 That person will not have surgery. That person will not

1 have a CPAP. So if you functionally look at the issue of
2 how do we define sleep apnea and require us to arbitrarily
3 make a decision of how many events per night make up sleep
4 apnea, that is why you have the variability.

5 But if you look at the people who are treated who
6 snore, it ends up being more in the neighborhood of 20 to 25
7 percent of the people who snore have sleep apnea, if you
8 look at it from a functional point of view of those people
9 who present at the sleep lab, have treatment recommended by
10 their clinician.

11 In the beginning, we used to have a trach. That
12 was our therapy. Those were tough days. Basically, we
13 would tell them to go back and get serious and then will
14 treat you. Try to lose weight. Then we have CPAP. It was
15 a miracle invention when it first came out but we all
16 realize that CPAP has many shortcomings.

17 Surgery is a very effective alternative and it is
18 really the only cure. It is the only thing that actually
19 does stop it and then they can go on. But, unfortunately,
20 it doesn't always work so it is a blessing to have people
21 out continuing to devise new methods.

22 Oral appliances have their place. They are not
23 the end-all. They are not for everyone. They are not even
24 for a majority of people who have apnea. But they are a

1 very big place for the people who snore.

2 The fact is when we restrict the opportunity for
3 relief, we impact more than 50 million Americans. In fact,
4 snoring is a serious problem, just snoring. Today we must
5 think about the millions of Americans who suffer every
6 night, people who cannot sleep with the people they love,
7 people who are embarrassed by a social problem that
8 compromises the quality of their life.

9 We all know somebody like this. Many days, they
10 are the butt of our jokes. Today, they must be the focus of
11 our efforts. My fear is that we throw out the baby with the
12 bath water.

13 In 1974, the Consumer Product Safety Committee
14 came this close to imposing a ban on superglue. In fact,
15 instead, they got together and the industry set up
16 guidelines and the industry worked responsibly with the
17 regulatory agencies to set up cautions and labels and
18 packaging that allowed a product to come into our being that
19 everyone enjoys. In fact, my glasses are held together
20 today by superglue. It is a benefit to all of us and it is
21 a good thing that the industry and the regulatory agencies
22 came together and allowed it to be a product that comes to
23 market.

24 Thank goodness the FDA allowed Breathe Rite to

1 come into being and allow relief for millions of people who
2 snore. That is over-the-counter, available for people who
3 snore and millions of people seek relief. Thank goodness,
4 that is allowed. Heaven forbid they should go to a sleep
5 lab and spend \$3,000 to put on their nasal strip. That was
6 good judgment and I hope that it will continue today.

7 Unfortunately, most people need more than just
8 nasal strips. Nasal strips are not for most people. We
9 know that nasal snoring is not the majority of snorers. The
10 majority of snorers snore because they have an oral problem.
11 Let us allow relief to that group of individuals.

12 Snorers will try anything. If you look on the
13 internet today, there are dozens of things that are
14 recommended; herbs, sunshine therapy, tonics. The fact is,
15 we have a product that has truly proven to provide relief to
16 millions of people who snore.

17 No one argues that mandibular advancement is
18 effective.

19 [Slide.]

20 In fact, in the review that was used to develop
21 the ASDA position paper on oral appliances, Schmidt-Nowarra
22 says, "Snoring is improved and often eliminated in almost
23 all patients who use oral appliances." Snoring. Not apnea.
24 Snoring. Snoring is a major problem. We can do something

1 for them.

2 [Slide.]

3 Dr. Loube was kind enough to present the ASDA
4 position paper yesterday. The part of it that wasn't
5 presented, what I want to mention today, was, in fact, oral
6 appliances are recommended as the first-line therapy for
7 primary snoring. If they snore, and they just snore, the
8 Society's position is, "use an oral appliance."

9 [Slide.]

10 There are many fears and there are many facts that
11 I want to review. One of the fears is that snoring is
12 medical. The reality is, the fact is, there is no data to
13 support a relationship that snoring is medical.

14 [Slide.]

15 Snoring is most often and preponderantly most
16 often just snoring. Snoring alone is not even a reason to
17 have a sleep study. Dozens of studies have reported this.
18 Dozens of them have made that conclusion; if they simply
19 snore and they don't have the sequelae of other symptoms,
20 don't even study them because 80 percent of the time, you
21 will have a negative study.

22 [Slide.]

23 Hoffstein did an impressive clinical review. He
24 cites that, after critically analyzing the data, there is no

1 relationship between hypertension and snoring. It is the
2 apnea. He says it is even difficult to draw any conclusions
3 about snoring about any cardiovascular disease. The fact is
4 snoring can be just snoring and most of the time is.

5 [Slide.]

6 The other fear is silent apnea. Most of the
7 patients that go to Dr. Furst's office seek relief and find
8 relief because, in the skilled surgeon, snoring can be fixed
9 with surgery. Unfortunately, sometimes there are occasions
10 where you will remove the tissue so they can have apnea and
11 they no longer can snore. Silent apnea.

12 The fact is that is not appropriate in oral
13 appliances. We are not removing the tissue. If we fail
14 with an oral appliance, the airway will constrict,
15 turbulence of the airway can occur, and they will snore.
16 There is no such thing as silent apnea with oral appliances.
17 That is a surgical issue because you are removing the
18 tissue.

19 In an oral appliance, the tissue is still there.
20 That is not an issue with oral appliances. Don't let it be.
21 Don't let that confusion enter your mind.

22 [Slide.]

23 The fears that people will not seek treatment.
24 The fact is that in 20 years, we can't get them into the

1 office. We have seen less than 5 percent of the people with
2 apnea. We need to educate the public that there is a
3 serious condition.

4 [Slide.]

5 10 million today have sleep apnea. 10 million.
6 People will debate whether this is 8 million or 12 million.
7 A huge number of people have it. That is as many as people
8 who have diabetes. That is as many as people who have
9 asthma.

10 But no one knows about sleep apnea. No one
11 understands about sleep apnea. It is an issue we must
12 educate the public about. We have an opportunity to do
13 that. If industry works together with the regulatory body,
14 with the medical community, with the dental community, we
15 can educate the public.

16 We can drive people in. In the USA Today last
17 week, 40 percent of the people don't have health insurance
18 today in the United States. They are not going to go into a
19 doctor's office because they snore. Don't make them go into
20 a doctor's office because they snore.

21 [Slide.]

22 What I would like to say--you mentioned, Dr.
23 Stephens, I think, an issue of can we develop a
24 questionnaire that a dentist could use to help them educate

1 on the opportunity of who should they refer because that is
2 an important issue. The fact is I think we can go farther.

3 I think that we can present consumer information
4 that can help the consumer understand. If people know they
5 snore, they don't know they have sleep apnea. If we put
6 them in an opportunity to receive relief from snoring and it
7 fails, then we also give them opportunity to educate them
8 about what are their current options. "Did you know you can
9 see your dentist? Did you know you could go to a doctor?
10 Did you know you could go to an ENT?"

11 Those are opportunities that, if we put them over-
12 the-counter, we can educate and drive these people who are
13 currently driving cement trucks down the road toward you
14 into the doctor's office. Don't miss that opportunity.

15 What I would like to propose is a classification
16 to help you through some of the issues of oral appliances.
17 It is not so complicated, even though there are so many.
18 One of the things I think I would like to see is that we
19 break them by indication.

20 If your claim is apnea, it is a type II device. I
21 think they are all type II devices with the claim of apnea.
22 If the claim is simply snoring, and you are an oral device--
23 we saw some pictures. Here are some to hold and see, an
24 example of an oral appliance which I am talking about which

1 is pre and post, being fit by, for lack of a better word, a
2 consumer.

3 That is the kind of appliance that I think can be
4 a type I device. It is an appliance that does not require
5 the laboratory. It does not require the fabrication--it
6 does not require a physician fitting process.

7 There is also the second level of device which
8 requires laboratory fabrication and that may be a two-piece
9 constructed device. That is a type II device.

10 [Slide.]

11 I also put a few issues for the claims that I
12 thought would be important to educate. There are a few
13 more. I put down a few. "If you are under the present care
14 of a doctor, talk to your doctor." That should be something
15 that is right on the box. "Excessive daytime sleepiness."
16 That is a tough one. That is the symptom that is of most
17 concern to us all.

18 But that is a difficult thing to define.
19 What is excessive daytime sleepiness? Is it that you fall
20 asleep? But just the mention of daytime sleepiness, that is
21 where we are going to have to help with some of the
22 verbiage.

23 Episodes of holding your breath during your sleep,
24 witnessed sleep apnea. That is a frequent thing that people

1 can recognize. If you talk about it, "Well, gee, John, you
2 do do that."

3 High blood pressure. Stroke. Dentures. TMJ.
4 History of TMJ. History of jaw pain. Make it easy for the
5 consumer to understand. Don't give them the acronyms. Let
6 them see it on the box. Let them understand, "These are
7 things that you should think about to consult a doctor.
8 Don't buy it. Talk to your doctor if these are true."

9 [Slide.]

10 The fact is most of the people just snore. Give
11 them an opportunity for relief.

12 Thank you.

13 DR. GENCO: Thank you, Dr. Burton.

14 Any questions or comments of Dr. Burton?

15 DR. HEFFEZ: You made the statement that if people
16 snore, don't send them to the sleep lab unless you have
17 determined that they have--I think I am quoting you--
18 sequelae of other symptoms. That is the term you used.
19 What are the other symptoms that are going to determine that
20 you are going to send a person for a sleep study?

21 DR. BURTON: The biggest one is excessive daytime
22 sleepiness. The other symptoms can be hypertension. The
23 other symptoms can be morning headaches. The other symptoms
24 can be sweating at night when you are sleeping, restless

1 sleeping. Another symptom can be waking yourself from your
2 snore.

3 Those are the types of ancillary symptoms that go
4 with the complex, with the syndrome of the sleep apnea.
5 Those help you be more likely to have a positive test.

6 DR. HEFFEZ: People who snore, are they sleep-
7 deprived?

8 DR. BURTON: Not necessarily; no. Most of time,
9 it is their bed partner.

10 DR. HEFFEZ: So if you are telling me not
11 necessarily, does that mean yes they are or no they aren't.

12 DR. BURTON: If they happen to also have sleep
13 apnea, yes, they are. If they only snore, no, they are not.

14 DR. HEFFEZ: So when one talks about trucks
15 driving into the back of you, if you snore, you are not
16 going to drive a truck into the back of a person because you
17 are not sleep-deprived.

18 DR. BURTON: That is correct. That is absolutely
19 correct. The reality is there was an article in the Chicago
20 Tribune a few months ago that said--one big headline;
21 "snorers are one-third more likely to have accidents." That
22 is the worst thing we can do to those snoring people. They
23 are already totally made fun of.

24 There is no reason to let people think that,

1 because you snore, you can't drive a car. It is because you
2 have apnea. It is not because you snore.

3 DR. HEFFEZ: If no one understands how many people
4 have this disease, how can one give a percentage or estimate
5 of how many people are affected with the disease?

6 DR. BURTON: The only reason there is ambiguity is
7 because we are not looking at all the data in your hand this
8 morning. There is not so much ambiguity. It is not so
9 uncertain of the percentages. If you looked at the data and
10 put all those studies together, the findings are very
11 consistent.

12 The only reason why there is some variability in
13 the actual percentage is because they used a different
14 definition. If you apply the same definition, arbitrarily
15 pick one, 5 apneas per hour, you will find a tremendous
16 consistency across all the studies.

17 The biggest reason for variability is the fact
18 that they used a different definition when they were picking
19 what was called apnea.

20 DR. HEFFEZ: Has a "normal" population ever been
21 studied?

22 DR. BURTON: Yes. In fact, there were large
23 numbers of questionnaires with some number of thousands of
24 people. Actually, Dr. Clark may be familiar with some of

1 those, may remember some of this research. But there is a
2 large number of people that were studied. They were
3 telephone surveyed, Gallop-poll kinds of surveys where they
4 were talking about those issues.

5 DR. HEFFEZ: No; but has anybody been studied with
6 a sleep study, "normal" population in a sleep study?

7 DR. BURTON: Yes; there was a study, many years
8 ago, a study where they took many of those normal people and
9 did just studies to find the incidence in the population.
10 That is where the 3 percent numbers were coming from.

11 DR. HENDLER: Assuming that Dr. Altman is a
12 healthy snorer, when he wakes himself up at night because he
13 is snoring loudly, you are telling me his sleep is not
14 disturbed?

15 DR. BURTON: What I am telling you is that I don't
16 know that he is waking himself up from snoring.

17 DR. HENDLER: He just told us he was.

18 DR. BURTON: That may be his belief. He, in fact,
19 may need to urinate and he just happens to snore. There are
20 many reasons to wake up in the night.

21 DR. ALTMAN: That, too.

22 DR. HENDLER: Well, maybe he wakes himself up and
23 then he urinates.

24 DR. BURTON: Yes; it could be.

1 DR. HENDLER: The other two questions I have for
2 you is how do you address a patient who has a normal palate
3 and uvula but has snoring in the retroglossal tissues due to
4 anterior or posterior or lateral collapse. You are saying
5 that you cannot cause silent apnea with the use of an oral
6 appliance? What data do you have to show that.

7 DR. BURTON: Are you saying that person will or
8 will not snore.

9 DR. HENDLER: I am saying patients who have
10 retroglossal snore who use an oral appliance can have that
11 snore significantly reduced or eliminated and still have
12 apnea. You are saying that silent apnea is only a surgical
13 event because the soft palate is treated. Snoring occurs in
14 two areas, not just the soft palate.

15 Then, the second question--do you want to answer
16 that first?

17 DR. BURTON: I am not sure how I would answer that
18 in a way--I am not sure what the question specifically is.

19 DR. HENDLER: You said silent apnea is only a
20 surgical issue.

21 DR. BURTON: Yes.

22 DR. HENDLER: I am saying that do you have data to
23 show that when patients who have snoring in the retroglossal
24 area that oral appliances don't stop that and create the

1 silent apnea?

2 DR. BURTON: I don't know.

3 DR. HENDLER: Most of our studies show that if a
4 patient doesn't have snoring in the palatal area, they may
5 have it in the retroglossal area and oral appliances
6 actually can mask that sleep apnea and cause silent apneas
7 because the snoring is lower down and not higher up.

8 DR. BURTON: I don't know that incidence of that.

9 DR. HENDLER: The next question is patients who
10 have periodontal disease and loosening teeth and don't know
11 it, how do you prevent them from hurting themselves by
12 putting that thing in their mouth with no indication that
13 their teeth can be further loosened?

14 DR. BURTON: You educate them. That definitely
15 should be a caution on the box.

16 DR. HENDLER: Most people get the diagnosis of
17 periodontal disease by getting dental X-rays as opposed to
18 dental examination. So somebody walks in there--

19 DR. BURTON: But you can probably articulate that.
20 You can articulate that and put that on a package. You can.
21 You can do this just like you articulate it by questions in
22 the dental office.

23 DR. HENDLER: So you put on the package that the
24 patient should see their dentist first?

1 DR. BURTON: Sure. "If you have this concern, see
2 your dentist first. See your doctor first."

3 DR. HENDLER: Suppose the patients don't have that
4 concern?

5 DR. BURTON: Then they make a trial. The symptoms
6 don't occur overnight. The symptoms that you are describing
7 are a process. It takes years in braces to occur teeth
8 movement in the average person. If we have people with
9 disease, then you help them with the symptom picture of what
10 would caution them to use it and you give them symptoms.

11 If you find your bite moving, stop the device.
12 This is not something that is going to happen in one use and
13 then be irrevocably harmed. In fact, they will stop the
14 moment you stop using it.

15 I am not trying to be irresponsible. I am
16 suggesting the opposite. I suggest it is irresponsible to
17 deny 50 million people who just snore the opportunity for
18 relief. I want to be responsible. I want our medical
19 community and our dental community and our industry and our
20 regulatory community to work together to offer relief to a
21 huge body of people who suffer every night. I want to work
22 together responsibly.

23 DR. GENCO: Dr. Clark, do you have comments or
24 questions?

1 DR. CLARK: Hi, Dr. Burton.

2 DR. BURTON: Hi.

3 DR. CLARK: Your claim is that the appliance helps
4 the snoring. Have you actually measured snoring with these
5 appliances?

6 DR. BURTON: Yes.

7 DR. CLARK: How did you measure it?

8 DR. BURTON: The two studies that have happened,
9 and we have more ongoing studies. It is a small n so far.

10 DR. CLARK: Talk about the published work.

11 DR. BURTON: The published work was
12 polysomnography. It was three nights. The first night was
13 an all-night sleep study. The second night was--

14 DR. CLARK: No, no; how did you measure snoring?

15 DR. BURTON: Sound. A microphone hanging in the
16 air and a microphone attached to the neck.

17 DR. CLARK: That is decibel level?

18 DR. BURTON: Yes.

19 DR. CLARK: Where was that published. I guess I
20 hadn't seen that.

21 DR. BURTON: Actually, it is in your handout. It
22 is data that is currently in the process of being published.

23 DR. CLARK: So the published work is what?

24 DR. BURTON: It is unpublished. There is no

1 published study on our particular device.

2 DR. CLARK: Do you know of other devices that have
3 actually measured snoring pre and post?

4 DR. BURTON: I would have to go back through the
5 studies to find out how many of them actually did. I don't
6 know the count.

7 DR. MORGAN: I just have one point of
8 clarification. Are you saying that if you use an oral
9 device and you have obstructive sleep apnea, by just using
10 the oral device, the snoring will not go away?

11 DR. BURTON: No. The fact is that is not true.
12 Sometimes, they will, in fact--if someone has apnea, you
13 will reduce the apnea. You may not cure the apnea
14 completely. But if you still have the apnea, you will still
15 have the snoring in the huge preponderance of times.

16 DR. MORGAN: But, in the small percentage where
17 you reduce the apnea or you reduce the snoring, don't you
18 think the person who had obstructive sleep apnea might not
19 seek further help because they think that their symptoms are
20 cured or better?

21 DR. BURTON: I think that that is something that I
22 struggle with repeatedly. The reality is that person isn't
23 seeking therapy anyway. The reality is that if I put a
24 piece of information in his or her hand to help educate them

1 on the issues, perhaps, I am more likely to have them into
2 the office than if I leave them alone.

3 I don't think I am hurting you by giving you the
4 opportunity to experience an oral appliance. In fact, I
5 think there is a huge likelihood I will resolve your
6 trouble. In addition to that, if I fail, there is much more
7 likelihood that you, after having read through some of the
8 educational materials we include, would be more likely to do
9 something other than just say, "Oh, well."

10 DR. MORGAN: That is true. But I think a lot of
11 times, when you get medicine over-the-counter and there are
12 all those pamphlets with it, most of the time, you take the
13 medicine. If things get better, the pamphlets go in the
14 wastebasket.

15 DR. BURTON: If things get better, that may not be
16 bad.

17 DR. MORGAN: But the problem may not be cured.

18 DR. BURTON: That's correct.

19 DR. MORGAN: The apnea problem may not be cured
20 which is the bigger problem.

21 DR. BURTON: Sure. If it is enough to where they
22 seek relief or should seek relief, hopefully, we held
23 educate on the need.

24 DR. MORGAN: But I think by taking the medical

1 community out of the initial loop, the educational process
2 might go down. And that is my big concern, by putting it in
3 the drug store and saying, "This is something you can
4 purchase," that takes the physicians and the dentists out of
5 the loop of education where it might be the most beneficial.

6 DR. BURTON: I think, in fact, it encourages the
7 opportunity. Look at what happened with Breathe Rite. How
8 many people now understand that obstruction of the nose can
9 relate in snoring? Millions of people more understand that
10 today than they did before Jerry Rice wore it.

11 That is the help that we can work together. I
12 understand your dilemma. I struggle with it as a clinician
13 every day. But I feel that we can work together to where I
14 think--I don't want to exclude the medical. I want medical
15 doctors using it, talking about it. I want to work
16 together.

17 DR. MORGAN: Right. But I think by introducing
18 this to the public as a cure-all, it takes--

19 DR. BURTON: That is irresponsible. I wouldn't do
20 this.

21 DR. MORGAN: It is not from our standpoint. It is
22 from the public's standpoint. They think everything is
23 better; "Yeah; I don't have medical insurance. I don't need
24 to go any further." And then something drastic happens

1 alone the line. That is a lot of confidence in the public
2 to say, "Okay; I am going to read everything on here. Oh,
3 yeah; this looks like this might be something bad. Now I am
4 going to seek treatment."

5 In reality, I don't think that is how it is going
6 to work. I think you need to include the medical community
7 in the initial loop of the diagnosis and then the proper
8 treatment to help not the small problem but maybe what seems
9 to be a larger problem which is the obstructive sleep apnea.

10 DR. SHIRE: I just have a comment. I applaud your
11 interest in working together with the medical community and
12 the industry and the regulatory body. I have a regulatory
13 issue. If we could go back to your grid which describes
14 what you call type I and type II proposals for the
15 classification of the product.

16 [Slide.]

17 The agency has an opportunity to impact on the
18 labeling when the product is in what we call class I and
19 class II, if that is what you are talking about there.

20 DR. BURTON: Yes.

21 DR. SHIRE: We can discuss over-the-counter versus
22 prescription dispensing of the device separately from the
23 classification.

24 DR. BURTON: Correct.

1 DR. SHIRE: So we can say that all the products
2 could be classified into class II and, for certain
3 indication, or for certain labeling, the products could be
4 sold as over-the-counter products. So a suggestion would
5 be, and I am not recommending a classification, but a
6 suggestion as far as the regulatory classification for the
7 product would be class II with over-the-counter or
8 prescription labeling.

9 DR. BURTON: I understand and fully appreciate
10 that that is a position. My belief is that you could make
11 an argument for a class I device.

12 DR. SHIRE: For a class I device, we don't have
13 the opportunity to review your labeling. As you suggest,
14 cautions and indications and so on would be a very important
15 factor and, from what I am hearing from the panel, their
16 opportunity to interject that.

17 DR. BURTON: Sure. It definitely puts more onus
18 on the industry. I agree completely.

19 DR. GENCO: Thank you, Sandra.

20 I would like to pursue that a bit. You are saying
21 that class II is a possibility. Then the discussion would
22 be either over-the-counter or prescription. In either
23 instance, there would be ability to influence the labeling.

24 DR. SHIRE: That's correct. Class II devices are

1 subject to special controls which include labeling as one
2 special control, registries, post-market surveillance and so
3 on.

4 DR. GENCO: Thank you.

5 DR. ALTMAN: I need to correct the record. I said
6 I was a healthy 40-year-old man. I am pushing it. I am a
7 health 39-year-old man. My question involves compliance. I
8 think my concern here is that it is difficult enough for a
9 physician or a dentist to make a custom appliance and get
10 the patient to comply.

11 My concern is that an appliance that is not custom
12 fitted could be a waste to the consumer that is going out
13 and thinking they are going to buy a snoring device and they
14 don't fit. They try it for a couple a nights and they throw
15 it away. A waste of money and, of course, no effect.

16 Do you have any sort of data on compliance?

17 DR. BURTON: I know that the biggest compliance is
18 a wife. In fact, since this is an FDA-approved product--it
19 is sold through the medical community today; thousands of
20 them are fitted in the doctor's office. So we have had the
21 opportunity to follow up with hundreds of people and talk to
22 them about those issues.

23 Three things seem to impact compliance
24 tremendously. One of them is the ability to move. So the

1 fixed appliance--I am not sure that there is an indication
2 need to separate them. The reality is patient compliance
3 and effectiveness will self-eliminate that from the market
4 eventually because the fact is there is no compliance over a
5 long term of a product that fixes you.

6 You need to brux, even the normal person. So
7 there is going to be a compliance issue that will regulate
8 that for you.

9 In terms of the question of compliance data. We
10 don't have enough history to have exact figures on
11 compliance data. But I do know for when it is effective,
12 the compliance is brought about by--we have 100 sales people
13 of which probably ten of them are now sleeping with their
14 wife again and she won't let him in the room if he is not
15 wearing it.

16 DR. ALTMAN: So your data is anecdotal.

17 DR. BURTON: Yes; today.

18 DR. ALTMAN: Is there a price range that we are
19 talking about, an over-the-counter snore device?

20 DR. BURTON: Pricing?

21 DR. ALTMAN: Yes.

22 DR. BURTON: \$49.95 is what we would imagine a
23 price label to be. That, basically, would include a video,
24 an education pamphlet, also a money-back guarantee of 30

1 days. Those are the kinds of things that we be required by
2 the consumer industry today.

3 DR. HEFFEZ: What percentage of children snore?
4 What percentage of children have sleep apnea?

5 DR. BURTON: I don't know the numbers as well as I
6 used to ten years ago. There is no data that I have ever
7 seen or recall which suggests that the relationship between
8 snoring and sleep apnea is any different in children and
9 adults but I do know that, by and large, snoring children
10 are much more readily treated surgically.

11 Most of the time today they are treated
12 surgically, and successfully.

13 DR. FURST: I can address that issue. I see
14 children every day referred for snoring. Many of them are
15 because of hypertrophic tonsils. Most of those kids will
16 grow out of snoring without surgery and I never recommend
17 surgery for just that indication.

18 Sleep apnea in children is very rare. Significant
19 sleep apnea in children is very rare. The classic
20 Pickwickian syndrome we see in fat, chubby kids, sometimes,
21 we will occasionally get polysomnograms. But snoring is
22 very common. Sleep apnea is very rare amongst kids.

23 DR. HEFFEZ: So then I have a question for the FDA
24 from a regulatory point of view. Can a class I device say

1 not for use in children? Is that a label?

2 DR. SHIRE: I would call on Heather Rosecrans.

3 DR. GENCO: I am wondering. We will have an open
4 panel discussion and go into this in some detail. Perhaps
5 we can defer that kind of issue. What we should really do
6 is take the advantage of Dr. Burton here. Are there any
7 questions relevant to him or his presentation?

8 DR. CLARK: Dr. Burton, I had one last question
9 for you. One of my concerns with dental appliances is that
10 if you use the appliance for years and, maybe in less time
11 if you have periodontal disease, there is tooth movement.
12 Do you know of any following study where actual tooth
13 movement has been measured pre- and post-appliance over a
14 period of time by dental casts or X-rays or some other
15 process?

16 DR. BURTON: I, personally, know of no study today
17 that has done sufficient follow up where you could make a
18 statement for certainty.

19 DR. CLARK: Most people have used the appliances
20 also less than ten years with the vast majority being
21 substantially less than ten years.

22 DR. BURTON: Yes. I do know that it is a process
23 that takes time to occur. With proper education, you would
24 be able to minimize that as a side effect.

1 DR. GENCO: Any further comments or questions of
2 Dr. Burton? If not, I would like to thank you very much.

3 DR. BURTON: Thank you for your time.

4 DR. GENCO: We would like now to proceed to Mr.
5 Gary Meade and Mr. Stephen Brown representing DISTAR,
6 Incorporated.

7 MR. MEADE: Mr. Chairman, members of the panel,
8 good morning. My name is Gary Meade. I am, unlike the
9 other speakers today, not a doctor or a dentist. My father
10 is a dentist. His name is Tom Meade. He is an inventor of
11 a couple of different oral appliances which have been used
12 for snoring and for sleep apnea.

13 Dr. Meade's involvement in this area began 12
14 years ago in 1985 in conjunction with Dr. Wolfgang Schmidt-
15 Nowarra whose name has come up a couple of times. At that
16 time, Dr. Schmidt-Nowarra was associated with the University
17 of New Mexico.

18 Based on my father's consultations with Dr.
19 Schmidt-Nowarra, he began developing an oral appliance, the
20 first of which he fit in the spring of 1986. These initial
21 appliances were custom fabricated and were evaluated by Dr.
22 Schmidt-Nowarra.

23 Over a period of time, my father, in conjunction
24 with an orthopedic surgeon, developed an oral appliance now

1 known as the Snore Guard. This and subsequent appliances
2 developed by Dr. Meade, specifically one called the
3 TheraSnore and a new one known as the Adjustable TheraSnore,
4 are prefabricated.

5 They have a hard plastic shell with a soft thermal
6 plastic lining which allows these appliances to be softened
7 chair-side and fit chair-side literally in a matter of
8 minutes. This eliminates, of course, having to take molds
9 of the teeth, having to send things off for expensive lab
10 work. It reduces the cost and makes these appliances much
11 more easily available to both dentists and, subsequently, to
12 patients.

13 Now, over the period of these 12 years, Dr. Meade
14 has had direct patient experience of fitting about 1500
15 people with these appliances, 1500 patients, I should say.
16 In the course of promoting these appliances through DISTAR,
17 he has traveled around the country, around the world, and
18 has fit another probably 1500 or more dentists and other
19 professionals with appliances for their own personal
20 evaluation.

21 So that gives him a tremendous fund of personal
22 experience with these appliances. Beyond that, DISTAR has
23 sold, between the Snore Guard and the TheraSnore models, in
24 excess of 50,000 of these units primarily to dentists, some

1 to physicians as well as to sleep centers.

2 This does not result in, as I am sure you have
3 gathered, tremendous clinical data but rather in tremendous
4 anecdotal data. The conclusions that we have reached from
5 our direct experiences and from our indirect experiences
6 with these specific appliances--and just so I am clear on
7 this, these are mandibular-positioning appliances. Although
8 the TheraSnore appliance does not require moving the
9 mandible into a protrusive position, as many of them do, it
10 will allow that if that is what is required.

11 So when we use the term "mandibular repositioner,"
12 that is not always entirely accurate, at least not with
13 respect to the TheraSnore and adjustable TheraSnore
14 appliances.

15 But we have come to two conclusions through the
16 use of these appliances. One is, in 50,000 units, we are
17 not aware of any long-term harm or other serious adverse
18 consequences of the use of these appliances. Now, that is
19 not to say that we don't see some minor side effects as has
20 been reported here before and as has been reported in some
21 of the literature.

22 These side effects include the obvious. What if
23 the jaw is sore? What if the teeth or the gums or other
24 soft tissues are sore or the patient experiences any kind of

1 pain? We instruct our patients and we ask our dentists to
2 instruct our patients, and we include an insert with our
3 appliances, that says two things if you experience any
4 problems.

5 Number one; take the appliance out. Number two;
6 go back, see your provider, see your dentist or your
7 physician, so we can adjust it. These particular appliances
8 are very easy to adjust so that patients can be comfortable
9 in them. This, of course, is going to improve long-term
10 compliance--short-term and long-term compliance.

11 So that is our first conclusion. These appliances
12 are safe. The other conclusion, and you have heard this
13 time and time again from physicians and from dentists both,
14 is that oral appliances, in particular mandibular-
15 positioning appliances like the Snore Guard and the
16 TheraSnore, are very effective in the treatment of snoring.

17 They are very effective. They are, admittedly,
18 somewhat less effective in the treatment of sleep apnea,
19 particularly the more severe forms of sleep apnea. But, as
20 you have heard time and time again over the last day or so,
21 they are effective and they are an appropriate treatment
22 alternative for, particularly, mild and moderate sleep
23 apnea.

24 As a result of all of our information and of all

1 of our experience, we know that these appliances are, as I
2 have mentioned, safe and they are effective. As a result,
3 it is the position of DISTAR, Incorporated, a company formed
4 by my father to distribute and manufacture these appliances,
5 that these appliances do not require any kind of special
6 controls.

7 I don't want to take too much of your time but I
8 would like to reiterate what Dr. Burton said, and that is
9 when you look at a nation of 50 million people who snore
10 many of whom are never going to submit to a sleep study
11 either because their insurance doesn't provide for it or
12 they are not willing to pay for it or they just don't want
13 to put up with it, to deny them any kind of relief for their
14 snoring, relief for both them and, in particular, their bed
15 partner, is, quite frankly, almost unconscionable.

16 It is unimaginable that we would say that you
17 can't do that. As to the concern that oral appliances can
18 treat snoring, can reduce or even eliminate snoring, while
19 not affecting any possible underlying sleep apnea, in our
20 experience, this is extremely rare.

21 It has also been our experience and, again,
22 admittedly, this is anecdotal and it is very subjective, but
23 our experience has been that for patients who do not see
24 relief from sleep apnea, and we take great efforts to

1 educate them on the consequences of sleep apnea, in
2 particular, the subjective signs of that; daytime
3 sleepiness, headaches in the morning and so forth.

4 We find that patients that don't get relief from
5 the sleep apnea don't feel any better and they let us know
6 this. Even if there are a few who get relief from snoring
7 but retain other subjective symptoms that might indicate
8 sleep apnea, even if they don't tell us that, we are talking
9 about an extremely small minority of people.

10 On behalf of the 50 million people who do snore
11 and who can find relief through the use of oral appliances
12 like the TheraSnore or the Snore Guard or some of the others
13 that you have either seen in person or seen up on your
14 screen, it is our recommendation that this panel--it is our
15 hope that this panel would recommend to the FDA that these
16 appliances be allowed to be distributed with minimal
17 controls, with general controls, so that people can have as
18 much access to these appliances as possible.

19 When I got here yesterday, I saw the agenda which
20 listed the various questions and considerations that this
21 panel has been asked to consider. I have not specifically
22 addressed those although, if you would like me to, I would
23 certainly be glad to do so.

24 But without taking any more of your time, let me

1 simply conclude by pointing out again that in our experience
2 with tens of thousands of these appliances, these appliances
3 have proven themselves to be safe. They don't cause any
4 problems. They are effective and, therefore, we recommend
5 that, together, as both industry and as a regulatory
6 body, we work to make these appliances as available as
7 possible.

8 Thank you very much for your time.

9 DR. GENCO: Thank you very much, Mr. Meade.

10 Before you leave, I am sure there are questions.

11 I have a question. You bring to mind the issue of
12 risk/benefit. I would like to present this to you first and
13 then maybe we can have others address this. With respect to
14 silent apnea, it appears to me that an intraoral device could
15 reduce snoring in a patient who has apnea, so you have a
16 temporary silent apnea while they are wearing it.

17 They take it out and they start snoring again,
18 they still have apnea. So it is no longer silent apnea. If
19 you had surgery, of course, possibly the snoring would be
20 cured but the apnea wouldn't be. So that would be more or
21 less a permanent silent apnea.

22 With that issue in mind, so the transient or
23 temporary silent apnea is brought about by intraoral
24 devices, as a risk, what is the problem with that? I ask

1 that question.

2 Secondly, the device for reducing snoring, we have
3 heard that something like maybe 20 percent of snorers also
4 have occlusive apnea, sleep apnea. Some of those would be
5 treated by these intraoral devices. So there is a benefit.
6 So risk is a temporary or transient silent apnea and the
7 benefit is treating a few of those, whatever percentage--
8 maybe you could have that figure for us--who do snore and
9 have apnea actually making their mild to moderate apnea
10 better.

11 So there seems to be a risk/benefit analysis which
12 we are being asked to address. Would you comment to that?

13 MR. MEADE: I would be glad to comment on that.
14 In terms of the transient risk, it is interesting that you
15 put it in those terms. It is transient in the sense that,
16 unlike surgery, these appliances are more akin to
17 eyeglasses.

18 If I put on a pair of eyeglasses and they work,
19 fine. If they don't work or make my head hurt, I take them
20 off and I am back to where I started. That is the same
21 thing that is true with these oral appliances.

22 At least in our experience and in our study of the
23 literature, it is our understanding that a very small
24 percentage, like 1 to possibly 2 percent--in fact, I

1 wouldn't even say 2 percent--1 percent or less of the people
2 that we are aware of who see a resolution of snoring also
3 continue to suffer apneic events. So it is a very small
4 percentage in terms of that risk that you run.

5 In terms of the other benefit, other speakers have
6 said this more eloquently than I probably can but, as you
7 alluded to, the idea is that, by treating the snoring, for
8 some of those people who also have sleep apnea, we are also
9 going to be offering some relief for that.

10 What that percentage is, I can't tell you, but
11 there is a disparity between the success and the treatment
12 of snoring and the success and the treatment of sleep apnea
13 and those results vary depending on what study you look at.

14 But, as other speakers have indicated, the fact is
15 that you are offering some relief for those sufferers with
16 sleep apnea who otherwise would receive no relief at all.
17 So there is a benefit there that is absent and without the
18 use of any kind of oral appliances for many of these people.

19 DR. GENCO: Thank you.

20 Any comments or questions from the panel or the
21 guests?

22 DR. STEPHENS: Are you recommending this device be
23 labeled for snoring only or is the recommendation for
24 snoring and some forms of sleep apneas?

1 MR. MEADE: Let me clarify the question. Are you
2 talking in terms of prescription use or over-the-counter.

3 DR. STEPHENS: Your device.

4 MR. MEADE: We tell our dentists and the people
5 that we provide the device to, which, of course, is now
6 available only by prescription--in other words, it has to
7 come from a dentist or a physician--we tell them that it can
8 be useful in the treatment of both snoring and sleep apnea.

9 Now, for over-the-counter distribution, I don't
10 know that we would want to say that.

11 DR. STEPHENS: But your device is only by
12 prescription.

13 MR. MEADE: Right. There is no oral appliance
14 that is allowed to be sold over-the-counter for the
15 treatment of snoring and sleep apnea at this time. There
16 may be some that have done so anyway, but, in terms of our
17 approval process and the other oral appliances with which we
18 are familiar, none of those are available except by
19 prescription.

20 MR. LARSON: In your cover letter, you recommended
21 class I over-the-counter. Let's go back to the labeling for
22 just a moment. If it were, let's say, class II over-the-
23 counter, you would not label it for sleep apnea?

24 MR. MEADE: I wish I could answer that for you.

1 That is one of those questions--I wish my father were here
2 as the dentist because I am sure he could probably answer
3 that more accurately. I honestly don't know. I am not
4 familiar enough with what our plans and goals are for
5 potential over-the-counter marketing to answer that.

6 I think that trying to market something over-the-
7 counter, and I am speaking purely off the top of my head,
8 here--trying to say something is going to be for sleep apnea
9 and you are putting it on a drugstore shelf, A, that is not
10 going to mean much to most people and B, as other speakers
11 have already attested, sleep apnea--you can find subjective
12 indications of that but the only way to really determine
13 that is through polysomnography and other tests that are not
14 available in the over-the-counter market.

15 So I think it would be difficult to say something
16 is for sleep apnea and take it over-the-counter at the same
17 time.

18 DR. GENCO: The issue of self-diagnosis there
19 would be the problem.

20 MR. MEADE: Exactly. That would be my concern as
21 well, and I would assume that would be my father's. I am
22 speaking on his behalf.

23 DR. GENCO: Further comments or questions?

24 DR. HENDLER: You are looking for over-the-counter

1 distribution; right?

2 MR. MEADE: Ultimately, we would love to be able
3 to go over-the-counter. We feel these appliances, because
4 they can be literally boiled and seated in the mouth, that,
5 with appropriate instructions, with appropriate labeling, we
6 feel that most lay persons can fit these appliances to
7 themselves.

8 DR. HENDLER: You talk about relatively few side
9 effects, et cetera.

10 MR. MEADE: Yes.

11 DR. HENDLER: Obviously, you feel that the
12 industry has responsibility to public safety to get the
13 message out for how these things should be used properly.

14 MR. MEADE: Definitely.

15 DR. HENDLER: How many people did you say you have
16 treated with this appliance?

17 MR. MEADE: We have sold in excess of 50,000 of
18 these appliances, primarily to dentists.

19 DR. HENDLER: Do you know how many published
20 articles there are about the Snore Guard in the entire
21 medical literature?

22 MR. MEADE: In the entire medical literature? I
23 wouldn't even hazard a guess.

24 DR. HENDLER: I think there have been less than 90

1 patients that have been studied.

2 MR. MEADE: I know there was one study with 68
3 patients.

4 DR. HENDLER: I think the total is less than 100.

5 MR. MEADE: That may be. I don't know, sir.

6 DR. HENDLER: And you have treated 50,000.

7 MR. MEADE: We have provided 50,000 of these
8 units; yes--which is why I say that most of our data, most
9 of our conclusions, are drawn from anecdotal evidence
10 because that has been the bulk of our experience.

11 DR. HENDLER: Obviously.

12 DR. GENCO: There is a requirement for someone to
13 report adverse effects. Could you expand on what that
14 requirement is? What have you been required to do through
15 your 510(k) and with the FDA in terms of adverse effects?

16 MR. MEADE: In terms of the 510(k) process, I am
17 going to turn that over to Stephen Brown who is more
18 familiar with this process.

19 DR. GENCO: What is your experience? I think we
20 might get to Dr. Hendler's question of safety through a
21 reported post-market adverse events and what is the rigor
22 with which those are reported.

23 MR. BROWN: My name is Stephen Brown. I am
24 counsel to DISTAR. The requirement is to report adverse

1 incidents to the FDA.

2 DR. GENCO: That is, if the patient or the dentist
3 or the physician calls you, you must report.

4 MR. BROWN: Yes. And we have not had to make any
5 such report in the five years since the approval of the
6 510(k).

7 DR. GENCO: You have no reports from dentists or
8 physicians or the prescribing clinicians of 50,000 or from
9 the patients who have your phone number someplace, and 800
10 number they can call.

11 MR. BROWN: That is correct.

12 DR. GENCO: Thank you.

13 DR. CLARK: I would like to ask the same questions
14 I asked of Dr. Burton. Are you aware of any study where
15 snoring has actually been measured pre and post, not by
16 questionnaire but by physical measurement.

17 MR. MEADE: I have to admit I am not as familiar
18 with those studies. There may well be but I don't know.

19 DR. CLARK: Do you know of any study where tooth
20 movement has been measured pre and post?

21 MR. MEADE: Not that I am aware of. It is
22 understood, and we have seen in our experience, that tooth
23 movement may occasionally occur.

24 DR. CLARK: If it did occur, what would be the

1 result? If you threw the appliance away at that point, do
2 you think it would go back?

3 MR. MEADE: That I don't know. As I said, I am
4 not a dentist. That is a great question and I wish I could
5 answer it for you, sir. I honestly don't know.

6 DR. GENCO: Thank you. Are there any further
7 comments or questions?

8 DR. ALTMAN: My question is for Dr. Clark. Have
9 you, in fact, done that same measurement with your custom-
10 made snoring devices?

11 DR. CLARK: Snoring is a very difficult thing to
12 measure because you need a fixed microphone which has been
13 attached to the patient and is not a standard in the sleep
14 lab. If your claim is to treat snoring, it ought to be
15 measured. It is technically possible. It has just not been
16 done. There is no real data that I am aware of in use of
17 the appliances with a fixed-measurement device for snoring
18 decibel level.

19 DR. ALTMAN: And tooth movement as well?

20 DR. CLARK: Tooth movement is underreported. I
21 see it frequently because I have got about ten years of
22 experience treating patients. I see it regularly and it is
23 not reversible and patients aren't aware of it. So I am
24 concerned about it. But there is nothing in the literature

1 describing it because you hope those patients go away.

2 DR. ALTMAN: So we had three presentations by
3 professional societies who do their assessments and decide
4 if it is not sleep apnea, then they treat them for snoring.
5 I guess my question to you is how is that any different than
6 buying a prefabricated one? You are asking them for data
7 saying that their prefabricated ones treat snoring. How is
8 that any different from the ones that you have custom made?

9 DR. CLARK: Generally, I think the appliance has
10 too much risk. I use it for sleep apnea. I don't use it
11 for snoring.

12 DR. REKOW: There is a great deal of literature in
13 the orthodontic literature about tooth movement with similar
14 appliance. The mandibular repositioning is similar to what
15 you see in an activator where, with children, your primary
16 objective is to reposition the mandible forward to get some
17 remodeling, to get some growth and take care of some AP
18 corrections in orthodontics.

19
20 But, with those, there are very grave concerns
21 about flaring of the lower anteriors in particular. I would
22 have concern with adults who have a higher probability of
23 perio disease with flaring. If you have little buckle bone
24 to begin with, you could very easily do some significant

1 irreversible stripping of the bone and you could get some
2 flaring that may or may not be reversible.

3 I would be more concerned with the quality of the
4 buckle plate over the lower anteriors. That is not going to
5 be true for all of the devices we have seen. It will
6 certainly be true for those that don't restrain the position
7 of the lower incisors. So if you just have the kind that
8 has the mandibular redirection that pulls the mandible
9 forward without any constraint on the mandibular teeth, that
10 is more likely to occur.

11 I don't know that there is good literature on if
12 you have a soft material and you are repositioning the
13 mandible, then you have got a force-balance question that I
14 don't remember seeing in the literature.

15 DR. GENCO: I think it is an excellent point.
16 Maybe you have something to say about that. We will have a
17 discussion among ourselves and the guests later.

18 MR. MEADE: If I may direct myself to that. The
19 Snore Guard appliance that was our original appliance and
20 which we still distribute to a much, much, lesser degree,
21 does use a ramp which does draw or guide the jaw into a
22 protrusive position. We have seen more flaring of the lower
23 anterior teeth with that.

24 The TheraSnore appliances offer greater support

1 for the mandible. They don't lock the mandible in any fixed
2 position. We have found that that makes it much more
3 comfortable to wear if the user is free to move their jaw
4 around while they sleep.

5 But we find that, by offering greater support,
6 that we see flaring in less than 1 percent of the patients
7 so far that we have had direct experience with. So, while
8 it continues as a minor concern, it is a very minor concern,
9 particularly with our newer appliances.

10 I can't speak to the other appliances that we have
11 heard about yesterday or today. But, as to the newer
12 appliances that we offer, it is very seldom a problem.

13 DR. REKOW: How can you say it is less than
14 1 percent when I think that I heard that you said you don't
15 have any data and you haven't measured it? I am a little
16 confused by that.

17 MR. MEADE: That is, admittedly, anecdotal. It is
18 based on our experiences that we see that very, very seldom.
19 I don't mean to offer that as a hard number, by any means.

20 DR. GENCO: You have two sets of experiences. One
21 is your father's 3,000 cases.

22 MR. MEADE: Right.

23 DR. GENCO: And the other is your 50,000 cases
24 with reported. So you are talking about the 3,000 cases?

1 MR. MEADE: I am just talking about the 3,000
2 cases that we have dealt with.

3 DR. GENCO: And many of those were with Snore
4 Guard? Most?

5 MR. MEADE: Probably about half and half at this
6 point. Just to be perfectly clear, of those 3,000, about
7 half of those were with professionals and dentists that we
8 have fitted in various shows, trade shows, around the
9 country and we may have heard from again. But, certainly,
10 we weren't able to do follow-up visits with them like we are
11 with our own patients.

12 DR. GENCO: So you heard from some of them. You
13 are just estimating ballpark figures.

14 MR. MEADE: Sure. Most of it is based on
15 experience with our patients.

16 DR. GENCO: You have heard about this problem of
17 lower anterior flaring.

18 MR. MEADE: Oh, sure. And we have seen it in our
19 own patients. When we talk about studies that look at 50 or
20 60 people, we have seen 1500 patients. So it is anecdotal,
21 but it does offer a pretty broad range of experience
22 nonetheless.

23 DR. GENCO: Further comments or questions?

24 I would like to suggest that we take about a ten-

1 minute break. Let's get back. We have got quite a bit to
2 do this morning.

3 [Break.]

4 DR. GENCO: We have another individual who has
5 requested time for a formal presentation. We have allowed
6 that. That is Mr. Robert Plezia. Mr. Plezia is from the
7 Great Lakes Orthodontics Limited Company. He would like to
8 make some comments with respect to these devices.

9 Mr. Plezia.

10 MR. PLEZIA: Thank you, Mr. Chairman, panel, FDA
11 representatives. My name is Bob Plezia. I am the manager
12 of Business Development for Great Lakes Orthodontics. Great
13 Lakes is NESUB company so I am a shareholder. I have been
14 with them for over eight years, two years of which was as
15 project manager for sleep and snoring appliances.

16 Great Lakes is over 30 years old. We have three
17 divisions. The one most pertinent is the division that
18 fabricates oral appliances. Although we fabricate primarily
19 orthodontic appliances, we have fabricated tens of thousands
20 of splints, primarily for TMJ. We have also fabricated
21 thousands of appliances for snoring and obstructive sleep
22 apnea.

23 We did have a license for the soft-palate lifter
24 at one time. We do have a tongue-retaining device that we

1 market and we market five mandibular-repositioning
2 appliances at this time.

3 Over this time, we have become acquainted with Dr.
4 Alan Lowe. Dr. Lowe has been mentioned here. Dr. Lowe is
5 an orthodontist diplomate, Ph.D.. He is a professor of
6 orthodontics at the Department of Oral Health Sciences at
7 the University of British Columbia in Vancouver. He also
8 has a private orthodontic practice and he also runs a sleep
9 lab at the University.

10 He is one of the cofounders of the Society of
11 Dental Sleep Disorders. He is a member of the American
12 Sleep Disorders Association. We have worked with Dr. Lowe
13 for over seven years.

14 Great Lakes has an exclusive license with Dr. Lowe
15 for his appliance, the Klearway, which he developed. We pay
16 a royalty to the University of British Columbia of which Dr.
17 Lowe is a faculty member, as I mentioned.

18 Dr. Lowe is an authority on oral appliances for
19 sleep apnea. He is an author of many articles. He is an
20 author of a number of chapters in sleep texts. He has
21 lectured around the world on this subject including at the
22 annual meetings of the American Association of
23 Orthodontists, the American Dental Association, the
24 American Sleep Disorders Association, et cetera.

1 He has done extensive clinical studies on oral
2 appliances. Therefore, we consider him an expert on
3 appliances.

4 I spoke with Dr. Lowe in the last day regarding
5 the three questions that the panel has been charged with and
6 asked him for his comments. I would like to reflect them to
7 you.

8 The first question regarding classification, he
9 would recommend that the three categories be separate; in
10 other words, that the mandibular-repositioning appliance is
11 very different from the tongue-retaining devices which are
12 very different from the palatal-lifting devices.

13 He went on to say that one mandibular-
14 repositioning appliance is not like another mandibular-
15 repositioning appliance. When we are talking about creating
16 one millimeter of additional airway space which could mean
17 the difference of a significant change in our RDI, that
18 would result in the appliance moving laterally or AP
19 position or in opening.

20 He would suggest that each appliance, even if it
21 is another mandibular-repositioning appliance, supply the
22 studies that show its effectiveness. I will go into a
23 little more detail. He did mention one mandibular
24 repositioner that has been approved because it was

1 classified as a mandibular-repositioning appliance but it
2 had no data behind it.

3 In terms of question no. 2, one or two pieces. It
4 is his experience that where there are no breathing holes or
5 spaces, that the patient will not wear the appliance. It is
6 his experience that no appliances work on denture wearers.
7 Those that are edentulous in the maxilla, depending on the
8 upper ridge, and have six to eight teeth in the lower, it
9 will work. If there are no teeth in the lower, his
10 experience is that the appliance does not work, any
11 appliance.

12 In terms of over-the-counter devices, he believes
13 that unless there is clinical data behind it, that they are
14 dangerous in terms of safety and effectiveness. In terms of
15 contraindications or labeling which will result in
16 effectiveness and standards, which I will address in a
17 moment, someone with previous TMJ problems, this may be
18 contraindicated. Someone with perio, obviously, it is
19 contraindicated. And, as just mentioned, edentulous.

20 In terms of the dentition that is being used, he
21 would recommend that the appliances have full coverage or
22 there is a chance of supereruption. The side effects;
23 obviously, there is extra saliva that is usually initially
24 only, as with most oral appliances. At times, teeth hurt.

1 Our experience is a lot of times it is because of a poor fit
2 or a perio problem. And I mentioned supereruption.

3 In terms of the third question, Dr. Lowe would
4 suggest clinical data for all appliances submitted,
5 randomized clinical trials with two groups, one with the
6 oral appliance involved and one with some other, whether it
7 is a placebo or CPAP or another oral appliance.

8 These tests would include pre and post in-hospital
9 polysomnographs, some type of compliance data and a quality-
10 of-life assessment, some type of design questionnaire.

11 There were a couple of other subjects that came up
12 we thought we would address regarding oxygen desaturation;
13 the question of CPAP and oral appliances is a valid
14 question. Obviously, with CPAP, you have got forced air
15 going into the lungs. The recovery is going to be pretty
16 significant.

17 In the oral appliances, you don't have that air
18 being blown in. If you are into the high 70 or 80 percent,
19 it is very difficult to get the patient back over 90 with an
20 oral appliance. However, the problem with CPAP, Dr. Lowe's
21 study showed that in three months, 50 percent don't use and
22 those numbers drop after that. There have been some
23 anecdotal reports that show it is less than 50 percent.

24 The other important question regarding not only

1 CPAP but oral appliances is compliance, how long is the
2 patient wearing it. We are working with Dr. Lowe with the
3 monitoring device. A very preliminary, very recent study,
4 shows that with his device, it was worn 6.8 hours a night.

5 His definitions, in terms of RDI; mild is 5 to 15,
6 moderate 15 to 30, severe over 30. I will give you, Mr.
7 Chairman, the study that I brought along that Dr. Lowe has
8 just concluded. On of the studies--he has got a number of
9 the studies--this one, for an example, is 38 OSA patients
10 from Vancouver, London and Calgary. He is on multiple
11 sites.

12 The mean RDI before there was 32.6. After
13 insertion of the Klearway, using the clinical parameters
14 that I mentioned, it was reduced to 12.1. And then he goes
15 into breakdowns of that; reduced to less than 15 an hour in
16 80 percent of the moderate group, 61 percent of the severe
17 group.

18 My point is there are a lot of clinical studies
19 that have been published. I also have a bibliography that
20 we have and we present to dentists that want to know more
21 about it that we have--it is only 40 articles in our
22 bibliography, but we have many more than that--on the
23 subject of the anatomy of the area, appliances and other
24 studies. We have got some of Dr. Clark's studies in our

1 library, also.

2 In terms of success definition, Dr. Lowe uses an
3 RDI of less than 15 and symptomatic improvements, which
4 means the patient declares being more rested. They have
5 stopped snoring and they don't fall asleep during the day
6 and their quality-of-life assessment is improved.

7 I think that covers more of the subjects that Dr.
8 Lowe recited to me.

9 DR. GENCO: Thank you very much, Mr. Plezia.

10 Any comments or questions from that panel?

11 DR. DRUMMOND: You mentioned that after, I think,
12 three months, the CPAP was down 50 percent compliance. Do
13 you have the numbers on compliance for all devices after
14 three months?

15 MR. PLEZIA: No. We are working with a monitoring
16 device right now that fits into an appliance. As I
17 mentioned, all we have is that preliminary study that was
18 just recently done that was where the device was measured
19 over a two-week period and showed 6.8 hours per night on
20 average being worn.

21 DR. CLARK: I can add to that answer if you want
22 me to.

23 DR. GENCO: Surely.

24 DR. CLARK: There have been two long-term studies

1 done by Schmidt-Nowarra and myself where they tracked a
2 series of patients over time. At either two or three years,
3 depending on which study you look at, about 50 percent of
4 the patients that got the appliances are still using them.

5 That is with the custom-made appliances. No one
6 really knows the compliance, long-term--not per-night use
7 but long-term use--of the boil and bite appliances. No data
8 is available.

9 DR. GENCO: Just to clarify, Mr. Plezia. The
10 appliances that Great Lakes sells; they are FDA approved?

11 MR. PLEZIA: Yes.

12 DR. GENCO: Thank you. So they are partially
13 fabricated and then the dentist or the physician or another
14 clinician--who can fit these?

15 DR. PLEZIA: These are all custom. The dentists,
16 in most cases, will take an impression of the upper and
17 lower and a bite registration, send it to us and we will
18 fabricate the appliance according to their script as to if
19 they are moving the mandible, how far they want the mandible
20 moved, for an example.

21 DR. GENCO: How does that differ from custom?

22 DR. PLEZIA: This is custom. That is the
23 definition of custom.

24 DR. GENCO: So you have FDA approval for those

1 custom?

2 DR. PLEZIA: Yes.

3 DR. RUNNER: They are custom in that they are
4 fabricated from a model. However, the device design,
5 itself, is not considered--

6 DR. GENCO: Okay; it is standard design.

7 DR. SHIRE: And the manufacturer is permitted to
8 advertise and distribute and so on.

9 DR. GENCO: Thank you for clarifying that.

10 So you, in essence, have a particular design that
11 if a dentist sent you the model, it would come back looking
12 pretty much the same obviously fit to that model, the same
13 design. And it covers all the teeth and it allows mobility?

14 DR. PLEZIA: All of the appliances we deal with,
15 or we won't deal with them, give you full occlusal coverage.

16 DR. GENCO: So there are two appliances, upper and
17 lower, separate?

18 DR. PLEZIA: Some are single, some are double.
19 Some are mobile, some are fixed.

20 DR. GENCO: So there is a range of mandibular
21 repositioners.

22 DR. PLEZIA: Yes.

23 DR. GENCO: That come under this category of the
24 Dr. Lowe appliance?

1 DR. PLEZIA: Dr. Lowe's appliance is an upper and
2 a lower that is mobile. There are others; the NAPA that was
3 presented, it is a mandibular-positioning appliance but it
4 is fixed. The mandible is fixed forward. There is a
5 formula on how far Dr. George, the developer, wants it in
6 protrusion.

7 There are others that are fixed but are in like a
8 soft material that gives you some--it is mouth-guard
9 material that moves. There are all different types of
10 designs.

11 DR. GENCO: Which one, or with all of those, did
12 you have to go to the FDA to get permission to market?

13 DR. PLEZIA: Our position as a company is we
14 demand clinical studies on all the appliances we work with
15 and we work through all the FDA on all the appliances--

16 DR. GENCO: So you went to the FDA for each one of
17 these separately.

18 DR. PLEZIA: Yes, sir.

19 DR. GENCO: Further comments or questions?

20 That was very useful. Thank you very much.

21 **Open Committee Discussion and Vote**

22 I would now like the panel to address the
23 questions that Susan has given us. This could be the basis
24 for our discussion. Then there will be, of course, a fourth

1 question which would be the categorization, recommendation
2 for category.

3 The first question: should the agency consider all
4 three types of intraoral appliances for snoring and sleep
5 apnea, mandibular repositioners, tongue-retaining devices
6 and palatal lifters as one category or as separate
7 categories or some other variant of that.

8 Anybody want to open the discussion of that? This
9 is full panel and guest interaction here.

10 DR. CLARK: I would argue against lumping them
11 altogether. I think that they are different and have
12 different efficacies. So I would separate them.

13 DR. GENCO: Is there need to talk about palatal
14 lifters?

15 DR. CLARK: Not by me, because they don't work.

16 DR. GENCO: In terms of the subclassification for
17 FDA's purposes, is that an issue? Are there palatal lifters
18 coming in to the FDA? Is there a need for that
19 classification?

20 DR. FURST: In the past, I would say, several
21 years, we have not seen any palatal lifters.

22 DR. GENCO: So would be committee like to
23 consider, then, two subclassifications; mandibular
24 repositioners and tongue retainers. Does that make sense?

1 DR. HENDLER: I think that would be more
2 appropriate. I think palatal lifters and tongue-training
3 devices are the two categories that are virtually
4 nonexistent.

5 DR. GENCO: So the suggestion on the table is
6 mandible repositioners and tongue-retaining devices.

7 DR. BURTON: The only potential trouble is that
8 there are currently illegally marketed palatal lifters who
9 may, then, therefore, say, "We fall outside the perusal of
10 the FDA because we are not class--" so you may need another--
11 -

12 DR. RUNNER: Excuse me; but that is a regulatory
13 issue that we would have to deal with in-house.

14 DR. GENCO: We just have to provide guidance to
15 the FDA on what sorts of things are coming in now. Somebody
16 else can come in with whatever, pinning a tongue to a screw
17 in the mandible. That will be another category.

18 I think we will focus on the panel because we have
19 got to come to some--but go ahead, having said that.

20 MR. PLEZIA: I would just like to differentiate
21 tongue retraining from tongue retaining. There is a tongue-
22 retaining device out there. We market the tongue-retaining
23 device.

24 DR. GENCO: I think the suggestion was that tongue

1 retraining was not something we should be considering. The
2 only two are mandibular repositioners and tongue-retaining.

3 MS. SCOTT: Dr. Genco, may I clarify something.
4 If the devices were pre-amendments, we still need to
5 classify them whether or not we have seen them distributed
6 recently. So, if I may ask Dr. Shire to clarify whether or
7 not all of these are pre-amendments devices and whether or
8 not we have seen 510(k)s for each of these types.

9 If we have, then we need to classify either each
10 type or lump together per what the panel recommends.

11 DR. SHIRE: It would be handy to have a
12 classification for all the anti-snoring devices, all the
13 intraoral devices. We see a preponderance of mandibular
14 positioners or repositioners. We have 510(k) for a few
15 tongue-retaining devices.

16 Susan, what is the status of the palatal lifters?
17 We had one or two, didn't we?

18 DR. RUNNER: We do have a couple.

19 DR. SHIRE: So we would like to ask the panel to
20 recommend classification either separately or as one group
21 for all those products.

22 DR. GENCO: So, by classifying these as separate,
23 or subgroups, does not say anything about safety or
24 efficacy. So we are not making a judgment that they are

1 safe, only that it is a category--

2 DR. SHIRE: It is the degree of regulatory
3 oversight that you recommend.

4 DR. GENCO: So the suggestion, then, is that we
5 have three separate classifications or one classification
6 with three subclassifications.

7 DR. SHIRE: Or two and one. But just please
8 classify all of them.

9 DR. GENCO: So what I am hearing is that they be
10 separately classified either as separate classifications or
11 subclassifications of one classification. So one option is
12 intraoral devices appliances for the treatment of
13 obstructive sleep apnea and snoring--and we will get to the
14 sleep apnea later--and with three subdivisions; mandibular
15 repositioners, tongue retainers and palatal lifters.

16 DR. SHIRE: Correct.

17 DR. GENCO: Is there any objection to that?

18 DR. HEFFEZ: Just a question. So it is possible
19 to market an item which is not proven to be efficacious and
20 yet you have to classify it? If the palatal lifter has not
21 been demonstrated to have any efficacy--

22 DR. SHIRE: If the product was grandfathered in,
23 and that means if it was on the market prior to '76, we
24 don't have the opportunity, right now, unless there is some

1 serious health hazard to comment on that, just provide a
2 classification for the record.

3 DR. GENCO: So what we can do is say, "All right;
4 for any of these, X data would be reasonable to obtain." So
5 that gives you the ability to ask for the data. It is a
6 subtle point, but I think it is important in terms of
7 regulation.

8 DR. SHIRE: We can require a clinical study as a
9 special control; yes.

10 DR. HEFFEZ: The only subcategories I might offer
11 for mandibular repositioners would be fixed, movable and
12 adjustable because there are three distinct types, ones that
13 are solid pieces, ones that allow a little bit of play but
14 stay in the same position, and the other ones that are fully
15 adjustable.

16 I think if you want to consider that, that might
17 subcategorize just the mandibular repositioners. I think
18 the other ones stand alone.

19 DR. REKOW: Are there different indications for
20 those?

21 DR. ALTMAN: Yes; is that a design-feature issue,
22 though?

23 DR. SHIRE: Do you feel we need different
24 regulatory oversight for those three subcategories?

1 DR. ALTMAN: Aren't they really design features?

2 DR. CLARK: My opinion on that would be no. It is
3 a matter of convenience and features, like whether you want
4 a BMW or a Ford. They both get you there. You may have to
5 remake them if you don't like it, et cetera, but it is not a
6 matter of indication. It is a matter of convenience and
7 features.

8 DR. GENCO: Who was it on the panel that said
9 these are design features? Does the panel feel that the
10 mandibular repositioners shouldn't be subdivided?

11 DR. ALTMAN: That's correct.

12 DR. GENCO: Any other comments from the panel on
13 that? So, we have, now, one generic category of intraoral
14 devices for--I won't repeat that--and then three
15 subcategories: mandibular repositioners, which is not
16 further subdivided, tongue-retaining devices and palatal
17 lifters.

18 Any further comment on that from the panel? Any
19 further insights from the guests?

20 Do we need to take a vote on that or is there
21 consensus? Thank you.

22 Next question. This question, Susan, is divided
23 into three subquestions; design features, precautions or
24 risks, and then prescription use. In the context of

1 classification and possibilities for special controls,
2 please address the following issues: design features.

3 For the mandibular-repositioning devices, either
4 one or two piece. Or one piece with slots of spaces to
5 permit breathing. Anybody want to make a comment, either
6 the guests or the panel, with respect to this issue?

7 DR. CLARK: I would be very uncomfortable making
8 any appliance that completely obstructed the oral airway
9 because of the risk of transient nasal obstruction in the
10 patient using it and then getting into distress. So I think
11 all appliances ought to have a patent airway.

12 DR. HENDLER: I think they would be very dangerous
13 appliances. I have never really seen one but it means that
14 you have to insure a nasal airway. Suppose a patient
15 developed a retropharyngeal infection, for example, and had
16 a post-nasal obstruction and couldn't get the thing out of
17 his or her mouth?

18 So, I would not like to see any of them on the
19 market.

20 DR. GENCO: So there are significant concerns
21 about the designs which don't permit breathing, oral
22 breathing. Any comments with respect to the
23 recommendations?

24 DR. HEFFEZ: An additional question. How about

1 loosening of pieces on the appliance and swallowing? I
2 don't know if that is an issue or not.

3 DR. SHIRE: Most of the designs have been either a
4 one-piece construction or have had the attachments, if you
5 will, embedded in the acrylic in such a manner that we
6 didn't feel that the parts would come loose.

7 DR. GENCO: So, there seem to be two possibilities
8 here. We can make some recommendations for one or two
9 pieces or make the functional recommendation that, whatever
10 it is, one or two pieces, it has a patent airway.

11 DR. SHIRE: The way we have been reviewing them,
12 Dr. Genco, has been that if they are one piece that we
13 require that they have spaces for breathing. Some of them
14 have had sort of tubes built into them or slots. If they
15 are two-piece design and they can come apart, then the
16 patient can easily remove it.

17 DR. GENCO: So the common feature is a space or
18 slot for breathing for one or two pieces.

19 DR. FURST: I have a question regarding the two-
20 piece design. Does that mean the two-piece design does not
21 necessarily have to have a space for breathing? Or, by
22 design, do they all have a space?

23 DR. SHIRE: They mostly have space just because
24 the two components don't exactly meet and then the air can

1 get in in other ways.

2 DR. GENCO: So it would seem that the suggestion
3 is, whatever the design, that there is adequate space for
4 oral breathing be a consideration.

5 DR. HENDLER: I think one of the concerns is
6 always relative ease of removal. In other words, if it is a
7 two-piece design, it certainly has to be one that is readily
8 taken apart in a difficult situation as opposed to readily
9 removed if the patient needs it.

10 DR. GENCO: So we have two issues. Let's finish
11 with the first part, and that is the breathing space. I
12 know it is related, but how would you like to deal with
13 that, panel? One way to deal with it is simply say whatever
14 the design, there should be adequate space for intraoral
15 breathing.

16 DR. HENDLER: Right.

17 DR. GENCO: Any disagreement with that? Another
18 issue that is brought up is ease of removal, whether it is
19 one or two piece. Any objection to putting that as a
20 concern for design?

21 MS. ROSECRANS: I was just going to mention that,
22 in the classification, we have to classify what was on the
23 market prior to May 28, 1976, the design, the identification
24 of the design or designs that were out there prior to that

1 time.

2 Then, if you are considering special controls such
3 as labeling or requirements that we might address through
4 guidances, that is something to be considered about what we
5 know about today of the type devices, concerns we may be
6 aware of.

7 DR. GENCO: That was Heather Rosecrans.

8 DR. CLARK: I had a question. You said, "ease of
9 removal." These are removable appliances. I don't think
10 you can measure ease of removal in any tangible fashion. So
11 unless someone is cementing them or screwing them in place,
12 the patient would never wear it if he couldn't remove it
13 easily.

14 So I hate to see something that we can't measure
15 be put into--or which would be foolish to measure, in that
16 sense--as a requirement.

17 DR. GENCO: Possibly, maybe, in someone's
18 experience they have been hard to get out in an emergency;
19 is that what you are saying?

20 DR. HENDLER: No. Basically, most of them are
21 pretty easy to remove. In guess, in using former designs,
22 they are all pretty similar. I am just concerned about a
23 new design coming on that is too rigidly affixed that would
24 have to be looked at. But most of them are pretty easy to

1 take out. They are removable.

2 DR. GENCO: What Heather is saying is that we can
3 put that into the special controls, if that is a concern.

4 MS. ROSECRANS: If you recommend special controls;
5 yes.

6 DR. GENCO: Any other design features? We will
7 get to it again with special controls if that is our
8 pleasure.

9 Let's go to precautions and risks. We have had a
10 suggestion that they not be used in edentulous or partially
11 edentulous with less than six to eight teeth in the lower,
12 that they not be used in patients who had TMD or that they
13 not be used in patients who have periodontal disease.

14 What is your feeling about those?

15 DR. SHIRE: Dr. Genco, with regard to the first
16 part of that, I have a specific question that I would invite
17 the panel to discuss and that is that some manufacturers
18 would like to see labeling that says, "If you wear full
19 dentures, if they are proper-fitting dentures, you can use
20 this product or this device over your existing denture."

21 We have some concerns about that related to oral
22 hygiene and so on. I would like the panel to take that
23 under consideration.

24 DR. GENCO: Any insights into that? That is a

1 different issue than a device made for an edentulous person.
2 This is to wear over a full or partial denture?
3 DR. SHIRE: Right.
4 DR. GENCO: Any experience from the guests?
5 DR. HENDLER: Basically, I don't think they work.
6 When you try to construct them for patients without their
7 dentures in, they definitely don't work. I have never
8 actually seen one that fits over somebody's dentures, but I
9 could see it as being problematical.
10 DR. HEFFEZ: It is the partial denture part that
11 is a problem, I think. I think it is understood with a
12 complete denture, but how do you define a partial denture.
13 Some people literally only have one tooth that is on their
14 partial denture.
15 DR. SHIRE: I meant to say a removable partial
16 denture. Dr. Hendler, as part of that question, do you see
17 any contraindications to a patient wearing a full denture
18 all night?
19 DR. HENDLER: Well, sure. That is, of course,
20 another issue which occasionally we deal with, patients who
21 wear their dentures 24 hours a day. Again, we fall right
22 back to the issue of professional supervising patients under
23 these circumstances.
24 You talk about somebody that has a one-tooth

1 partial denture replacement. Obviously, that patient could
2 have an oral appliance without any problems at all.

3 DR. REKOW: One issue; if the patient is wearing a
4 denture or the patient is wearing this appliance that covers
5 all of the tissues, it is hard to differentiate that one is
6 going to have a higher risk than the other excepting that
7 they are wearing the denture 24 hours instead of maybe 12
8 hours or six hours or something.

9 DR. SHIRE: One of the items I am thinking of, Dr.
10 Rekow, is that the removable full denture would cover the
11 palate. Many of these devices just cover the teeth.

12 DR. REKOW: But many of them are going to cover
13 the palate as well, are they not? Some of the designs
14 must.

15 DR. SHIRE: Some might but they don't cover it,
16 perhaps, as tightly as a denture does, hopefully.

17 DR. REKOW: That's true.

18 DR. CLARK: I would add something, Dr. Genco.
19 Rather than periodontal disease as the only problem, I would
20 say tooth mobility would be a problem if the teeth are
21 loose. The patient may not know they have periodontal
22 disease, obviously, and some mobility of the teeth should be
23 a precaution.

24 DR. GENCO: Panel, any contraindications?

1 DR. HEFFEZ: Are we finished with precautions?

2 DR. GENCO: I am putting this at the extreme,
3 contraindications and then precautions. Any definite
4 contraindications?

5 DR. FURST: I think the issue of children should
6 be addressed as well, whether or not kids up to a certain
7 age should be excluded from using these devices.

8 DR. GENCO: Could you give the panel some advice
9 as to the age?

10 DR. FURST: Generally, children who snore
11 excessively from hypertrophic tonsils, for the most part,
12 puberty is when the tonsils get smaller and the oral cavity
13 is getting larger to the point where the snoring goes away.

14 I think, certainly, at some age past puberty, say,
15 14 or 16 on up, if they are still having significant snoring
16 problems, it could be something that is considered. But,
17 certainly, in small children, snoring is very common and I
18 think it would be a mistake to let small children use these.

19 DR. GENCO: So one contraindication might be
20 children under age 14.

21 DR. FURST: Not necessarily a contraindication
22 but, certainly, it is not indicated for kids under 14.

23 DR. REKOW: I think I would raise that to be non-
24 growing because you could influence the condyle and all of

1 the growth patterns of the jaw if you have some of the
2 devices and they wear them enough.

3 DR. GENCO: So that would be in males, what, 18,
4 20?

5 DR. HENDLER: Females 16, males 18.

6 DR. GENCO: What is the panel's view?

7 DR. HEFFEZ: It varies per patient and, therefore,
8 I would rather make a general statement, "When growth has
9 matured."

10 DR. REKOW: Say, "Non-growing."

11 DR. GENCO: So contraindicated in growing children
12 or growing individuals, individuals not fully grown, and not
13 girth. How would you phrase that? Is this a
14 contraindication or a special instruction?

15 DR. HEFFEZ: My opinion is it would be a
16 contraindication because chronic use could influence the
17 growth of the facial structures.

18 DR. GENCO: So, somehow, we will phrase that so
19 that makes sense. Maybe you could think of a phrase; it is
20 contraindicated for children who are growing or individuals-
21 -

22 DR. REKOW: I guess I am stuck in the orthodontic
23 jargon that just says "non-growing patients." Everybody
24 knows what that means, and that may not be a general enough

1 statement.

2 DR. GENCO: The contraindication would be
3 "growing."

4 DR. REKOW: Yes.

5 DR. CLARK: Can I get clarification on one point?
6 I am not sure whether you are discussing contraindications
7 for patients for appliances sold over-the-counter or
8 appliances made by a professional.

9 DR. GENCO: We are not talking about that yet.

10 DR. CLARK: A contraindication for an appliance
11 made by a professional might be quite different from an
12 appliance sold over-the-counter without a professional
13 involved.

14 DR. GENCO: That is a good point, so we should
15 probably come back to this.

16 DR. CLARK: So the contraindication is, "Never use
17 the appliance under any condition," at this point? That is
18 what we are talking about?

19 DR. GENCO: Right.

20 DR. CLARK: I certainly might make an appliance on
21 a child and I certainly might make an appliance on somebody
22 who is growing based upon my clinical judgment and my
23 monitoring of that patient. So I would disagree that we
24 would call that a contraindication, never use a dental

1 appliance on a growing individual, based on what you think
2 you are doing.

3 If it was a significant problem and the patient
4 sought care and was screened, I might do that on a 14-year-
5 old.

6 DR. GENCO: Let's back off and call it a special
7 instruction, concern, precaution used in the appliance of
8 this appliance to growing children.

9 DR. SHIRE: You can call that a warning, Dr.
10 Genco.

11 DR. GENCO: Okay; a warning. Does that make you
12 feel more comfortable?

13 DR. CLARK: That would be appropriate.

14 DR. ALTMAN: Is there some contraindication for
15 patients under orthodontic care?

16 DR. GENCO: Dr. Rekow?

17 DR. REKOW: Tell me what you are thinking about.

18 DR. ALTMAN: I just wondered if wearing a sleep
19 appliance for years, of somebody was under orthodontic care,
20 would that affect your care of moving the teeth?

21 DR. REKOW: That is going to depend on the design.
22 If it is a very hard plastic that attaches to the teeth,
23 certainly it is going to prevent the teeth from moving. If
24 it is a softer plastic, then they can be reboiled like the

1 sports mouth guards. We don't have concerns over the sports
2 mouth guards because they don't wear them enough and they
3 are able to reshape them enough.

4 So it depends on the design but it certainly is an
5 indication that would need consideration. Another one, too,
6 is the potential flaring of lower incisors, again, entirely
7 dependent upon the design of the appliance.

8 DR. GENCO: That is a design feature, then; design
9 should prevent flare--go back up to a).

10 DR. REKOW: Yes; someplace. As long as it gets
11 addressed someplace, I am happy.

12 DR. GENCO: Under a), that would another design
13 feature to consider. Does anybody on the panel disagree
14 with that?

15 Let's go back to the warnings. Let's use the term
16 "warnings." We got hung up with contraindications, it is so
17 extreme. So far, I have heard from the panel warnings; use
18 in growing patients should be ill-advised, orthodontic
19 cases, loose teeth.

20 DR. REKOW: What about TMJ?

21 DR. GENCO: And TMJ, previous TMJ.

22 DR. CLARK: I would describe the physical symptoms
23 of clicking or grinding or jaw pain because patients may not
24 know what that means.

1 DR. HEFFEZ: I think I would put both because some
2 people just know they have TMJ but don't know--

3 DR. CLARK: Sure. Both would be good.

4 DR. GENCO: TMJ discomfort or dysfunction.

5 DR. CLARK: I would put the physical symptoms of
6 what the patients would be aware of; jaw clicking, grinding
7 and tooth pain, jaw muscle pain.

8 DR. HENDLER: Are these all contraindications?

9 DR. GENCO: No; warnings. We have backed off from
10 the contraindications.

11 MS. SCOTT: Could I ask either Heather Rosecrans
12 or Dr. Shire to clarify whether or not the concern regarding
13 flaring would be a design-feature concern as a special
14 control or a warning for devices that may already have that
15 word, that could already be a potential adverse event?

16 DR. SHIRE: It could be both. Does that help?

17 DR. GENCO: Any objection to making it both? I
18 think that might be prudent.

19 DR. CLARK: Can I comment? Dr. Rekow has said
20 that a rigid appliance that covers the lower teeth is less
21 likely to induce tooth movement. I have seen that happen
22 many times, actually, a hard acrylic appliance where there
23 is long-term tooth movement. It is not as easy to achieve
24 that than with an uncovered set of teeth, but those lower

1 teeth will move even in a rigid acrylic appliance. So I
2 don't think it is a design feature. I think it is a warning
3 or a side effect.

4 DR. GENCO: That's what it is. It is under a
5 warning for individuals under orthodontic care. There is a
6 warning, be aware that there may be problems. So I think
7 that covers it, if the panel is satisfied with that.

8 DR. HEFFEZ: Just on loose teeth, I would also add
9 periodontal disease. I think it is important that some
10 patients recognize their disease and some people recognize
11 their symptoms. So I think it can mean both.

12 DR. GENCO: Any objection to that? I certainly
13 don't.

14 MS. SCOTT: Heather, could you explain the
15 difference between a precaution and a warnings for the
16 panel.

17 MS. ROSECRANS: A warning is something that is
18 serious in nature where it is up to the judgment of the
19 physician whether or not it is in the best interest of the
20 individual. It is fairly serious. A contraindication is
21 something where we feel it should never, ever, under any
22 circumstance, be used. The warning would be one step up
23 from that.

24 A precaution is basically things that are nice to

1 know, that you might want to consider. But a warning would
2 be of a more serious nature but maybe used in some
3 circumstances.

4 DR. GENCO: That is very helpful. It sounds like
5 what we are talking about are warnings. Just to go over
6 them again: warnings; growing patients, orthodontic care,
7 periodontal disease, loose teeth, edentulism, TMJ
8 dysfunction and discomfort including jaw clicking and
9 grinding. So we are really into bruxism. That is a
10 warning; bruxism.

11 DR. CLARK: You can have bruxism and wear these
12 appliances. It depends on how strong.

13 DR. GENCO: Then you don't think it should be a
14 warning?

15 DR. CLARK: No. I think it is a precaution.

16 DR. GENCO: So when you suggested the symptoms--I
17 can understand pain, pain associated with the
18 temporomandibular joint.

19 DR. CLARK: If you make these appliances, you will
20 see patients who have never had a jaw-joint dysfunction all
21 of a sudden start to get one. You will see patients that
22 had a rare one get worse. So I have seen patients who have
23 no clicking develop clicking. I have seen patients that had
24 minor clicking become painful, dysfunctional clicking at a

1 regular level. And I have seen patients develop crepitus in
2 their jaw joint from these appliances.

3 I have seen lots of patients who get jaw-muscle
4 pain and, by and large, they recognize it and they stop
5 using it right away. Those are not the issue. The ones
6 they don't recognize are tooth movements. They will come
7 back and they will say, "Gosh; I didn't know this."

8 DR. GENCO: Just to get the terminology straight.
9 Temporomandibular joint dysfunction and discomfort. Those
10 are a couple of symptoms, sets of symptoms.

11 DR. CLARK: Yes.

12 DR. GENCO: And then jaw click is another.

13 DR. CLARK: Clicking, jaw-grinding noises. I mean
14 grinding of the jaw joint, crepitation.

15 DR. GENCO: Oh; crepitation of the jaw joint. I'm
16 sorry; I thought you meant grinding of the teeth.

17 DR. CLARK: I mis-spoke.

18 DR. STEPHENS: May I ask a question, please? How
19 often have you seen instances in which the problems from the
20 appliances have been significant relative to the benefit
21 that the patient was getting in the treatment?

22 DR. CLARK: In the longitudinal study I did, which
23 is a three-year prospective study, 15 percent of the
24 patients quit using the appliance because of TMJ symptoms.

1 There is no published data on tooth movement because no one
2 has ever measured it. Unfortunately, my estimate that if a
3 patient uses the appliance more than five years, it may be
4 as high as 1 in 10. But that is unpublished, anecdotal, the
5 last one.

6 DR. GENCO: So that is why there should be
7 warnings.

8 DR. CLARK: Yes.

9 DR. GENCO: Does the panel agree with that list of
10 warnings that I led off?

11 DR. HEFFEZ: I don't know if this fits here but if
12 a patient has underlying medical conditions and wears the
13 appliance, should that belong in this category?

14 DR. GENCO: Such as?

15 DR. HEFFEZ: I am thinking that if the appliance
16 is going to be used for snoring, if the person has an
17 underlying condition of sleep apnea, they should have a
18 warning. Or, if they have signs or symptoms that may
19 suggest that they have an underlying cause if the appliance
20 is being said to be used for snoring alone.

21 DR. GENCO: Some advice on that issue?

22 DR. FURST: This comes back to the same issue that
23 has been discussed numerous times and I guess we will get to
24 in question 3, but, certainly, if these devices do go over-

1 the-counter, I agree that some mention has got to be made of
2 symptoms and signs of sleep apnea to alert and educate.

3 DR. GENCO: Okay. So, unless there is some other
4 issue here, now it is boiling down to over-the-counter or
5 prescription, and then we will revisit the warnings.

6 DR. SHIRE: I have a question for Dr. Rekow. Do
7 you think there is any contraindication or warning related
8 to bruxism? I don't think we considered that in our review
9 of these devices.

10 DR. REKOW: I think some of the TMJ people are
11 better able to answer the bruxism question than I am. But
12 my intuition says that it would probably be more helpful
13 than hurtful for bruxism.

14 DR. SHIRE: That's what I was hoping you would
15 say.

16 DR. GENCO: Dr. Clark, do you want to expand on
17 that?

18 DR. CLARK: Being a TMJ person, I tell patients if
19 they have substantial bruxism--and you don't know; you just
20 look at their teeth and, if there is attrition, you assume
21 they do but you don't know if they really do at that point
22 in time--that they have more chance of developing TMJ
23 symptoms because they fight against the appliance if it
24 restricts them.

1 If it allows full lateral movement, and no
2 appliance allows full lateral movement that I am aware of,
3 then you wouldn't have a problem generally. But most
4 appliances, if you brux real hard, you are going to fight
5 the appliance and you will make your jaw sore.

6 But you stop using it if that happens. It just is
7 a warning. If you have bruxism, you may not be able to use
8 it.

9 DR. HENDLER: It is more a precaution than a
10 warning.

11 DR. CLARK: Yes.

12 DR. GENCO: So you would like that as a
13 precaution.

14 DR. CLARK: Yes.

15 DR. HENDLER: You can use these appliances with a
16 patient with bruxism and they do fine with them.

17 DR. GENCO: What does the panel feel? You have
18 heard some opinions; bruxism as a precaution, warning or
19 neither.

20 DR. HEFFEZ: In my opinion, it may help some
21 patients and, in other patients, it is just going to
22 aggravate them and they will stop wearing the appliance.

23 DR. GENCO: Precaution?

24 DR. HEFFEZ: I would say precaution; always err on

1 the--

2 DR. SHIRE: Could it fit, then, underneath the TMJ
3 statement where you might say something like, "Discontinue
4 use of this product if you develop soreness in your joint?"

5 DR. HEFFEZ: That would be acceptable.

6 DR. GENCO: So bruxism not be included either as a
7 precaution or a warning but to be covered by the labeling.

8 DR. SHIRE: That sounds good.

9 DR. GENCO: Does the panel agree to that? Okay.

10 MR. LARSON: Just one other brief comment on risks
11 and warnings. We heard Mr. Brown say that there were no
12 complaints or no reportable complaints. I would just advise
13 FDA staff to review the NDRs to see if there is anything
14 else that should be noted, and they probably would do that
15 anyway.

16 DR. GENCO: Good point.

17 DR. CLARK: My comment on bruxism; if you are a
18 strong bruxer and you buy an over-the-counter appliance, I
19 think you should be warned that it may not work for you,
20 that maybe sometimes it will help them but there are just as
21 many times that it will hurt them. They ought to know that
22 it may not work for them; therefore, don't spend the fifty
23 bucks or a hundred bucks, or whatever, \$29.99--

24 DR. GENCO: This is over-the-counter?

1 DR. CLARK: Yes.

2 DR. GENCO: Okay; let's get to that issue. We
3 keep on wanting to get to that issue. Before we leave 2 b),
4 knowing that we will probably come back to it, precautions,
5 risks, warnings, contraindications, is there anything else
6 that the panel would like to add to that list?

7 Okay; let's go on to prescription use. The issue
8 now, and let's dissociate snoring and sleep apnea at least
9 in the initial discussion, prescription devices or over-the-
10 counter. Let's talk about the claim for snoring versus
11 sleep apnea over-the-counter. One of our speakers this
12 morning suggested we do this.

13 Is there any objection to taking it that way? We
14 can then look at sleep apnea over-the-counter/prescription.

15 DR. LOUBE: I am Dan Loube from the American Sleep
16 Disorders Association. I am also head of the Sleep Disorder
17 Center at Walter Reed Army Medical Center.

18 I think it is very dangerous to dissociated
19 snoring from obstructive sleep apnea since, as we have heard
20 from a number of speakers and myself, that patients cannot
21 adequately separate those themselves.

22 I also think that there is precedent on the market
23 and from the FDA with letting things go out indicated for
24 snoring and then being widely applied for the treatment of

1 obstructive sleep apnea.

2 DR. GENCO: What do you mean; misapplied?

3 DR. LOUBE: Misapplied. There is a procedure
4 called somnoplasty that hit the market in July of '97. What
5 that is is an ENT procedure used--the only indication is for
6 snoring but the way it works is there is a metal rod that is
7 inserted at the intersection of the soft palate and the hard
8 palate down through the tip of the lingula.

9 Radio-frequency energy is applied to that area. A
10 scar is formed and, basically, what that is supposed to do
11 is shrink up the tissue and treat snoring. Now, the only
12 data that this company presented on the efficacy of this
13 procedure for snoring was subjective data, the same type of
14 thing we are hearing about now from these companies,
15 subjective outcomes with respect to snoring.

16 But this is a surgical procedure that people are
17 having for a problem. It costs a lot of money. They are
18 experiencing some risk and, potentially, some discomfort and
19 it is out on the market being widely applied based on
20 subjective outcomes.

21 What I suggest to the group is, if we are going to
22 put something out to the public for them to discriminate on
23 their own, that at least we have some hard outcomes,
24 objective outcomes, to back up the efficacy of this

1 treatment.

2 If it is an important enough problem to treat, it
3 is probably an important enough problem to evaluate and
4 treat objectively.

5 DR. GENCO: So you are arguing for keeping snoring
6 and sleep apnea together.

7 DR. LOUBE: My first point is that if you are
8 going to treat snoring by itself, then treat it adequately
9 and treat it as you would any other medical problem with
10 objective outcomes, not just saying that the patient feels
11 better.

12 The second issue is that all the things that hit
13 the market for the treatment of snoring become widely used
14 for the treatment of obstructive sleep apnea because
15 patients cannot distinguish between snoring and obstructive
16 sleep apnea. The studies that are in the literature
17 demonstrate that subjective outcomes are inadequate to
18 assess treatment response.

19 Patients, either by way of placebo effect or by
20 other things that are going on, cannot subjectively assess
21 an outcome that correlates with objective outcomes. So if
22 you put something out--again, it is two points, but if you
23 put something out for snoring, it is going to be applied for
24 the treatment of obstructive sleep apnea.

1 When Mr. Meade got up here and said, "We would
2 like to have an oral appliance put out for the treatment of
3 snoring," he could hardly distinguish between applying this
4 for the treatment of snoring and applying this for the
5 treatment of obstructive sleep apnea. And he is one of the
6 people who is going to market this appliance.

7 DR. GENCO: Thank you for your opinion.

8 DR. LOUBE: Sure.

9 DR. GENCO: Some advice from the panel. We could
10 go with the wording of the question, re prescription use;
11 intraoral devices for the treatment of snoring and sleep
12 apnea have been cleared as prescription devices. The
13 question we are asked is would this category of devices be
14 classified the same if the products were dispensed as over-
15 the-counter.

16 Is that asking us, Susan, to give an opinion about
17 over-the-counter versus prescription?

18 MS. ROSECRANS: Can I just say something here? I
19 think there may be an error in asking that question because
20 we are not aware of a device on the market of this type
21 over-the-counter. When we review this type indication in a
22 510(k), the 510(k) process is a classification procedure.

23 So I don't think we need your recommendation on
24 over-the-counter use. I think we certainly can use the

1 experience that we have listened to today in case we ever
2 get an application for over-the-counter.

3 DR. GENCO: Thank you.

4 MS. ROSECRANS: They have been non-equivalent in
5 the past so we can still take into consideration--

6 DR. GENCO: Okay; so the issue of over-the-counter
7 versus prescription we shouldn't address.

8 MS. ROSECRANS: I don't think it needs to be
9 addressed as far as classification. Certainly, people could
10 submit a 510(k) and make their case for over-the-counter.

11 DR. GENCO: So let's skip c), then.

12 DR. HENDLER: Aren't we in the position to make
13 recommendations of whether something like this should be
14 over-the-counter or not?

15 MS. ROSECRANS: That was more or less what I was
16 saying, that we are listening to your experience and views
17 on that but that it not part of what was on the market prior
18 to May 28, 1976.

19 DR. HENDLER: I think if we are to accept the fact
20 that industry is very interested in helping the common good,
21 then, if industry has such as wide-ranging, huge patient
22 population that responds positively to their devices, we
23 need some hard data.

24 We need some studies that support the claims that

1 50,000 people can be helped and not 90 out of 50,000.

2 MS. ROSECRANS: To date, I guess I would say that
3 is more or less what we have said, if you don't mind me
4 interrupting, Dr. Genco.

5 DR. GENCO: Surely.

6 MS. ROSECRANS: We have found these devices to be
7 not substantially equivalent and requested premarket
8 approval applications for the over-the-counter use. We
9 have, on rare occasions, changed our mind and found that we
10 were in error when we made a not-equivalent decision but,
11 most of the times, we don't.

12 DR. GENCO: So what we should address is, number
13 one, classification next and, number two, the types of data.

14 MS. ROSECRANS: Right; and any recommendations you
15 have for prescription use, as you were just discussing,
16 labeling for prescription use.

17 DR. GENCO: I am not understanding. You are
18 saying that we were not to address the prescription versus
19 over-the-counter issue except in general terms.

20 MS. ROSECRANS: You don't need to address the
21 over-the-counter.

22 DR. GENCO: But to consider these as prescription
23 in the classification.

24 MS. ROSECRANS: Yes.

1 MS. SCOTT: Dr. Genco, could I ask Heather to
2 clarify one more thing. Can the panel discuss over-the-
3 counter versus prescription use in relation to whether or
4 not the level of regulatory control would be the same or
5 different if the devices were over-the-counter?

6 MS. ROSECRANS: No, because they were not on the
7 market over-the-counter, to the best of our knowledge, prior
8 to May 28, 1976. So what we are classifying are those
9 devices that we missed in the initial classification
10 process.

11 To date, these intraoral appliances that have come
12 in for over-the-counter use have found not equivalent, thus
13 requiring premarket approval applications. So we have, in
14 that sense, classified them as class III premarket approval.

15 DR. GENCO: So that could be the issue of another
16 panel or another discussion.

17 MS. ROSECRANS: If we had a premarket approval
18 application; right.

19 DR. GENCO: Thank you.

20 MS. SCOTT: Or a potential reclassification
21 petition.

22 DR. GENCO: Thank you. Is that clear to the
23 panel? We will go right to classification and then to data.
24 Let's go to classification then. Any suggestions from the

1 panel as to this generic group, recommendations to the
2 agency--just to recap; the generic group are the intraoral
3 devices for snoring and sleep apnea.

4 There are three subgroups; mandibular
5 repositioners, tongue-retaining devices and palatal lifters.
6 It is possible to classify all three subgroups as one
7 category or as separate categories.

8 DR. RUNNER: May I just make one comment, Dr.
9 Genco?

10 DR. GENCO: Surely.

11 DR. RUNNER: In our previous discussion, we had
12 asked every panel member to fill out the sheet together, if
13 that is the stage you are at now, to each fill out their own
14 so that we have copies from each panel member. Yours would
15 be the master.

16 DR. GENCO: Okay, good. Does everyone have the
17 worksheets? First, let's address whether we think that all
18 three subcategories should be the same classification. Is
19 there any need to classify any of the three subcategories
20 differently? Does anybody have an opinion on that; classify
21 them the same or should we look at each separately?

22 Should the mandibular repositioners and the
23 tongue-retaining devices and the palatal lifters be the same
24 or different categories? What is your feeling?

1 DR. HEFFEZ: My feeling is the same. Each one
2 should be considered separately but I am looking at them as
3 subclasses.

4 DR. GENCO: We ought to look at each one
5 separately for categorization. Does anybody agree with
6 that?

7 DR. RUNNER: You are saying that the generic type
8 of device is intraoral appliances with three subgroups.

9 DR. GENCO: Right; and the classification
10 recommendation be for the generic type rather than for each
11 subgroup. What is your feeling on that? Do we discuss it
12 as one generic group, intraoral devices? Perhaps, Leslie,
13 if it looks like one or the other should be in a different
14 category, maybe that will come out in the discussion.

15 Why don't we start with them as all three
16 subgroups in one category.

17 DR. HEFFEZ: Okay.

18 DR. GENCO: So the generic devices we are talking
19 about are the intraoral appliances for snoring and sleep
20 apnea.

21 DR. REKOW: Are they removable intraoral devices?
22 Is it important to put that word in?

23 DR. RUNNER: I don't think any of them are
24 permanent. We have not seen any permanent appliances.

1 DR. REKOW: There are some in orthodontics, just
2 so you start paying attention to that.

3 DR. SHIRE: Susan, excuse me; I think we have seen
4 one that is an implantable screw. Is that an intraoral
5 device?

6 DR. RUNNER: That is a different--

7 DR. SHIRE: That is an intracranial device?

8 DR. GENCO: So we are talking about the removable
9 types. Shall we add that to the generic class? Good point,
10 Diane. Removable intraoral devices for snoring and sleep
11 apnea.

12 MS. SCOTT: Dr. Genco, and correct me if we should
13 proceed in a different manner, Heather, for the purposes of
14 classifying and then, subsequently, writing the regulation,
15 does the panel need to fill out separate questionnaires and
16 supplemental data sheets for each subgroup even if it is
17 under one regulation, particularly if they happen to
18 recommend different classes for each subgroup?

19 MS. ROSECRANS: I think we are asking for the
20 panel's recommendation so it is really how you see it. And
21 then we will ultimately decide if it is going to be one
22 heading with different subgroups.

23 So then I would fill out the separate ones if you
24 feel they need to be separate. Otherwise, it is fine to put

1 them on one sheet. Does that answer the question?

2 DR. GENCO: Yes; thank you. I don't hear any real
3 strong sentiment to consider them separately. Let's
4 consider them as one. If it falls out that they are
5 separate, then we can go back.

6 MS. ROSECRANS: We can have, in a classification
7 regulation, a general name for the device and then one, two,
8 three, four categories.

9 DR. GENCO: Let's go through the questions, then.
10 Does anyone think the device is life-sustaining or life-
11 supporting? So the answer is no. Is the device for use
12 which is of substantial importance of preventing impairment
13 of human health? Does anyone think that that answer should
14 be yes? No?

15 DR. FURST: In some rare cases, patients who could
16 not tolerate CPAP who are not surgical candidates, who are
17 using an oral device for severe sleep apnea for whom they
18 cut their sleep-apnea score in half, you would say yes to
19 that person. So, occasionally, it could be.

20 DR. GENCO: Is it of substantial importance in
21 preventive impairment of human health? Substantial means
22 what; for a significant portion of the population? Is that
23 what you are interpreting?

24 DR. CLARK: Significant portion of the treated

1 population?

2 DR. GENCO: I am asking the question, substantial
3 importance in preventive impairment of human health. We
4 have heard that, in some instances, it is important. Is
5 that sufficient to answer this yes?

6 MS. SCOTT: Could the panel provide verbal
7 responses to the chair for the record, please.

8 DR. GENCO: Thank you.

9 DR. DRUMMOND: The word "substantial" would
10 indicate to me that the answer should be no. In rare
11 occasions, maybe. But substantial indicates the general
12 public and not a specific public.

13 DR. GENCO: Any further opinions from the panel?

14 DR. HEFFEZ: I made one statement before and I am
15 going to make it again. I don't think that the studies, and
16 please correct me if I am wrong, have adequately indicated
17 that establishing a baseline RDI--have adequately
18 established a baseline RDI for patients in order to make the
19 statement that the appliances have truly reduced the RDI of
20 that patient.

21 DR. HENDLER: I don't think that is true.
22 Establishing the RDI is a function of how long you do the
23 sleep study and how good the sleep study is. So I think
24 there are certain studies that show us fairly reliable data

1 as to what the pre-insertion RDIs are, but polysomnography
2 is a lot more than just the RDI.

3 I think the RDI and the oxygen desaturations are
4 always pulled out because they are the catch things that you
5 can look at real quickly and make a sort of a snapshot
6 decision.

7 You take a full polysomnography. I think there is
8 sufficient data in several of these studies to indicate the
9 efficacy of oral appliance therapy.

10 DR. HEFFEZ: But the studies indicate that the
11 only things that are statistically significant are the
12 desaturation and the RDI. Those are the only two points
13 that end up in the studies to be statistically significant.

14 DR. HENDLER: They are pulled out of the studies
15 in order to substantiate the efficacy. But I think there is
16 more in the studies that show that these things work.

17 DR. GENCO: So, Leslie, you are suggesting that
18 the answer to the question be "no," based upon the data that
19 we have?

20 DR. HEFFEZ: My feeling is that you can't
21 determine an RDI on a one-time basis, you cannot determine a
22 baseline, what that person represents in order to measure
23 what the efficacy of the instrument is. But I am willing to
24 listen.

1 DR. CLARK: I will comment on that. The standard
2 in sleep medicine is a one-night polysomnography. That
3 measurement might give you a false negative, but it never
4 gives you a false positive. If you have a high RDI, it's
5 high. You might miss it that night because the person
6 doesn't sleep and you might get a low RDI when they really
7 are high at home.

8 But you never get a high apnea/hypopnea index in a
9 one-night polysomnogram. There is usually about a five-hour
10 period the average study runs. You measure multiple events
11 across that time period and each event is a legitimate
12 measurement.

13 So I think I would disagree with you.

14 DR. HEFFEZ: I understand there is a false-
15 positive/false-negative, but the degree of positivity is the
16 way we are measuring whether the appliance improved. For
17 example, did he go from an RDI of 50 to an RDI of 20?

18 DR. CLARK: Right. There have been two studies
19 where the gold standard is CPAP. There have been two
20 studies where it was crossover design research where they
21 got CPAP and they got the dental appliance at different time
22 periods.

23 CPAP is a more powerful treatment, but the dental
24 appliance is shown to be efficacious, not as powerful but

1 clearly clinically important. So I think the data is there
2 for sleep apnea with dental appliances compared to CPAP.

3 DR. HEFFEZ: CPAP has eliminated the RDI; is that
4 correct?

5 DR. CLARK: Not always.

6 DR. HEFFEZ: But in a significant number of cases,
7 it eliminates the RDI.

8 DR. CLARK: It depends on whether you do the study
9 the first night or you wait awhile. There are two studies
10 in the literature only that have done a true comparison and
11 only the one study that I was involved with where they
12 actually were blind to the polysomnography they were
13 scoring, which makes it a little bit more valid.

14 In those cases, some of the CPAP scores did not go
15 down either. But it was still more powerful by far than the
16 dental appliance. But the dental appliance was an
17 efficacious therapy.

18 DR. HEFFEZ: Does the appliance ever eliminate the
19 RDI?

20 DR. CLARK: It can, yes, but not always. But not
21 always.

22 DR. HENDLER: In milder cases, it certainly can.
23 It could also increase oxygen saturations considerably so we
24 are talking about patients that have mild or low-moderate

1 problems.

2 DR. GENCO: Let me just orient what we are doing
3 here.

4 DR. CLARK: Yes; we are off on a tangent.

5 DR. GENCO: We are asking these questions so that
6 it leads to a classification. If you said yes, then it
7 almost eliminates the possibility that it would be category
8 I. It would be either II or III. So, if you say no, you
9 still have the possibility of II or III because there are
10 several other questions.

11 Just to put that into perspective. This is a
12 logical progression of questions leading us to a
13 categorization. So what does the panel feel with this
14 discussion? Is the answer to question 2 yes or no?

15 MR. LARSON: Mr. Chairman, we need advice from FDA
16 on this, but I think that the answer to question 2 doesn't
17 depend on effectiveness issues or measurement issues at all.

18 DR. GENCO: Indirectly it does, and I wanted to
19 have that discussion. But let's us go to the question.

20 MR. LARSON: Okay; I was thinking of indication
21 more than anything else. And the answer is no.

22 DR. GENCO: Anybody else have an opinion? Leslie,
23 would you agree with that, that the answer would be no to
24 question 2?

1 DR. HEFFEZ: Yes; no is the answer.

2 DR. GENCO: Does anybody disagree with that answer
3 as no?

4 DR. CLARK: Can I ask for clarification?

5 DR. GENCO: Yes.

6 DR. CLARK: When you say "substantial," do you
7 mean substantial for the individual or substantial for the
8 population of patients being treated?

9 DR. GENCO: I think we are talking about the
10 population. That is how we are interpreting it.

11 DR. HENDLER: Being treated or the general
12 population.

13 DR. GENCO: The general population. Is it a big
14 health problem out there that this device addresses,
15 improves?

16 DR. CLARK: How do you define such a round word
17 like "substantial for the population?" I have trouble with
18 that. What would be the panel's opinion about what does
19 substantial mean? Does it mean 50 percent of the
20 population? Does it mean 100 million people, which is a
21 third of the population?

22 DR. RUNNER: I know the wording is very broad, but
23 I think FDA probably had in mind something like a heart
24 valve or something--an artificial heart or something that

1 could have a substantial effect or something that would be a
2 major technology to improve human health--am I interpreting
3 that wrong--when it is substantial. That is what I am
4 interpreting it as.

5 DR. GENCO: With that interpretation, it is in a
6 small percentage of the population, in those affected.

7 DR. HENDLER: So it is not the general population.
8 It is in the patients that are treated with this device.

9 DR. GENCO: So we could put it either way. In
10 those patients that are treated, does it have a substantial
11 health benefit?

12 DR. CLARK: Yes. Again, it depends on what you
13 are treating. If you are treating snoring, health benefit
14 is a social benefit. If you are treating apnea--

15 DR. GENCO: We are talking about removable
16 intraoral devices for snoring and sleep apnea.

17 DR. CLARK: And sleep apnea.

18 DR. GENCO: What I have heard it that they treat
19 snoring and, inadvertently, treat a few cases of sleep
20 apnea. No?

21 DR. CLARK: No. It depends on who does it.

22 DR. HENDLER: No, no. They are intentionally used
23 to treat patients with sleep apnea.

24 DR. GENCO: First line of therapy for snoring and-

1 -

2 DR. HENDLER: First line of therapy in many
3 patients that have sleep apnea.

4 DR. GENCO: And they are first line of therapy for
5 mild to moderate sleep apnea.

6 DR. HENDLER: To moderate and even severe.
7 Remember, we talked about the severe apneics who refuse
8 CPAP, can't tolerate CPAP, refuse surgery first line.

9 DR. GENCO: I'm glad we had that discussion.
10 Panel, any reconsideration of the answer to question 2; is
11 the device for use which is of substantial importance in
12 prevention of the impairment of human health in even a few
13 people? Those few people; that is 100 percent for them.

14 DR. STEPHENS: I would leave it no.

15 DR. GENCO: Anybody else?

16 DR. HENDLER: If you say in a few people, or in a
17 small--you can't say no because they are used for people
18 that are real sick. So that is one issue. Now, if you say
19 that it falls out to a smaller percentage of the overall
20 sleep population that gets treated by CPAP and surgery and
21 all the other, then you could sort of, I guess, make it a
22 no.

23 DR. GENCO: I have a suggestion. Let's go to
24 question 3.

1 DR. LOUBE: Could I just make a comment quickly?

2 DR. GENCO: Surely.

3 DR. LOUBE: 40 percent of the patients who are
4 prescribed CPAP don't use it. That is as huge population of
5 patients. For those patients, it is either upper-airway
6 surgery or oral appliances. The success rate of oral
7 appliances to treat mild to moderate obstructive sleep apnea
8 for appliances that are adjustable is 50 or 60 percent in
9 the recent studies.

10 The success rate to treat patients who have severe
11 obstructive sleep apnea is 40 to 50 percent when you use a
12 cutoff of an RDI of either less than 15 or ten events per
13 hour. We don't think that there may be much less health
14 risks or bad outcomes associated with low RDIs.

15 These appliances are very important in clinical
16 practice to the patients and the doctors that are using
17 them. We know that they work. So I think maybe we did a
18 bad job of trying to educate you about what these are.

19 DR. GENCO: I think there was some confusion. I
20 think we are hearing something--at least I am hearing
21 something--a little different from what we heard before.

22 DR. SHIRE: Don't forget that we can have a
23 separate classification for different intended uses. In
24 other words, we can have one classification for devices that

1 are intended to treat sleep apnea. It could even be the
2 same device. If it is intended to treat snoring, it could
3 have a separate classification.

4 DR. GENCO: With that in mind, and we are
5 classifying the devices, at this point, to treat both, or
6 either/or.

7 DR. SHIRE: Or split it. Don't forget, we can
8 require clinical data to support a claim for one or the
9 other.

10 DR. GENCO: Okay; now, we attempted to split
11 before and we decided not to.

12 DR. SHIRE: Were we splitting according to
13 intended use or were we splitting according to device type?

14 DR. HENDLER: Based on the fact the we have no
15 clinical data of any significance in regard to splitting
16 them, I think it is a good idea to hold them together first
17 before we start fishing for clinical data.

18 DR. GENCO: Let's get to what the data is. Let's
19 go to question 3. I think what this leads to is a
20 classification--we are going to get hung up on this question
21 all day, question 2. We can come back to it. Let's go to
22 question 3.

23 MS. ROSECRANS: Dr. Genco, could I just make one
24 clarification before you start number 3. Getting back to

1 the over-the-counter and the prescription use discussion
2 that we had earlier, I want to try to reemphasize what I was
3 saying in this classification discussion, because we are not
4 aware of any pre-amendment devices that were over-the-
5 counter.

6 So, in the classification, we are not going to be
7 able to discuss over-the-counter use. But the division is
8 interested, after we complete the questionnaire on
9 classification, in the panel's views of over-the-counter use
10 of devices of this type.

11 DR. GENCO: Don't let me forget that, then.

12 MS. ROSECRANS: Okay.

13 DR. SHIRE: We won't.

14 DR. GENCO: Let's go to number 3. Is your comment
15 relative to 3?

16 DR. BURTON: Yes. The idea of having an
17 indication for snoring and sleep apnea lumped together is
18 something--it is not clear to me if it has been closed or
19 not. It is important, I think, a disservice, to
20 automatically lump a device and say that we are going to
21 lump an oral appliance for snoring and apnea because,
22 basically, you are saying because we happen to be very
23 effective in snoring, you are going to punish the snorer
24 because it also happens to have some effectiveness in apnea.

1 We need to not--I think the appropriate way is to
2 have, if you want a claim to something with apnea, make the
3 burden of proof greater. You have that opportunity. Make
4 the burden of proof greater. Require clinicals. Require
5 efficacy.

6 But, in reality, there is no reason to even have
7 to prove that you fixed snoring. Snoring is not a medical
8 problem. It is a social problem. There is no medical risk
9 if you fail to fix snoring. So you should not burden them
10 with having to have clinical proof.

11 Because they want to compete in the market, they
12 will make studies. They will make proof, just like what you
13 see with Breathe Rite. They are going to throw white
14 papers. They are going to have proof. That is what
15 happens. The consumer is going to demand--

16 DR. HENDLER: So you suggest no proof?

17 DR. BURTON: You don't have to have proof. The
18 FDA should not be saying, "Prove snoring," because the FDA
19 has nothing to do with snoring. That is what I am saying.
20 You are trying to drag snoring into a medical condition. I
21 gave much data, not just me. Snoring is not an FDA issue.
22 Separate the two.

23 DR. GENCO: Thank you for that perspective. I
24 will ask the panel again, in all fairness, do you want to

1 consider the indication for snoring and the indication for
2 apnea separate or together? Remember, if we put them
3 together that the claims for this device category can
4 require different levels of data; is that true?

5 MS. ROSECRANS: Yes.

6 DR. GENCO: So we can get to that in the
7 experiments.

8 MS. ROSECRANS: For example, in a guidance
9 document, we can address--

10 DR. GENCO: If for snoring, X experiment. If for
11 apnea, X experiment.

12 MS. ROSECRANS: Yes.

13 DR. GENCO: So keep them together? In my mind, I
14 think we have dealt with that fairly. So we will keep them
15 together. Let's go to question 3; does the device prevent a
16 potential unreasonable risk of illness or injury? Anybody
17 want to say yes? Does everybody agree that it is no?

18 Let's go to question--we can't go to question 4.
19 Let's go to question 5; is there sufficient information to
20 determine that general controls are sufficient to provide a
21 reasonable assurance of safety and effectiveness? In other
22 words, if there are general controls--that is, not special
23 controls--that are adequate, then this would go to class I.

24 If there are special controls necessary, it would

1 become II or III.

2 DR. HEFFEZ: I think we have to answer number 2 in
3 order to--

4 DR. GENCO: We could, but we don't. I have gone
5 through this. If we go to 5 and 6, we will come to a
6 conclusion without 2.

7 DR. HEFFEZ: Okay.

8 DR. GENCO: And I suggest we do that. Are general
9 controls adequate? Yes or no? Anybody say yes?

10 DR. FURST: Can I ask a question?

11 DR. GENCO: Yes.

12 DR. FURST: Do the general controls include all of
13 the warning and precautions that we discussed earlier or
14 not?

15 DR. GENCO: Let's have a revision of what--could
16 you restate what the general controls are usually?

17 MS. ROSECRANS: General controls would be the
18 requirement for a 510(k) which the panel can recommend be
19 exempt from a 510(k), good manufacturing practices
20 requirements which they can also recommend be exempt,
21 misbranding, adulteration, registration listing of the firm
22 and its products, mandatory device reporting, other record
23 keeping, notification requirements, et cetera.

24 DR. HENDLER: The general controls place the

1 burden on the manufacturer to come out with appropriate
2 labeling?

3 DR. GENCO: No; we mean special controls. They
4 are not special experiments. They are not special
5 precautions, performance standards, guidances.

6 DR. FURST: So to say yes to that would ignore all
7 of those warnings that we discussed earlier.

8 DR. GENCO: Exactly. So, does anybody want to say
9 yes to number 5? If you say no, then we would go to the
10 possibility of classifying in 2 or 3. If you say yes, we
11 would consider classifying as category 1. No?

12 Okay. So the answer to question 5 is no. That
13 brings us to 6; is there sufficient information to establish
14 special controls to provide reasonable assurance of safety
15 and effectiveness? Yes? Any objection to yes for that?

16 Then we go to question 7; is there sufficient
17 information to establish special controls to provide
18 reasonable assurance of safety and effectiveness? We have
19 already said yes. So that would put it into class II. Any
20 objection to that? Let's discuss that.

21 DR. HEFFEZ: No objection.

22 DR. GENCO: So question 7, the first part, is yes?
23 That puts it into class II. If yes, what are the special
24 controls that we feel are needed to provide a reasonable

1 assurance of safety and effectiveness that we would
2 recommend to the FDA to do?

3 Let's go through them. Post-market surveillance,
4 which means exactly what?

5 MS. ROSECRANS: I will read from the overhead. It
6 is required on implants, the failure of which cause adverse
7 health consequences, or required when the agency determines
8 it is necessary to protect public health or provide safety
9 and effectiveness data.

10 DR. GENCO: That is the new study.

11 MS. ROSECRANS: It is a brand-new study where you
12 have protocol approved in advance.

13 DR. GENCO: It is not just monitoring adverse
14 effects. This is a brand-new study looking at adverse
15 effects.

16 MS. ROSECRANS: Yes.

17 DR. GENCO: Do we think that that is necessary?
18 No? Does anybody think that is necessary? How about
19 performance standards. This is that very rigorous set of
20 standards. The alternative here is reference to guidances.
21 That is the other extreme. So if you want performance
22 standards, then that would be this very rigorous set of a
23 protocol to be followed for performance.

24 MS. ROSECRANS: It would be a mandatory standard.

1 DR. GENCO: So the alternative would be--

2 MS. ROSECRANS: We can recognize voluntary
3 standards. We can address data we would like, clinical data
4 and so forth, in a guidance document.

5 DR. GENCO: Like the testing guidelines further
6 down.

7 MS. ROSECRANS: Yes.

8 DR. GENCO: So if we check that, that requires
9 this very rigorous performance standard.

10 MS. ROSECRANS: And a rulemaking process; yes.

11 DR. GENCO: Anybody want that checked?

12 DR. STEPHENS: I would say no.

13 DR. GENCO: No? Okay. Patient registries. We
14 heard that there are only one or two sets of devices for
15 which there are registries. Is there a need for--

16 MS. ROSECRANS: That is pacemakers right now.

17 DR. GENCO: Pacemakers only. Any need for that?
18 No? Device tracking?

19 DR. STEPHENS: No.

20 DR. GENCO: Testing guidelines?

21 DR. STEPHENS: I think that is no, too.

22 DR. HENDLER: What do you mean?

23 DR. GENCO: We can discuss that. That can be
24 guidances which are formal but have some dynamic potential

1 for change over time. So the guidances could be, for
2 snoring, this is the kind of data that would be needed. For
3 sleep apnea, this would be the kind of data. We don't have
4 to come up with those today, just the outlines of those.

5 MS. ROSECRANS: Right; you would be recommending a
6 guidance document. But if you have special, as you have
7 discussed--

8 DR. GENCO: Special issues to be considered in
9 such a guidance document to be developed over time.

10 MS. ROSECRANS: Yes.

11 DR. GENCO: So, if we say testing guidelines, we
12 could say that we would have separate testing guidelines for
13 sleep apnea and separate testing guidelines for snoring and
14 that the guidances have these characteristics for each.

15 DR. HEFFEZ: That sounds logical.

16 DR. GENCO: So testing guidelines?

17 DR. HEFFEZ: Yes.

18 DR. SHIRE: Dr. Genco, don't forget we also have
19 the tongue-retaining devices, and if there are some special
20 requirements for that particular subcategory.

21 DR. GENCO: Okay; we can get into that matrix,
22 then. Anything else? Is that specific labeling?

23 MS. ROSECRANS: You can recommend a discussion of
24 labeling in the guidance document or you can actually

1 recommend specific labeling as a separate special control.

2 DR. GENCO: I think we discussed that. Those are
3 the warnings.

4 MS. ROSECRANS: The ones you have mentioned. Does
5 anybody object to checking also other specified--that would
6 be specific labeling, warnings, as per our discussion
7 before. These are all prescription, now.

8 DR. HEFFEZ: I would not object, but if the item
9 was used for snoring, we would have to add some warnings,
10 specific warnings, related to medical conditions.

11 DR. GENCO: Okay. So here the specific labeling
12 could be for snoring claims and another set, maybe with some
13 overlap, for sleep apnea.

14 DR. HEFFEZ: Correct.

15 MS. ROSECRANS: I would just like to remind
16 everybody that we do have a blue-book memo on good guidance
17 practices. Any guidance that we develop will be out for
18 comment and be made available to the public.

19 DR. GENCO: So we are just to make some broad
20 comments on what the guidances should consider in their
21 specifications.

22 Let's go on to the next page, page 2; if a
23 regulatory performance standard is needed to provide
24 reasonable assurance of the safety and effectiveness of a

1 class II or III device, identify the priority. So we have
2 said it should be class II. What is the priority--

3 MS. ROSECRANS: That is only if you recommend a
4 performance standard.

5 DR. GENCO: Ah; it is irrelevant. So skip 1.
6 Skip 2? Also the same thing?

7 MS. ROSECRANS: Skip 8 and 9; yes.

8 DR. GENCO: I'm sorry?

9 DR. REKOW: Ours are numbered differently.

10 MS. ROSECRANS: Oh; your numbers are different?

11 DR. GENCO: On page 2; for a device recommended
12 for reclassification to class II--

13 MS. ROSECRANS: Yes; I'm sorry.

14 DR. GENCO: --should the regulatory performance
15 standard take the place for reclassification? We skip.
16 Class III, we skip. Because of any potentially harmful
17 effects, we are not really concerned about safety here, so
18 it looks like 4 is irrelevant also.

19 DR. SHIRE: We are reading off of different pages.

20 DR. ALTMAN: It is the last question.

21 DR. GENCO: Let me read the question; because of
22 any potentiality for harmful effect, are collateral measures
23 necessary for the device's use? Can there otherwise be
24 reasonable assurance of its safety and effectiveness without

1 restrictions on its sale distribution or use?

2 MS. ROSECRANS: That is, for example, the
3 prescription use statement. That would be one restriction.

4 DR. GENCO: Do we want restrictions? Is that, for
5 example, the growing children? Is that the sort of thing,
6 or is that label? That is a contraindication?

7 MS. ROSECRANS: Those are warnings; right.

8 DR. GENCO: The warnings would come here.

9 MS. ROSECRANS: No, no; you have already addressed
10 that under special controls.

11 DR. GENCO: So we don't have to deal with that?

12 MS. ROSECRANS: It is restrictions.

13 DR. STEPHENS: Do we need to make a statement
14 regarding over-the-counter distribution here?

15 DR. SHIRE: Not as it pertains to classification
16 because there are not over-the-counter products currently
17 marketed. However, I am soliciting your opinions and views
18 on that subject at the conclusion of the classification
19 procedure.

20 MS. ROSECRANS: I think the more important part of
21 that question that we just addressed was use only by persons
22 with specific training or experience in its use, use only in
23 certain facilities, other--if you have any recommendations
24 towards those views.

1 DR. GENCO: Is there any objection, on question 4,
2 then, that we consider that these would be only used by
3 persons with specific training or experience in use and in
4 certain facilities.

5 MS. ROSECRANS: Yes.

6 DR. FURST: There is also a question regarding
7 prescription. It only asks about, only upon written or oral
8 authorization of a practitioner licensed by law. So that is
9 by prescription or over-the-counter.

10 DR. GENCO: Rx; right. We are talking about Rx.
11 So all three of those would be--

12 MR. LARSON: Are we deliberately excluding, in our
13 recommendation, any over-the-counter use of something that
14 is labeled "just for snoring?"

15 DR. GENCO: I think that that we are not
16 discussing. We can come to some opinions about that, but
17 they are not asking us to address that particular issue
18 today.

19 MS. ROSECRANS: As part of classification. But
20 after we finish the forms, then, yes, we are asking that.

21 MR. LARSON: If we answer this question, we are
22 addressing it.

23 MS. ROSECRANS: We can only classify what was
24 legally on the market prior to May 28, 1976. We are not

1 aware of any that were other than prescription use. This
2 question can be used when there are different circumstances.
3 It is just a generic form. So, unfortunately, it is
4 somewhat confusing here.

5 MR. LARSON: But the reading of this will be taken
6 as a recommendation by this panel that they not grant any
7 over-the-counter uses.

8 MS. ROSECRANS: No; that will not be. We are only
9 classifying the devices from pre-'76.

10 MR. LARSON: Okay.

11 DR. GENCO: We are doing what we have been asked
12 to do, which you heard several times. But, having done
13 that, now we are asked the question, what do you think about
14 over-the-counter. And we can say whatever.

15 MR. LARSON: Okay.

16 DR. GENCO: So this is part of that
17 reclassification effort that we heard about of all those
18 thousand devices.

19 Do we need to fill out this supplement datasheet?

20 MS. ROSECRANS: Yes.

21 DR. GENCO: The generic type of advice. Is the
22 device an implant? No. Indications for prescribed,
23 recommended or suggested in the device's labeling that were
24 considered by that panel. Snoring and sleep apnea.

1 DR. SHIRE: Obstructive sleep apnea.

2 DR. GENCO: Okay; snoring and obstructive sleep
3 apnea. Risk to health prevented by the device. Those we
4 discussed before. They are in the minutes. You have got
5 that. Do you want to go through that again; sore teeth,
6 sore gums, TMD, pain dysfunction syndrome, flaring of the
7 lower anteriors?

8 DR. SHIRE: What about requirement of breathing
9 spaces for one-piece devices?

10 DR. GENCO: Obstruction of breathing. Risk to
11 health. Now, specific hazards to health. Let's go through
12 them; painful gingiva. What is the feature of the device
13 that is associated with that hazard. Is that the fit, at
14 the gingival?

15 DR. CLARK: Pressure, pressure-induced abrasion or
16 attrition.

17 DR. GENCO: The same for loosening of teeth?

18 DR. CLARK: It is the long-term orthodontic effect
19 of the appliance.

20 DR. GENCO: Loosening of teeth and flaring of
21 teeth, we could put under that, then.

22 DR. HENDLER: I think you should just have a
23 general "tooth movement." It could be any number of
24 different teeth. So rather than getting so specific about

1 flaring of anterior teeth, just say generalized tooth
2 movement.

3 DR. GENCO: Okay. TMD. What is that associated
4 with, temporomandibular joint dysfunction and discomfort and
5 crepitus.

6 DR. CLARK: Loading of the joint tissues as a
7 result of the appliance's forward position.

8 DR. HENDLER: Unfavorable loading.

9 DR. CLARK: Also, if it is not adjusted properly,
10 it can tip the jaw side to side and disrupt one joint.

11 DR. GENCO: So it is poor adjustment? That is the
12 feature?

13 DR. CLARK: Poor adjustment as well as the
14 orthodontic effect. The jaw is held forward for six to
15 seven hours a night, every night, for the rest of your life.

16 DR. GENCO: Orthodontic effect and/or poor
17 adjustment.

18 DR. CLARK: Yes; both.

19 DR. GENCO: I think we have covered them all.

20 DR. CLARK: If the appliance were used in a
21 growing or mixed dentition or still-developing dentition, it
22 would impede normal orthodontic eruptive processes as well.

23 DR. GENCO: So the oral obstruction is obviously
24 the lack of slot or airspace. And then e) would be

1 interference with normal orthodontic eruptive process--that
2 is another specific hazard to health.

3 DR. CLARK: If it were used in a pre-fully-
4 developed dentition.

5 DR. GENCO: But we are saying it shouldn't be.

6 DR. CLARK: Well, somebody might unless you
7 exclusively--

8 DR. GENCO: What is the feature of the device that
9 does that?

10 DR. CLARK: Oh; it captures the teeth where they
11 are, and they need to move. It impedes normal development
12 and growth because it is a rigid, fixed appliance.

13 DR. GENCO: The rigidity of the appliance, the
14 rigid, fixed nature of the appliance.

15 DR. HEFFEZ: I am not so sure if it is only the
16 rigidity of the appliance that is impeding normal growth.
17 It does other things, too. The patient may develop a
18 certain habit from use of the appliance. It is hard to
19 pinpoint exactly the reason why or how it will influence
20 vectors of growth.

21 DR. GENCO: So the normal orthodontic eruption
22 process is interfered with by the rigid, fixed nature of the
23 appliance, habit or abnormal use associated with the
24 appliance.

1 We have recommended, go to 6, classified as II.
2 What about the priority. The priority here is low, medium,
3 high? Is there something like urgent? Low priority, medium
4 priority--

5 MS. ROSECRANS: You don't need that because we
6 don't have performance standards. We didn't recommend that.

7 DR. GENCO: Okay; so there is no priority.

8 MS. SCOTT: Dr. Genco, at this point, would it be
9 appropriate to actually take the vote or would you prefer to
10 complete--

11 DR. GENCO: Why don't we complete this. That is
12 not applicable? No. 7; if the device is an implant or is
13 life-sustaining or life-supporting and has been classified
14 in other than class III, explain why. That is irrelevant,
15 then. That is not applicable because it is neither life-
16 sustaining or life-supporting.

17 DR. SHIRE: And it is not an implant.

18 DR. GENCO: And it is not class III. So that is
19 not applicable. Number 8; a summary of information
20 including clinical experience or judgment upon which a
21 classification recommendation is based. That is what we
22 have been talking about for the last six or so hours. Can
23 we get that out of the unit?

24 DR. REKOW: I think that it is the chair's

1 prerogative to come up with that single statement, isn't it?

2 DR. GENCO: Do you want me to try?

3 DR. HEFFEZ: Can't we jump to the classification
4 without dealing with this?

5 MS. SCOTT: We need to compete the supplement
6 datasheet. But I believe in the past, the manner in which
7 panels have handled this, particularly if they have relied
8 on presentations made during the meeting, they have phrased
9 it in that way in addition to clinical knowledge and
10 information submitted to them by industry and/or FDA.

11 DR. GENCO: That sounds great. That is a great
12 summary, Pamela. You have done that before. Fine. Anybody
13 object to that? Seriously, based upon the information,
14 clinical experience and judgment; information we have
15 received, our clinical experience and judgment. This is how
16 we made this classification.

17 Indication of any needed restrictions on the use
18 of device. We have that list.

19 MS. ROSECRANS: That is the same as the question
20 we addressed on the previous one. So you can refer to 11,
21 where we were discussing training, specific training.

22 DR. GENCO: That would be question 4. 10 is
23 irrelevant. 11; existing standards applicable to the
24 device, device subassemblies or device materials. Are these

1 the ISO standards? But there are none for this set of
2 devices. Are there any standards?

3 DR. RUNNER: You might mention materials, any
4 appropriate material standards.

5 DR. GENCO: So you already have those that you
6 have judged the 510(k)s against. Let's take a vote, then.
7 Is this the time to take a vote?

8 I would like to announce that Drs. Diane Rekow,
9 Andrea Morgan, James Drummond and Leslie Heffez are
10 appointed as voting members of the Dental Products Panel for
11 this panel meeting on November 4 and 5, 1997. For the
12 record, these people are special government employees and
13 are consultants to this panel under the Medical Devices
14 Advisory Committee.

15 They have undergone customary conflict of interest
16 review. They have reviewed the material to be considered at
17 this meeting. This comes from Dr. Bruce Burlington,
18 Director, Center for Devices and Radiologic Health date
19 October 28, 1997.

20 So, there are those four, Drs. Rekow, Morgan,
21 Drummond and Heffez. Drs. Janosky, Stephens, Altman--no?
22 Myself; do I vote? Not unless there is a tie. So let's
23 start, then.

24 DR. ALTMAN: I have one question before we vote.

1 We went through this and we did all three groups. Did we
2 not want to put special clinical trials on palatal lifters
3 or we are expecting the same thing for all three groups? Is
4 that what we are doing? Is that what you are voting on?

5 DR. GENCO: That is after we take this vote, then
6 we will discuss the experiments. Are there any further
7 comments or questions or any discussion that the consumer or
8 industry representatives want to make before we take the
9 vote?

10 MR. HEZLEP: Robert Hezlep from EPM. I have got
11 one question, or one thing I would like to get clarified.
12 In the discussion of separating snoring versus obstructive
13 sleep apnea, I know that you want recommendations after this
14 classification issue, but I thought I understood that in the
15 questions that were answered, that it was recommended that
16 these devices needed to be used with specialists. Is that
17 true, that they would be used under the tutelage of
18 specialists, physicians, dentists. Was that something in
19 the questions that you just--

20 DR. GENCO: For this classification, this
21 categorization, yes.

22 MR. HEZLEP: Then this categorization would
23 eliminate the potential for over-the-counter. If that is
24 the case, then should that not be backed up because over-

1 the-counter would not allow that aspect of removing it from
2 the specialist. So can you reconsider that aspect or take
3 an understanding of that aspect?

4 MS. ROSECRANS: Do you want me to answer that?

5 DR. GENCO: Yes; please do.

6 MS. ROSECRANS: Again, we are not aware of these
7 devices being marketed over-the-counter prior to May 28,
8 1976. When we have received 510(k) submissions for the
9 over-the-counter use, we have found them not-substantially
10 equivalent for that use and require premarket approval.

11 At any time, any person can come with a
12 reclassification petition for over-the-counter use and
13 provide new information and their evidence to show why they
14 believe the device does not need the premarket approval
15 level of regulatory control. So that would be the method to
16 come back.

17
18 But what we are classifying now is what we know
19 existed.

20 MR. HEZLEP: So it would take, then, a
21 reclassification to go over-the-counter. Is that what I just
22 heard you say?

23 MS. ROSECRANS: Yes; it is. But we are still
24 asking for their opinions on the over-the-counter use after

1 we finish the classification discussion.

2 MR. HEZLEP: Okay. So, for an existing product, a
3 reclassification petition that you would then review and
4 that would step outside of the concern I just had.

5 MS. ROSECRANS: For the devices that we have seen,
6 these intraoral devices to date, 510(k) is a classification
7 process. Individually, we classified the devices we have
8 seen to date for over-the-counter use as requiring premarket
9 approval.

10 DR. GENCO: Any further comments or questions?
11 The issue is the classification recommendation for removable
12 intraoral devices for snoring and sleep apnea. Does anyone
13 want to make a motion for a classification recommendation?

14 DR. HEFFEZ: I move that it be class II.

15 DR. GENCO: It is moved that it be class II. Is
16 there a second to that?

17 DR. MORGAN: I second that.

18 MS. SCOTT: Could we have the panel member who
19 made the motion and also the consultant who seconded it
20 state their names for the record.

21 DR. HEFFEZ: The motion was made by Dr. Leslie
22 Heffez.

23 DR. MORGAN: I seconded the motion. I am Dr.
24 Andrea Morgan.

1 DR. GENCO: Let's go around the table. Dr.
2 Drummond, what is your vote?

3 DR. DRUMMOND: I would vote yes on the motion for
4 class II based on the information and discussion we have had
5 this morning.

6 DR. STEPHENS: I would recommend class II.

7 DR. MORGAN: I would also vote for class II.

8 DR. JANOSKY: I also would recommend class II.

9 DR. HEFFEZ: Class II.

10 DR. REKOW: I concur.

11 DR. GENCO: It was unanimous, then. Thank you.

12 Now we have at least two other issues. One is the
13 issue of the matrix of snoring and sleep apnea and the
14 recommendations for guidances, and then should there be
15 distinct discussion of the three subclasses.

16 Let's go first to the snoring and sleep apnea.
17 What would you like to see in terms of the guidances for
18 proof of efficacy, safety for snoring indications? Does
19 anybody want to start that discussion? Recommendations or
20 suggestions?

21 DR. CLARK: I would suggest if a manufacturer
22 wants to make a claim that a device works on snoring, they
23 actually should measure snoring in a population of patients
24 and it probably ought to be measured at multiple time points

1 because there is a clear first-month phenomenon of an
2 appliance until you habituate to it and then it tends to
3 diminish its effect later on.

4 So I would like to see at least two times points
5 three months apart in the follow up. I don't think you need
6 full polysomnographic studies to deal with snoring but you
7 probably do need oximetry because if you have oximetry and
8 it is flat, you have no change in oxygen saturation level,
9 then you know you don't have substantial desaturations, you
10 don't have substantial apneic events.

11 It doesn't deal with arousals and stuff like that
12 but that can probably be dealt with by questionnaire. So,
13 if I were to do a snoring study, I would get a throat mike.
14 I would get an oximeter and I would get a good sleepiness
15 questionnaire diary history. And I would want at least two
16 post-treatment time points, initial and then three months
17 later.

18 I would want a prospective study tracking everyone
19 to know how many people quit using the device. If I saw
20 that and it was good, I would say great, go for it over-the-
21 counter.

22 DR. GENCO: So this is a randomized, controlled
23 trial, I take it, with a placebo arm and a treatment arm, a
24 device arm. Is there any such thing as a placebo device?

1 DR. CLARK: No. Unfortunately, there can't be.
2 You could have a control condition but I would like to see
3 the data actually scored by someone who is blind to the
4 status.

5 DR. GENCO: But what would the control be?

6 DR. CLARK: You could do a couple of things. You
7 could do one device against another and that has never been
8 done because manufacturers generally don't want to compare
9 one against another in case they lose. But the alternative
10 could be some of the non-treatment effects, the nasal strips
11 and stuff like that, that really have very poor treatment
12 results.

13 Or you could simply do no treatment to see if
14 there is variability over time.

15 DR. GENCO: Some reasonable control group to be
16 compared--

17 DR. CLARK: The key is scoring the data blind to
18 treatment status because it is a highly subjective thing to
19 score an oximeter strip. People score it very differently.

20 DR. GENCO: So all the principles of good
21 randomized controlled trials that are masked, double-masked
22 if possible. That is impossible, probably, with wearing an
23 appliance.

24 DR. CLARK: The scoring side can be blind.

1 DR. HEFFEZ: You could use a placebo device,
2 though. You could use a placebo appliance that doesn't--

3 DR. CLARK: You could, yes, absolutely. There are
4 a variety of controls you could come up with and that has
5 been done.

6 DR. GENCO: I think what will happen is there will
7 be some guidances. You will have a committee working on
8 this or a group or you will work on these with that kind of
9 detail. I think you just want outlines. You have heard
10 controls are necessary.

11 You have heard measurement of snoring with a mike.
12 You have heard measurement of oxygen levels with an
13 oximeter.

14 DR. HENDLER: Oximetry is a very simplistic way of
15 measuring oxygen saturation. It is reliable. It is an
16 excellent suggestion.

17 DR. CLARK: And a sleepiness questionnaire.

18 MR. LARSON: Is the question on the table the need
19 for clinical data to justify the marketing on an over-the-
20 counter basis--

21 DR. GENCO: No; it is for the device that we have
22 reclassified.

23 MR. LARSON: Okay. Including for sleep apnea.

24 DR. GENCO: No; only for snoring. This is the

1 category II device by prescription and only for snoring.

2 MR. LARSON: Then I ask what are the consequences
3 of ineffectiveness in a device that is intended only for
4 snoring? What are the risks, in terms of ineffectiveness?
5 Are we not talking truth in advertising rather than a
6 medical issue?

7 DR. GENCO: We have got a list of a randomized,
8 controlled trial. You are challenging whether that is
9 needed at all for the snoring claim under the class II--

10 DR. SHIRE: Up until now, we haven't required
11 clinical data for the claim of snoring, but we have
12 requested data to support the claim for obstructive sleep
13 apnea.

14 MR. LARSON: Exactly.

15 DR. SHIRE: So new products that are substantially
16 equivalent in design and intended use to those that are
17 currently marketed even though, up until today, they have
18 been unclassified, can come to market with a snoring claim.

19 MR. LARSON: And I am suggesting that maybe those
20 snoring claims are not justified claims. But we have got to
21 consider what the risk of ineffectiveness is.

22 DR. GENCO: We are just hearing some suggestions
23 and I want to formulate that and then the panel will discuss
24 it and determine where to go with it. But that is a very

1 interesting perspective.

2 MR. LARSON: The other suggestion I have is,
3 because the issue has come up, how many people snore with
4 apnea is take a population of snorers and run oximetry, take
5 200 snorers that show up from your ad and run oximetry
6 studies on them to see how many of them have desaturations
7 because you will, then, have a first clue as to how many of
8 them have apnea.

9 And you can see the percent of the population that
10 has apnea with snoring.

11 DR. GENCO: So you would have some beneficial
12 effects of carrying out the study. But this is not basic
13 science. This is not the NIH. This is the FDA and we are
14 talking about commerce.

15 DR. CLARK: My mind set is on the other side.

16 DR. GENCO: Oh; I understand. So is mine, but not
17 today. What are your feelings, panel, about the requirement
18 for this rigorous clinical trial for a snoring claim made
19 under the context of a prescription device, class II?

20 DR. FURST: It seems to me that if a company is
21 producing an oral device for snoring and claims that that
22 device is efficacious for snoring, and wants FDA approval
23 for that device for snoring, it is unthinkable to me that
24 you would give approval for such a device without some

1 evidence that it works.

2 I know it hasn't been the case up until now but,
3 for example, LAUP for snoring, laser-assisted
4 uvulopalatoplasty, the data had to be scrutinized for quite
5 a length of time before it was approved, that procedure for
6 snoring--for snoring, not for sleep apnea.

7 DR. GENCO: That is a surgical procedure. We are
8 talking about a removable device.

9 DR. FURST: Understood. But, still, if somebody
10 wants approval for marketing and they are going to advertise
11 this device for snoring, shouldn't there be some evidence
12 that the thing works?

13 DR. REKOW: I think that there is enough concern
14 in my mind about things that could create a problem that, if
15 there is no benefit, then I would have trouble justifying
16 the risks.

17 DR. GENCO: Interesting perspective.

18 DR. STEPHENS: It seems to me we have to have some
19 studies for it. I don't think that we can approve a device
20 for market that may, in fact, have no benefit. I think we
21 need to know what we are proving.

22 DR. CLARK: And some consequences.

23 DR. GENCO: Does anybody disagree with that?

24 DR. SHIRE: Sometimes we do rely on the published

1 literature that has demonstrated that the increased airway
2 patency has provided some benefit to patients and can use
3 those studies in support of the design features that are
4 presented and the devices that are presented to us. We
5 clear them based on their design and materials and so on.

6 DR. HEFFEZ: Let me ask the question. Is it
7 possible that we use these appliances for sleep apnea in the
8 patient that does snore and that we improve the sleep apnea
9 and the snoring does not improve?

10 DR. CLARK: Yes.

11 DR. HEFFEZ: In what percentage of cases would you
12 say that if you continue to use the appliance, the snoring
13 is unaffected, and the sleep apnea is improved?

14 DR. CLARK: It has to be anecdotal because no one
15 has measured snoring in an objective fashion, pre and post.
16 Until they do that, you don't know. But my anecdotal
17 response to that is about 50 percent of the patients who you
18 make the appliances for do not have a substantial--or have a
19 brief, maybe two-month decrease in their snoring, and then
20 the snoring returns.

21 You can break the apnea, which is the full closure
22 of the airway, but you still have a narrow airway when they
23 snore, so you can take someone who has apnea and snoring and
24 turn him into a snorer only, or partial apnea with snoring.

1 That happens all the time.

2 DR. GENCO: So your point is there is some great
3 beneficial effect, so you would like to what, see both
4 tested for?

5 DR. HEFFEZ: I think it makes sense, yes; both of
6 them should be tested for.

7 DR. GENCO: Even if you make a snoring claim?

8 DR. HEFFEZ: It would have made it a lot easier if
9 you told me that the appliance, in all cases, when it
10 improved the sleep apnea, it relieved the snoring because
11 then I would say no, there is no reason to test the snoring
12 because, regardless, it would have been--but you are telling
13 me, then, in 50 percent of the cases, the snoring--so,
14 basically, yes, I would say yes, you do need testing for
15 snoring if you are want to put the claim for snoring.

16 DR. HENDLER: I have found, again, in my
17 experience, a little lower percentage than that. But there
18 are patients who get apnea improved but they still have
19 sounds that persist.

20 DR. STEPHENS: It is also a problem, it is not
21 really the two groups are not clearly equivalent. We don't
22 know where those groups would split out. We may be
23 inadvertently treating both of them.

24 DR. HENDLER: Exactly.

1 DR. STEPHENS: So it seems to me that, at this
2 point, we have to have studies for both groups.

3 DR. HENDLER: That is exactly the point. To make
4 a statement that you can identify a pure snorer every single
5 time with real reasonable certainty and go ahead and treat
6 them with no possibility of side effects or harm needs to be
7 proven.

8 DR. STEPHENS: Also we are not sure how to
9 identify the groups without sleep studies. And we are
10 treating a lot of patients without sleep studies. We have
11 to have studies.

12 DR. SHIRE: The reminder here, also, that we do
13 review the products and we are relying on a learned
14 intermediary in these products because they have all been
15 cleared for prescription use. So we are reviewing the
16 products, not the way the practitioner chooses to use them,
17 or not the choice that the practitioner makes to use them
18 versus another modality of treatment.

19 DR. GENCO: Is there anybody recommended that the
20 studies not be done? I hear your point, and the point is
21 that there is a precedent for these devices working. If
22 somebody comes along with another device that looks almost
23 identical to a device that has been shown to work and known
24 to work for years, why do another set of studies?

1 DR. SHIRE: We are always happy to see studies.
2 But, as far as requiring them for a snoring claim, and I
3 appreciate what you are saying about the continuum of
4 disease, but, like you say, it is not the NIH. We are
5 looking for scientific data on which to make our decisions.
6 However, we do have a body of devices that are out there
7 that are currently legally marketed and the new ones have to
8 be found equivalent to them.

9 DR. GENCO: I think you have the sense of the
10 group. I don't know if you have changed their minds.

11 Has she? With respect to sleep apnea, obstructive
12 sleep apnea, what sorts of studies, if any, would you like
13 to see for that? Maybe our advisors could give us some
14 advice first and then we could proceed.

15 DR. STEPHENS: May I ask one question? What are
16 we going to use as the cutoff definition for sleep apnea for
17 this discussion?

18 DR. FURST: I think I can answer that. Certainly,
19 the standards for mild, moderate, severe and profound sleep
20 apnea, I think most people who work in this field agree that
21 0 to 4--I am talking about the RDI now--0 to 4 events per
22 hour are basically considered normal or not sleep apnea.

23 5 to 19 is mild. 20 to 39 is moderate. 40 to 59
24 is severe. 60 and above is profound. I heard somebody from

1 industry saying that 30 and above was considered
2 significant. But I have seen patients who desaturate down
3 into the 50's with sleep apnea scores under 20 with very
4 significant medical consequences from their sleep apnea.

5 I have seen people who have been in near-fatal car
6 wrecks with very low sleep apnea scores. So I think this
7 has been mulled over for many, many years by many experts
8 and I think that it useful to stick to those definitions
9 that have been used for many years.

10 DR. STEPHENS: We are going to talk about patients
11 who have been studied here as our starting point.

12 DR. HENDLER: I guess that you think that most
13 people consider RDIs above 5 to indicate that somebody has
14 sleep apnea. Then you get into mild-moderate, moderate-
15 severe. You can separate it out all you want.

16 DR. GENCO: So what is your recommendation, what
17 is your suggestion?

18 DR. HENDLER: We talked about how much data there
19 is out there and how many patients have actually been
20 studied. We need more randomized, controlled studies.

21 DR. GENCO: For approval of a device, class II,
22 which makes the claim of sleep apnea. That is the issue.

23 DR. HENDLER: No.

24 DR. GENCO: We don't need the studies?

1 DR. HENDLER: I think there are studies there that
2 show that it works. Do we need better studies? Yes; I
3 think that would be helpful.

4 DR. GENCO: The issue is if a company comes to the
5 FDA with a new device that looks like an existing device, is
6 there a new study needed?

7 DR. HENDLER: I wouldn't think so.

8 DR. CLARK: Can you clarify that question? Are
9 you saying that if a new device comes to market for a 510(k)
10 approval, do they have to present data? My answer would be
11 absolutely because they could come with something that
12 doesn't make sense.

13 DR. GENCO: The types of devices that they have
14 already seen, reasonably comparable to the types they have
15 already seen.

16 DR. HENDLER: Despite the fact that there have
17 been a lot of different designs of mandibular repositioners,
18 for example, maybe 20, 30, 40 different designs, all of the
19 data that has come from all of them basically have been
20 about the same, and that is 50 percent reduction in the RDI
21 across the board.

22 So, as a category, if somebody presented a
23 mandibular-positioning device, I wouldn't think that they
24 would have to supply separate data to use that device. Now,

1 if they had a different modality, I think that is a
2 different issue.

3 DR. GENCO: So are you agreeing with that?

4 DR. CLARK: I would agree with that. But the
5 question is what does a substantially similar device mean?

6 DR. GENCO: That is up to them.

7 DR. RUNNER: I just want to clarify what you are
8 recommending is exactly the opposite of what we do now. At
9 this point, for snoring devices, we require no clinical data
10 but demonstration that they are substantially equivalent to
11 other devices that require snoring.

12 For devices that want the claim of obstructive
13 sleep apnea, we require some clinical data with the use of
14 that device with a comparative sleep study. So you are
15 recommending exactly the opposite, that we require some
16 clinical data to prove effectiveness in snoring and no
17 clinical data for the OSA claim?

18 DR. FURST: I would have to say that I would
19 disagree with that approach. I think that anybody who
20 claims their device is going to impact on sleep apnea--
21 studies are not that complicated nor are they that expensive
22 and they are not going over that long a period of time.

23 I don't think it is a big thing to ask that. If
24 one device looks like another device, does it really do what

1 the other device does? Is it really identical or is it
2 different, and are they claiming to be different or better
3 than anybody else.

4 That being the case, anybody could take a device
5 and copy it and call it their own device and railroad it
6 through the FDA for approval. But it may not be the same;
7 maybe not. I don't know. I think it is such an important
8 issue that if you are going to approve it for sleep apnea, I
9 think there should be some data to at least show that it
10 works.

11 DR. SHIRE: That is consistent with the way we
12 review the products.

13 DR. GENCO: What does the panel think? You have
14 heard these opinions.

15 DR. HENDLER: I certainly wouldn't object to
16 studies for both. I think that is not going to hurt.

17 DR. HEFFEZ: I have stated my opinion. I think
18 you need to do studies for both.

19 DR. GENCO: Using the appropriate outcomes. Any
20 objection to that or does anybody disagree with Leslie's
21 suggestion? So, I think the panel view is studies for both.
22 Of course, the principles of the studies would be reasonable
23 outcomes, blinded, reasonable controls, power calculations
24 so that they are sufficient numbers in each group so that

1 you can make statistical inferences.

2 There was another issue you wanted us to address?

3 DR. HEFFEZ: May I say one thing? I think most of
4 the confusion today has been whether we consider snoring as
5 a condition or we consider it as a symptom. If we consider
6 it a symptom, I don't know if the title of our device--
7 snoring, whether it be a condition or whether it be a
8 symptom.

9 It seems to me that when we are talking about the
10 intraoral appliances for snoring and sleep apnea, by using
11 that title, then we are considering two separate conditions
12 because snoring is only a symptom of sleep apnea. So I am
13 just making that point out loud because I think it was
14 confusing during the meeting.

15 DR. GENCO: Okay; thank you.

16 MS. SCOTT: If the panel has completed their
17 comments or recommendations regarding this point, then we
18 can go back to asking the panel to state their opinion
19 regarding over-the-counter use of these devices versus
20 prescription use of these devices. I would just like to
21 clarify, in case it wasn't clear to the panel, that in terms
22 of preamendments use, we are not aware of these devices
23 being marketed over-the-counter, as Heather has previously
24 stated.

1 Those devices that are marketed for prescription
2 use have been cleared for prescription use. Any devices
3 that are marketed or sold over-the-counter are presently
4 sold illegally if they are sold that way.

5 MS. ROSECRANS: Could I add one more thing to
6 that, Pam? As we have said previously, we don't have a
7 reclassification petition before us to formally ask any type
8 of recommendation from you but, because it is on that list,
9 we will address it, as Pam says, as an opinion.

10 DR. GENCO: I have a suggestion. Just to get
11 things going, with respect to the panel, how about a straw
12 vote about do you think it is reasonable to consider over-
13 the-counter at all, or not, obviously, with all the controls
14 that are possible through the FDA's regulation.

15 Is that a reasonable thing to do? It's not a
16 vote. Just go around the table. Leslie, do you want to
17 start off?

18 DR. HEFFEZ: My opinion is that the appliances for
19 snoring could be sold over-the-counter with special labeling
20 and provided they demonstrated their efficacy in a study, a
21 clinical study.

22 DR. GENCO: My opinion, also, is this should be
23 looked into. I think there is a possibility that this could
24 actually be useful.

1 DR. MORGAN: My only concern with that would be
2 that, Leslie just talked about snoring being a symptom of
3 obstructive sleep apnea. If you sell a product over-the-
4 counter for snoring, but that is only a symptom of a larger
5 problem, I am not sure if the larger problem ever gets
6 addressed. That would be my biggest concern with selling it
7 over-the-counter because then the patient feels there is a
8 cure-all for a situation that is never addressed. That is
9 my big concern.

10 DR. STEPHENS: I think that there are a lot of
11 concerns about this product as an over-the-counter device,
12 but I think that it should be considered and looked into.

13 DR. DRUMMOND: I think if we got the studies and
14 efficacy proven, I would probably have to consider it for
15 over-the-counter.

16 DR. FURST: I agree that, with the proper studies
17 and labeled for snoring only, that it is appropriate.

18 DR. GENCO: Don has left.

19 DR. FURST: One thought I would like to throw in,
20 if I may. Recently, a medication, Wellbutrin, was approved
21 by FDA for smoking cessation under the name of Zocor, I
22 believe. Part of the deal that they made with FDA was that
23 they provided backup support with a phone-in, an 800 number,
24 that people could phone in and get some basic advice about

1 cessation of smoking and what their product does, and so on.

2 That might be a consideration that, if this does
3 go over-the-counter, that such a service by the company that
4 manufacturers it be made available at certain times where a
5 patient could call in and say, "What do you mean? What is
6 this sleep apnea thing? This is what happens to me? Should
7 I see my doctor?" Not medical advice, but somebody who can
8 give them a little bit of counseling, a little bit of
9 guidance as to what they should do.

10 Again, that would make me feel a little more
11 comfortable about having it over-the-counter.

12 DR. GENCO: So you are suggesting that if a
13 company does think along these lines, they should provide
14 such backup service.

15 DR. FURST: Some backup support, a number that a
16 patient could call during normal business hours. There
17 should be somebody there who is trained to answer basic
18 questions and to give feedback to patients regarding whether
19 they should get further follow up. I think that would be
20 very useful.

21 DR. GENCO: Any other comments?

22 DR. HENDLER: When is the last time you read a
23 package insert?

24 DR. GENCO: I read them all the time.

1 DR. HENDLER: Do you?

2 DR. GENCO: But I am not the average consumer,
3 obviously.

4 DR. HENDLER: That's right.

5 DR. GENCO: Obviously, consumer research would
6 have to be done. I have seen some consumer research and I
7 know that, for dentistry, people get a lot of their
8 information from the dentist. So I would be concerned about
9 the package inserts, just as you are. But maybe there is a
10 novel way of doing this. Maybe that could be a dentist at
11 the phone that the company hires, or a series of dentists.

12 I think, based upon some reasonable consumer
13 research, that this could probably be done.

14 DR. CLARK: My last comment is I really don't
15 object to over-the-counter use of the dental appliances
16 providing I saw data on two things; one, they would be
17 primarily marketed for snoring. I would actually like to
18 see some data on how effective they are at doing that.

19 Secondly, I would like to see some long-term data
20 on tooth movement. It is the single consequence that
21 patients can't throw the appliance in the trash and make it
22 go away. It is a long-term change and it may cost thousands
23 of dollars to put your teeth back where they were.

24 So I would like to see some actual measurement of

1 tooth movement over time. I am talking, unfortunately, four
2 or five years. That is going to kill over-the-counter
3 applications if that is done, but that is what ought to be
4 done because of the history of these appliances moving teeth
5 in the orthodontic world.

6 DR. GENCO: I think those comments are valuable.
7 I would never underestimate or overestimate what can happen
8 in commerce. It may make sense from a business standpoint
9 to do such and such.

10 DR. CLARK: Sure; there is a \$2 billion market out
11 there.

12 DR. GENCO: Further comments or questions with
13 respect to this issue? Any other comments or discussion,
14 items or questions?

15 DR. SHIRE: Thank you, Dr. Genco. That was very
16 helpful.

17 DR. GENCO: I think we are finished, then. I
18 would like to thank, first of all, Pam. She has done a
19 magnificent job, again, of getting this very complex three-
20 day meeting together. Susan, Sandra, and all of the other
21 FDA staff, you have been excellent.

22 Panel members, thank you very much. Our guests,
23 thank you. And the public, also, and industry
24 representatives.

1 MS. SCOTT: And ditto to everything that Dr. Genco
2 has said. We would like to thank Dr. Genco for sitting in
3 as our acting chair. I would like to thank all the panel
4 members. I would like to remind the panel, in reference to
5 the information that you received, the information that will
6 be continued to future panel meetings, please keep that
7 information.

8 The information regarding this issue, you may
9 either send back to FDA for us to discard or you may have it
10 shredded, yourself. Also, for those who may be interested,
11 our next scheduled tentative panel meeting dates are January
12 12, 13 and 14.

13 [Whereupon, at 1 o'clock p.m., the proceedings
14 were adjourned.]

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