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DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Food and Drug Administration

[Docket No. 00B-0108]

Microbiology Devices; Reclassification of Fully Automated Short-Term Incubation Cycle Antimicrobial Susceptibility Devices From Class III to Class II

AGENCY: Food and Drug Administration, HHS.

ACTION: Notice of panel recommendation.

SUMMARY: The Food and Drug Administration (FDA) is announcing for public comment the recommendation of the Microbiology Devices Panel (the Panel) to reclassify the fully automated short-term incubation cycle antimicrobial susceptibility devices from class III to class II. The Panel made this recommendation after reviewing the reclassification petition submitted by bioMérieux Vitek, Inc., and other publicly available information. FDA is also announcing for public comment its tentative findings on the Panel's recommendation. After considering any public comments on the Panel's recommendation and FDA's tentative findings, FDA will approve or deny the reclassification petition by order in the form of a letter to the petitioner. FDA's decision on the reclassification petition will be announced in the **Federal Register**. Elsewhere in this issue of the **Federal Register**, FDA is publishing a notice of availability of a guidance document that would serve as a special control for the reclassified device.

DATES: Submit written comments by [*insert date 90 days after date of publication in the Federal Register*].

ADDRESSES: Submit written comments to the Dockets Management Branch (HFA-305), Food and Drug Administration, 5630 Fishers Lane, rm. 1061, Rockville, MD 20852.

FOR FURTHER INFORMATION CONTACT: Joseph L. Hackett, Center for Devices and Radiological Health (HFZ-440), Food and Drug Administration, 9200 Corporate Blvd., Rockville, MD 20850, 301-594-3084.

SUPPLEMENTARY INFORMATION:

I. Background (Regulatory Authorities)

The Federal Food, Drug, and Cosmetic Act (the act) (21 U.S.C. 301 *et seq.*), as amended by the Medical Device Amendments of 1976 (the 1976 amendments) (Public Law 94-295), the Safe Medical Devices Act of 1990 (Public Law 101-629), and the FDA Modernization Act of 1997 (Public Law 105-115), established a comprehensive system for the regulation of medical devices intended for human use. Section 513 of the act (21 U.S.C. 360c) established three categories (classes) of devices, depending on the regulatory controls needed to provide reasonable assurance of their safety and effectiveness. The three categories of devices are class I (general controls), class II (special controls), and class III (premarket approval).

Under section 513 of the act, devices that were in commercial distribution before May 28, 1976 (the date of enactment of the 1976 amendments), generally referred to as preamendments devices, are classified after FDA has: (1) Received a recommendation from a device classification panel (an FDA advisory committee); (2) published the panel's recommendation for comment, along with a proposed regulation classifying the device; and (3) published a final regulation classifying the device. FDA has classified most preamendments devices under these procedures.

Devices that were not in commercial distribution prior to May 28, 1976, generally referred to as postamendments devices, are classified automatically by statute (section 513(f) of the act) into class III without any FDA rulemaking process. Those devices remain in class III and require premarket approval, unless and until the device is reclassified into class I or II or FDA issues an order finding the device to be substantially equivalent, under section 513(i) of the act, to a predicate device that does not require premarket approval. The agency determines whether new devices are substantially equivalent to previously offered devices by means of premarket

notification procedures in section 510(k) of the act (21 U.S.C. 360(k)) and 21 CFR part 807 of the regulations.

A preamendments device that has been classified into class III may be marketed, by means of premarket notification procedures, without submission of a premarket approval application until FDA issues a final regulation under section 515(b) of the act (21 U.S.C. 360e(b)) requiring premarket approval.

Reclassification of classified postamendments devices is governed by section 513(f)(2) of the act. This section provides that FDA may initiate the reclassification of a device classified into class III under section 513(f)(1) of the act, or the manufacturer or importer of a device may petition the Secretary of Health and Human Services (the Secretary) for the issuance of an order classifying the device in class I or class II. FDA's regulations in § 860.134 (21 CFR 860.134) set forth the procedures for the filing and review of a petition for reclassification of such class III devices. In order to change the classification of the device, it is necessary that the proposed new class have sufficient regulatory controls to provide reasonable assurance of the safety and effectiveness of the device for its intended use.

Under section 513(f)(2)(B)(i) of the act, the Secretary may, for good cause shown, refer a petition to a device classification panel. The Panel shall make a recommendation to the Secretary respecting approval or denial of the petition. Any such recommendation shall contain: (1) A summary of the reasons for the recommendation, (2) a summary of the data upon which the recommendation is based, and (3) an identification of the risks to health (if any) presented by the device with respect to which the petition was filed.

II. Regulatory History of the Device

The fully automated short-term incubation cycle antimicrobial susceptibility device intended for determining the susceptibility patterns of microorganisms to various antimicrobial agents is a postamendments device classified into class III under section 513(f)(1) of the act. Prior to 1976, antimicrobial susceptibility disks were regulated as drugs. In 1976, with the passage of the 1976

amendments, all antimicrobial susceptibility products were considered transitional devices and automatically classified into class III. In 1978, the Vitek system for antimicrobial susceptibility testing was approved. In 1980, the antimicrobial susceptibility test (AST) disks device and the AST powder device were classified into class II. The semi-automated and automated methodologies were subject to class III controls because they were not substantially equivalent to traditional antibiotic disks and powders. In 1983, FDA denied a petition requesting the AST disks devices to be reclassified into class I. In 1984, the semi-automated and automated AST methodologies were reclassified into class II. The petition did not address the fully automated short-term incubation cycle methodologies. On July 2, 1997, FDA received a petition from bioMérieux Vitek, Inc., requesting reclassification of the fully automated short-term incubation cycle antimicrobial susceptibility devices from class III to class II under section 513(f)(2) of the act and § 860.134, based on information submitted in the petition.

Consistent with the act and the regulation, FDA referred the petition to the Panel for its recommendation on the requested change in classification.

III. Device Description

The fully automated short-term incubation cycle antimicrobial susceptibility device is intended to determine, in less than 16 hours, the antimicrobial susceptibility of nonfastidious aerobic and/or facultative anaerobic bacteria to FDA-approved antimicrobial agents. These devices are based on optical detection of growth of bacterial isolates in media with selected antimicrobial concentrations during a short term, less than 16 hours, incubation cycle. Test results are used as an aid for the physician in making therapeutic decisions involving the administration of antimicrobial drugs.

IV. Recommendations of the Panel

At a public meeting on February 13, 1998, the Panel unanimously recommended that the fully automated short-term incubation cycle antimicrobial susceptibility devices be reclassified from

class III to class II. The Panel believes that class II with special controls would provide reasonable assurance of the safety and effectiveness of the device. Those special controls include: (1) The use of updated and appropriate “challenge strains,” (2) the use of a nephelometer for preparing the inoculum, (3) application of “acceptable error” as a range with confidence intervals, (4) identification of a predicate device for comparative clinical performance testing, and (5) guidelines in the FDA guidance document entitled “Review Criteria for Assessment of Antimicrobial Susceptibility Devices.” In addition, the Panel believes there is the need for a postmarketing action plan, which the Panel called “postmarket surveillance,” to review problems as they arise. (See further discussion under section IX of this document).

The Panel stated that special controls will diminish some of the risks associated with the inappropriate use of antimicrobial agents, including the potential risk of death associated with an ineffective antimicrobial agent.

V. Risks to Health

After considering the information discussed by the Panel during the meeting on February 13, 1998, the published literature, and the Medical Device Reporting (MDR) system reports, FDA believes the following risks are associated with the use of fully automated short-term incubation cycle antimicrobial susceptibility devices.

When an antimicrobial agent result is erroneously reported to the clinician as “sensitive” and in reality is “resistant,” the patient may be treated inappropriately and inadvertently subjected to an exacerbation of the infection, drug reaction, an extended hospital stay, collateral infections, or possibly death.

When an antimicrobial agent result is erroneously reported to the clinician as “resistant” and in reality is “sensitive,” the appropriate treatment may be delayed with a similar potential of severe sequelae.

VI. Summary of Reasons for Recommendation

Based on the Panel members' personal knowledge and clinical experience with the device, the data and information contained in the petition, the information provided by FDA, and the open discussions during the Panel meeting, the following reasons were given by the Panel in support of its recommendation to reclassify the fully automated short-term incubation cycle antimicrobial susceptibility device for use in the rapid determination of the in vitro susceptibility of nonfastidious aerobic and facultative anaerobic organisms to antimicrobial agents from class III into class II:

1. The safety and effectiveness of the fully automated short-term incubation cycle antimicrobial susceptibility device has become well-established since approval of the first device in 1978.

2. The establishment of special controls, in addition to general controls, provides reasonable assurance of the safety and effectiveness of the fully automated short-term incubation cycle antimicrobial susceptibility device.

3. The rate of serious complications from the fully automated short-term incubation cycle antimicrobial susceptibility device is low and can be effectively minimized by: (a) Evaluating the system with updated challenge strains of organisms, as well as those organisms that are appropriate to the antimicrobial being tested; (b) using a nephelometer for preparing the inoculum; (c) using application of "acceptable error" as a range with confidence intervals; (d) conducting adequate and appropriate clinical testing; and (e) enforcing labeling restrictions and ensuring adherence to the guidelines described in the FDA guidance document entitled "Review Criteria for Assessment of Antimicrobial Susceptibility Devices."

The Panel has identified the risks to health regarding the use of the fully automated short-term incubation cycle AST system as the reporting of erroneous results. Insufficient testing of each unique antimicrobial agent with an inappropriate clinical and challenge organism, the use of an uncalibrated inoculum, or a nonstandardized acceptable error endpoint can result in such erroneous reports.

The Panel believes that the fully automated short-term incubation cycle AST device should be reclassified into class II because special controls provide reasonable assurance of the safety and effectiveness of the device, and there is sufficient information to establish special controls to provide such assurance.

VII. Summary of Data Upon Which the Panel Recommendation is Based

Based on the information discussed by the Panel during the February 13, 1998, Panel meeting, the published literature, the information presented in the petition, and the literature searches done by FDA, the Panel believes that there is reasonable knowledge of the benefits of the device when used for the determination of antimicrobial susceptibilities. The fully automated short-term incubation cycle antimicrobial susceptibility device provides a more timely laboratory report and clinical intervention. The sooner the clinician has the results of susceptibility testing, providing controls are in place to minimize erroneous results, the sooner the patient can be placed on appropriate therapy, thereby increasing the probability of faster recovery.

Automated antimicrobial susceptibility devices have been in the marketplace over 25 years. There is significant scientific and medical information available regarding the nature, complexity, and problems associated with these devices. With the short-term incubation cycle devices, the error rate tends to be higher because of decreased incubation times and the use of algorithms to determine resistance. Because of this, the results can more profoundly affect the clinical decision. This occurs frequently with certain organisms *pneumoniae*, and specific antimicrobial agent-bacterial pathogen combinations.

FDA believes that the special controls discussed in section VIII of this document are capable of providing reasonable assurance of the safety and effectiveness of the fully automated short-term incubation cycle antimicrobial susceptibility device with regard to the identified risks to health with the use of this device.

VIII. Special Controls

In addition to general controls, FDA believes that a special control should be established to minimize the risks to health identified with the use of this device. The special control will be an FDA guidance document as described below.

A. *FDA Guidance Document*

The FDA guidance document that would serve as a special control provides information to help manufacturers address the risks identified by the Panel. The guidance document describes a means by which fully automated short-term incubation cycle antimicrobial susceptibility devices may comply with the requirement of special controls for class II devices. Designation of this guidance document as a special control means that manufacturers attempting to establish that their device is substantially equivalent to a predicate device must demonstrate that the proposed device complies with either the specific recommendations of this guidance or some alternative control that provides equivalent assurances of safety and effectiveness. Fully automated short-term incubation cycle antimicrobial susceptibility devices remain subject to premarket approval unless and until reclassified by FDA.

Adherence to the revised FDA guidance document entitled “Review Criteria for Assessment of Antimicrobial Susceptibility Devices” (Ref. 1) can control the risks associated with inappropriate challenge strains being used in clinical testing, nonstandardized preparation of inoculum, varying interpretations of error ranges, and clinical performance testing. Each of these risks is addressed in the guidance document.

1. Appropriate Challenge Strains

Inappropriate testing, too few samples, and lack of attention to the specific antimicrobial/organism relationships that were approved by the Center for Drug Evaluation and Research, should be avoided. In the process of doing preclinical and clinical studies, testing of the device with

well-characterized strains may detect possible areas where the device needs improvement, as well as providing a greater confidence in the reporting of results with the use of the device.

2. Standardized Preparation of Inoculum

An acknowledged source of error in all systems is the use of an inappropriate inoculum. If the inoculum density falls outside of the established range, the results may provide inaccurate reports of “sensitive” or “resistant.” The use of a nephelometer alleviates visual acuity and ambiguity in determining a specific turbidity endpoint. As discussed in the guidance, the National Committee for Clinical Laboratory Standards (NCCLS) *Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically* (M7–A4), recommends use of a nephelometer as an option for preparing the inoculum.

3. Application of “Acceptable Error” as a Range With Confidence Intervals

By using an acknowledged standard (e.g., 95 percent confidence intervals for agreement and error rates that must fall within specified bounds), a consistent threshold can be universally applied.

4. Appropriate Clinical Performance Testing

FDA approves antimicrobial agents with specific indications for use. Many antimicrobial agents will show activity with only “selected” organisms. When manufacturers are performing clinical tests on their systems, it is essential to test only those organisms specifically identified in the “Indication for Use” statement of the approved drug. These are the organisms for which the clinician will require susceptibility results for treating the patient.

5. Reference to the Current Guidelines Established in Standards Published by the NCCLS

The quality of the device is enhanced by conforming to accepted standards. Standards listed in the FDA guidance document include the most recent version of *Performance Standards for Antimicrobial Disk Susceptibility Tests* (M2–A–), *Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria that Grow Aerobically* (M7–A–), *Development of In Vitro Susceptibility Criteria*

and Quality Control Parameters (M23-A-), and Performance Standards for Antimicrobial Susceptibility Testing (M100-A-).

IX. FDA's Tentative Findings

FDA agrees with the Panel's recommendation. However, FDA interprets the term, "postmarket surveillance," as used by the Panel, to mean continuation of the industry-wide activity already in place to review any problems with these devices as they develop. Many laboratories participate in various recognized surveys, which are widely subscribed to and sent out regularly. The results of these surveys are reviewed, tabulated, often listed by device, and published. For example, the College of American Pathology provides an extensive survey program. The Centers for Disease Control and Prevention do periodic testing to evaluate potential problems with susceptibility testing and disseminate the results of that research. There is also the Med-Watch program as well as the Medical Device Reporting system to identify problems or trends associated with these devices. The agency believes the above survey, testing, and reporting programs provide adequate postmarket surveillance. The development of an FDA guidance as a special control will minimize the major sources of erroneous reporting associated with the fully automated short-term incubation cycle antimicrobial susceptibility device. Because special controls, in addition to general controls, would provide reasonable assurance of safety and effectiveness, the device should be classified into class II. There is sufficient information to establish special controls to provide such assurance.

X. References

The following references have been placed on display in the Dockets Management Branch (address above) and may be seen by interested persons between 9 a.m. and 4 p.m., Monday through Friday:

1. FDA Guidance Document, "Review Criteria for Assessment of Antimicrobial Susceptibility Devices," 2000 revision.

2. NCCLS Approved Standard, M2 (most recent approved supplement), *Performance Standards for Antimicrobial Disk Susceptibility Tests*, Wayne, PA.
3. NCCLS Approved Standard, M7 (most recent approved supplement), *Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically*, Wayne, PA.
4. NCCLS Approved Standard, M100 (most recent approved supplement), *Performance Standards for Antimicrobial Susceptibility Testing*, Wayne, PA.
5. NCCLS Approved Standard, M23 (most recent approved supplement), *Development of In Vitro Susceptibility Testing Criteria and Quality Control Parameters*, Wayne, PA.
6. Transcript of the Microbiology Devices Panel Meeting, February 13, 1998.

XI. Environmental Impact

The agency has determined under 21 CFR 25.34(b) that this reclassification action is of a type that does not individually or cumulatively have a significant effect on the human environment. Therefore, neither an environmental assessment nor an environmental impact statement is required.

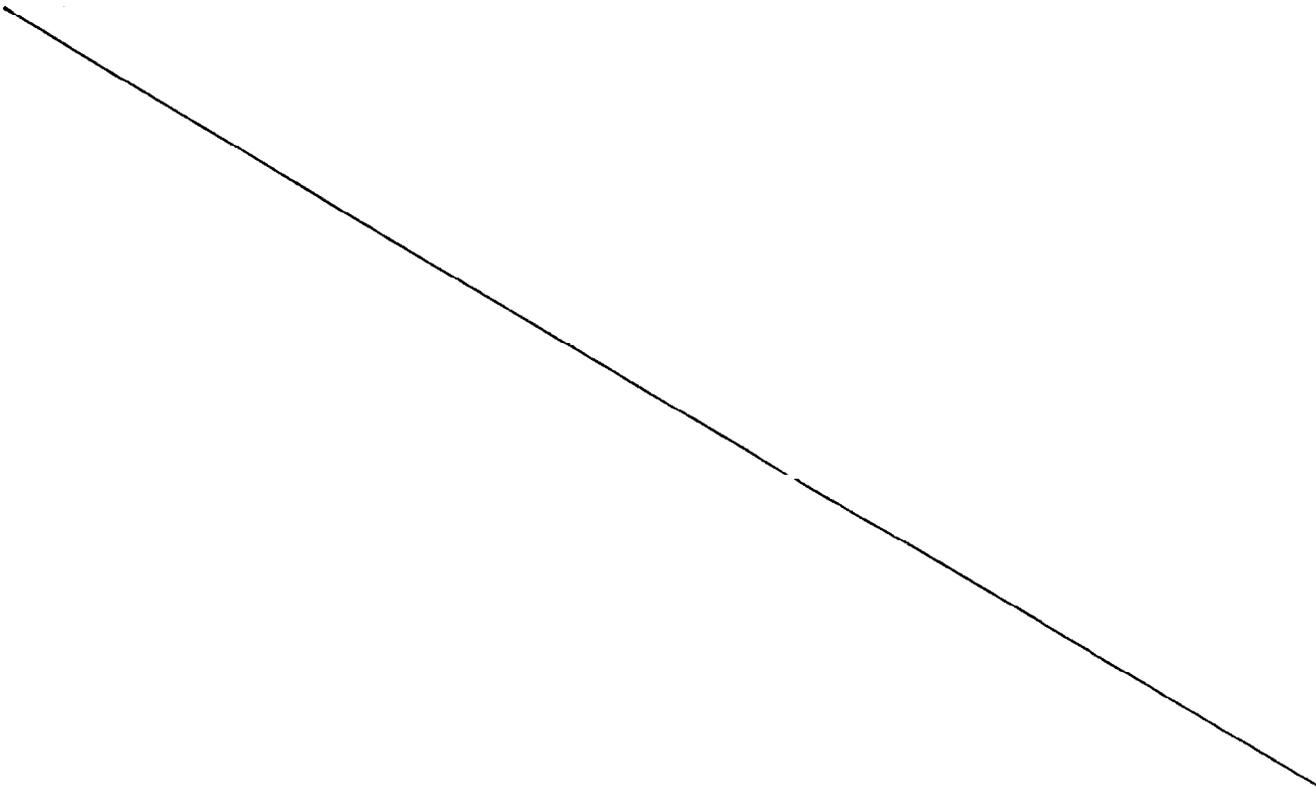
XII. Analysis of Impacts

FDA has examined the impacts of the notice under Executive Order 12866 and the Regulatory Flexibility Act (Public Law 96–354) (as amended by subtitle D of the Small Business Regulatory Fairness Act of 1996 (Public Law 104–121), and the Unfunded Mandates Reform Act of 1995 (Public Law 104–4)). Executive Order 12866 directs agencies to assess all costs and benefits of available regulatory alternatives and, when regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity). The agency believes that this reclassification action is consistent with the regulatory philosophy and principles identified in the Executive Order. In addition, the reclassification action is not a significant regulatory action as defined by the Executive Order and so is not subject to review under the Executive Order.

The Regulatory Flexibility Act requires agencies to analyze regulatory options that would minimize any significant impact of a rule on small entities. Reclassification of the device from class III to class II will relieve manufacturers of the cost of complying with the premarket approval requirements in section 515 of the act. Because reclassification will reduce regulatory costs with respect to this device, it will impose no significant economic impact on any small entities, and it may permit small potential competitors to enter the marketplace by lowering their costs. The agency therefore certifies that this reclassification action, if finalized, will not have a significant economic impact on a substantial number of small entities. In addition, this reclassification action will not impose costs of \$100 million or more on either the private sector or State, local, and tribal governments in the aggregate, and therefore a summary statement of analysis under section 202(a) of the Unfunded Mandates Reform Act of 1995 is not required.

XIII. Request for Comments

Interested persons may, on or before [*insert date 90 days after date of publication in the Federal Register*], submit to the Dockets Management Branch (address above) written comments regarding this document. Two copies of any comments are to be submitted, except that individuals



may submit one copy. Comments are to be identified with the docket number found in brackets in the heading of this document. A copy of the document and received comments may be seen in the Dockets Management Branch between 9 a.m. and 4 p.m., Monday through Friday.

Dated: 2/14/00
February 14, 2000

Linda S. Kahan

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Regulations Policy
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[FR Doc. 00-???? Filed ??-??-00; 8:45 am]

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