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MEDICAL DEVICES

Shortcomings in FDA's Premarket Review, Postmarket Surveillance, and Inspections of Device Manufacturing Establishments

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Highlights

Highlights of GAO-09-370T, a testimony before the Subcommittee on Health, Committee on Energy and Commerce, House of Representatives

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Why GAO Did This Study

Americans depend on the Food and Drug Administration (FDA) to provide assurance that medical devices sold in the United States are safe and effective. FDA classifies medical device types into three classes, with class I including those with the lowest risk to patients (such as forceps) and class III including those with the greatest risk (such as pacemakers). FDA's responsibilities include premarket and postmarket oversight—spanning, for example, both premarket review of devices and postmarket surveillance (the collection and analysis of data on marketed devices). These responsibilities apply to all devices marketed in the United States, regardless of whether they are manufactured domestically or overseas. In 2009, GAO added FDA's oversight of medical products, including devices, to its list of high-risk areas warranting attention by Congress and the executive branch.

GAO was asked to testify on recent work related to FDA's responsibilities for medical devices, including premarket review, postmarket surveillance, and inspection of manufacturing establishments. This statement is based on a recent GAO report, *Medical Devices: FDA Should Take Steps to Ensure That High-Risk Device Types Are Approved through the Most Stringent Premarket Review Process* (GAO-09-190, January 15, 2009) and on other GAO reports and testimonies related to FDA oversight.

View GAO-09-370T or key components. For more information, contact Marcia Crosse at (202) 512-7114 or crossem@gao.gov.

What GAO Found

GAO found that FDA does not review all class III devices through its most stringent premarket review process. Unless exempt by regulation, new devices must clear FDA premarket review through either the 510(k) premarket notification process, which is used to determine if a new device is substantially equivalent to another legally marketed device, or through the more stringent premarket approval (PMA) process, which requires the manufacturer to supply evidence providing reasonable assurance that the device is safe and effective. In 1976, Congress envisioned that FDA would eventually approve all class III devices through the more stringent PMA process, but this process remains incomplete. GAO found that in fiscal years 2003 through 2007, FDA cleared 228 submissions representing 24 types of class III devices through the 510(k) process. GAO recommended in its January 2009 report that FDA expeditiously take steps to issue regulations requiring PMAs for or reclassifying class III device types currently allowed to enter the market via the 510(k) process. In response, in April 2009, FDA required manufacturers to submit information on the safety and effectiveness of these types of devices. However, FDA did not specify a time frame for how quickly it will reclassify them or require PMAs for those device types that remain in class III.

FDA also faces challenges in postmarket surveillance of medical devices. In 2008, GAO reported that the number of adverse event reports associated with medical devices increased substantially from 2000 to 2006. Both GAO and FDA, however, have identified shortcomings in FDA's postmarket oversight. For example, in 2006 FDA reported that the agency's ability to understand the risks related to the use of medical devices is limited by the fact that the volume of submitted reports exceeded FDA's ability to consistently enter or review the reports in a routine manner. In 2008, FDA officials told us that while they have a number of strategies to prioritize their reviews of adverse event reports, they still cannot review all the reports they receive.

Finally, GAO has found that FDA has not conducted required inspections of manufacturing establishments, another key FDA responsibility for medical devices marketed in the United States. In 2008, GAO reported that FDA has not met a statutory requirement to inspect certain domestic manufacturing establishments every 2 years. Instead, FDA officials estimated that the agency has inspected domestic establishments every 3 years (for class III devices) or 5 years (for class II devices). There is no comparable requirement to inspect foreign establishments, and FDA officials estimate that they have been inspected every 6 years (for class III devices) or 27 years (for class II devices). GAO reported that FDA has taken some steps to address shortcomings related to inspections of foreign establishments, but GAO has not evaluated whether these changes will improve FDA's inspection program.

Taken together, these shortcomings in both premarket and postmarket activities raise serious concerns about FDA's regulation of medical devices.

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today as you examine issues related to the regulation of medical devices. Americans depend on the Food and Drug Administration (FDA), an agency within the Department of Health and Human Services (HHS) responsible for ensuring that medical devices and other medical products sold in the United States are safe and effective.[1]

FDA's responsibilities for medical devices begin before a new device is brought to market and continue after a device's clearance or approval, and these responsibilities apply to devices marketed in the United States regardless of whether they are manufactured domestically or overseas. FDA reviews submissions for thousands of new devices filed each year to decide whether they should be allowed to be marketed in the United States and is also responsible for oversight of thousands of devices already on the market. As part of both premarket and postmarket oversight, the agency inspects manufacturing establishments to ensure they are in compliance with the good manufacturing practices specified in FDA's quality system regulation as well as other statutory and regulatory requirements.

Recently, concerns have been expressed about FDA's ongoing ability to fulfill its mission of ensuring the safety and efficacy of medical products, including drugs, biologics, and devices. Reports issued by FDA's Science Board in 2007 and the Congressional Research Service in 2008 point out that the demands on the agency have soared in recent years for a variety of reasons, including the complexity of new products submitted to FDA for premarket approval and the globalization of the industries that FDA regulates. The Science Board also found that FDA's resources had not increased in proportion to the growing demands placed on it, putting public health at risk. In its fiscal year 2007 and 2008 reports, the HHS Office of Inspector General identified the oversight of drug and device safety as one of HHS's top management challenges. In January 2009, we added FDA's oversight of medical products, including devices, to GAO's

[1]Generally, medical devices include items used for the diagnosis, cure, mitigation, treatment, or prevention of a disease. See 21 U.S.C. § 321(h). Throughout this statement, the term *device* refers to a medical device that is not being regulated as a drug or a biological product.

list of high-risk areas warranting attention by Congress and the executive branch.[2]

Medical devices range from simple tools like bandages and surgical clamps to complicated devices like pacemakers. FDA classifies each type of device into one of three classes—class I, II, or III—based on the level of risk it poses and the controls necessary to provide reasonable assurance that it is safe and effective.[3] According to FDA, the risk the type of device poses to the patient or the user is a major factor in the class it is assigned: class I includes devices with the lowest risk and class III includes devices with the highest risk. Examples of types of devices in each class include the following:

- class I: tongue depressors, elastic bandages, reading glasses, and forceps;
- class II: electrocardiographs, powered bone drills, and mercury thermometers; and
- class III: pacemakers and replacement heart valves.

[2]See GAO, *High-Risk Series: An Update*, GAO-09-271 (Washington, D.C.: Jan. 2009).

[3]Throughout this statement, we refer to *type of device* or *device type* to indicate a generic category of device, which has a particular intended use (for example, a scalpel is intended to cut tissue) and which may include a variety of models made by different manufacturers. FDA's classifications of device types are codified in parts 862 through 892 of title 21 of the *Code of Federal Regulations*. Class I devices are those for which compliance with general controls, such as good manufacturing practices specified in FDA's quality system regulation, are sufficient to provide reasonable assurance of their safety and effectiveness. Class II devices are subject to general controls and may also be subject to special controls, such as postmarket surveillance. For class II devices intended to support or sustain human life, FDA must examine, identify, and describe the special controls necessary to provide assurance of their safety and effectiveness. Class III devices are those (1) for which insufficient information exists to determine whether general and special controls are sufficient to provide reasonable assurance of their safety and effectiveness *and* (2) that support or sustain human life or are of substantial importance in preventing impairment of human health, or that present a potential unreasonable risk of illness or injury. See 21 U.S.C. § 360c.

In general, unless exempt under FDA regulations,[4] devices are subject to one of two types of FDA premarket review before they may be legally marketed in the United States.[5]

- **Premarket approval (PMA)**: The manufacturer must provide evidence, typically including clinical data, providing reasonable assurance that the new device is safe and effective. The PMA process is the most stringent type of premarket review. A successful submission results in FDA approval.

- **Premarket notification (510(k))**: The manufacturer must demonstrate to FDA that the new device is *substantially equivalent* to a legally marketed device that does not require a PMA.[6] A successful submission results in FDA clearance.

My remarks today will discuss shortcomings we have identified in FDA's premarket review of medical devices, FDA's postmarket surveillance activities, and FDA's inspections of manufacturing establishments. My statement includes findings from our recent report on FDA's premarket review of medical devices.[7] My statement also draws from several other GAO reports and testimonies on FDA inspections of domestic and foreign

[4]Under federal regulations, many types of devices are exempt from FDA premarket review. Although FDA does not track the number of devices that are actually sold or marketed in the United States, manufacturers are required to register with FDA and provide a list of devices intended for commercial distribution, including device types that are exempt from premarket review. See 21 U.S.C. § 360(j)(2)(A); 21 C.F.R. § 807.21 (2008). About 67 percent of the more than 50,000 separate devices that manufacturers listed with FDA during fiscal years 2003 through 2007 were exempt from premarket review. Of the exempt devices that manufacturers listed with FDA, about 95 percent were class I devices, for example reading glasses and forceps. About 5 percent were class II devices, for example wheeled stretchers and mercury thermometers.

[5]A small percentage of devices enter the market by other means, such as through the humanitarian device exemption process that allows market entry, without adherence to certain requirements, for devices benefiting patients with rare diseases or conditions. See 21 U.S.C. § 360j(m), 21 C.F.R. pt. 814, subpart H (2008).

[6]*Substantial equivalence* or *substantially equivalent* means that the device has the same intended use as another legally marketed device and the same technological characteristics, or different technological characteristics and submitted information demonstrates that the device is as safe and effective as the legally marketed device and does not raise different questions of safety or effectiveness. See 21 U.S.C. § 360c(i)(1)(A).

[7]See GAO, *Medical Devices: FDA Should Take Steps to Ensure That High-Risk Device Types Are Approved through the Most Stringent Premarket Review Process*, GAO-09-190 (Washington, D.C.: Jan. 15, 2009).

device manufacturing establishments and other aspects of FDA's oversight of devices that we have issued since 2007,[8] as well as ongoing work we are conducting related to FDA.

For this body of work, we analyzed information from FDA databases;[9] interviewed FDA officials; and reviewed pertinent statutes, regulations, guidance, and reports. For the report on FDA's premarket review of devices, we examined the premarket review processes—the 510(k) premarket notification process or the premarket approval (PMA) process—FDA used in fiscal years 2003 through 2007 and reviewed a sample of FDA files related to submissions for new devices. Our analysis included traditional and abbreviated 510(k) submissions, original PMA submissions, and submissions for two types of supplemental PMAs: panel-track PMA supplements (which are supplements requesting approval for a significant change in design or performance, or a new use of a device, for which clinical data are generally necessary to provide reasonable assurance of safety and effectiveness) and 180-day PMA supplements (which are supplements requesting approval for a significant change in components, materials, design, specification, software, color additives, or labeling).[10]

To assess FDA's program for inspecting establishments that manufacture medical devices, we analyzed information from three FDA databases[11] and interviewed officials from FDA's Center for Devices and Radiological Health and Office of Regulatory Affairs, which each have responsibilities for managing the medical device inspection program. We also obtained updated information from FDA on the status of FDA's programs for third-party inspections in June 2009. Specifically, we obtained data from FDA on the number of inspections conducted by accredited third parties since March 11, 2004—the date when FDA first cleared an accredited organization to conduct inspections.

[8]See "Related GAO Products" at the end of this testimony.

[9]The databases we used included FDA's 510(k) and premarket approval (PMA) databases, Device Nomenclature Management System, Device Registration and Listing System (DRLS), Field Accomplishments and Compliance Tracking System (FACTS), and Operational and Administrative System for Import Support (OASIS).

[10]Our analysis did not include certain types of device submissions, for example, special 510(k) submissions, which are requests for clearance of minor modifications to devices that have already been cleared through the 510(k) process.

[11]The FDA databases we used were DRLS, FACTS, and OASIS.

We conducted our work in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

FDA's responsibilities related to medical devices include premarket and postmarket oversight—spanning, for example, both premarket review of devices and postmarket surveillance (the collection and analysis of data on marketed devices). As part of both premarket and postmarket oversight, FDA is responsible for inspecting certain foreign and domestic establishments to ensure they meet required manufacturing standards.

Premarket Review

Relative to the PMA process, the 510(k) premarket review process is generally:

- **Less stringent**. For most 510(k) submissions, clinical data are not required and substantial equivalence will normally be determined based on comparative device descriptions, including performance data. In contrast, in order to meet the PMA approval requirement of providing reasonable assurance that a new device is safe and effective, most original PMAs and some PMA supplements require clinical data.

- **Faster**. FDA generally makes decisions on 510(k) submissions faster than it makes decisions on PMA submissions. FDA's fiscal year 2009 goal is to review and decide on 90 percent of 510(k) submissions within 90 days and 98 percent of them within 150 days. The comparable goal for PMAs is to review and decide upon 60 percent of original PMA submissions in 180 days and 90 percent of them within 295 days.[12]

- **Less expensive**. The estimated cost to FDA for reviewing submissions is substantially lower for 510(k) submissions than for PMA submissions. For fiscal year 2005, for example, according to FDA the estimated average cost for the agency to review a 510(k) submission was about $18,200, while the estimate for a PMA submission was about $870,000. For the applicant, the standard fee provided to FDA at the time of submission is also significantly lower for a 510(k) submission than for a PMA submission. In

[12]FDA's goals for original PMAs included panel-track PMA supplements.

fiscal year 2009, for example, the standard fee for 510(k) submissions is $3,693, while the standard fee for original PMA submissions is $200,725.

In general, class I and II device types subject to premarket review are required to obtain FDA clearance through the 510(k) process, and class III device types are required to obtain FDA approval through the more stringent PMA process. With the enactment of the Medical Device Amendments of 1976, Congress imposed requirements under which all class III devices would be approved through the PMA process before being marketed in the United States.[13] However, certain types of class III devices that were in commercial distribution in the United States before May 28, 1976[14] (called preamendment device types) and those determined to be substantially equivalent to them may be cleared through the less stringent 510(k) process until FDA publishes regulations requiring them to go through the PMA process or reclassifies them into a lower class.[15] Prior to 1990, FDA issued regulations requiring some class III device types to go through the PMA process but many class III device types continued to be reviewed through the 510(k) process.[16] The Safe Medical Devices Act of 1990 required FDA (1) to reexamine the preamendment class III device types for which PMAs were not yet required to determine if they should be reclassified to class I or II or remain in class III and (2) to establish a schedule to promulgate regulations requiring those preamendment device types that remain in class III to obtain FDA approval through the PMA process.[17] Accordingly, all class III devices are eventually to be reviewed through the PMA process.

[13]See Pub. L. No. 94-295, 90 Stat. 539, 552-53 (codified at 21 U.S.C. § 360e).

[14]May 28, 1976, is the date of enactment of the Medical Device Amendments of 1976, which established the three device classes. Pub. L. No. 94-295, 90 Stat. 539.

[15]Based on new information respecting a device, FDA may, upon its initiative or upon petition of an interested person, by regulation change the classification of a device from class III to (1) class II if it determines that special controls would provide reasonable assurance of the safety and effectiveness of the device and that general controls alone would not provide reasonable assurance of the safety and effectiveness of the device or (2) class I if FDA determines that general controls alone would provide reasonable assurance of the safety and effectiveness of the device. 21 U.S.C. § 360c(e).

[16]In August 1988, GAO reported that FDA had called for premarket approval applications for only 9 of approximately 150 types of preamendment class III device types. See GAO, *Medical Devices: FDA's 510(k) Operations Could Be Improved*, GAO/PEMD-88-14 (Washington, D.C.: Aug. 17, 1988).

[17]Pub. L. No. 101-629, § 4(b), 104 Stat. 4511, 4515-17 (codified at 21 U.S.C. § 360c(i)).

Postmarket Surveillance

In addition to its responsibilities for premarket review of devices, FDA's postmarket activities to help ensure that devices already on the market remain safe and effective include collecting and analyzing reports of device-related adverse events and reviewing annual reports required from manufacturers.[18] FDA's reporting framework for device-related adverse events includes both mandatory and voluntary components. Under FDA's Medical Device Reporting regulation,

- manufacturers are required to report device-related deaths, serious injuries, and certain malfunctions to FDA and
- user facilities, such as hospitals and nursing homes, are required to report device-related deaths to FDA and to the device manufacturer and to report serious injuries to the manufacturer (or, if the manufacturer is unknown, to FDA).

Manufacturers and user facilities, as well as health professionals and consumers, may also voluntarily report less serious device-related events to FDA. FDA maintains databases that include both mandatory and voluntary reports of device-related adverse events, which agency officials can search to conduct research on trends or emerging problems with device safety. FDA scientists review these reports, request follow-up investigations, and determine whether further action is needed to ensure patient safety. Such action may include product recalls, public health advisories to notify health care providers and the public of potential device-related health and safety concerns, or requiring a manufacturer to change the instructions in its device labeling.

[18]FDA approves some devices conditionally, meaning that as a condition of approval, manufacturers must comply with specific terms specified by FDA, such as conducting postmarket surveillance studies. Manufacturers report to FDA on their compliance with these conditions through annual reports.

Inspections of Device Manufacturing Establishments

Finally, as part of both premarket and postmarket oversight of medical devices, FDA is responsible for inspecting certain foreign and domestic establishments to ensure they meet required manufacturing standards.[19] Such inspections are FDA's primary means of assuring that the safety and effectiveness of devices are not jeopardized by poor manufacturing practices. Requirements governing domestic and foreign inspections differ. Specifically, FDA is required to inspect domestic establishments that manufacture class II or III devices every 2 years.[20] There is no comparable requirement to inspect foreign establishments.

In 2002, in response to concerns about FDA's ability to meet its responsibilities for inspecting device manufacturing establishments, Congress included certain provisions in the Medical Device User Fee and Modernization Act of 2002 (MDUFMA).[21] These provisions were designed to (1) increase the number of inspected device manufacturing establishments and (2) help device manufacturers meet the inspection requirements of both the United States and foreign countries in a single inspection. Specifically, MDUFMA required FDA to accredit third-party organizations to conduct inspections of certain foreign and domestic establishments. In response, FDA implemented its Accredited Persons Inspection Program, which permits certain establishments to voluntarily request inspections from third-party organizations to meet inspectional requirements. Additionally, in September 2006, in partnership with Health Canada,[22] FDA established another program for inspection by accredited third parties—the Pilot Multi-purpose Audit Program—that allows accredited organizations to conduct a single inspection to meet the regulatory requirements of both countries.

[19]FDA regulations define an establishment as a place of business under one management at one general physical location at which a device is manufactured, assembled, or otherwise processed. 21 C.F.R. § 807.3(c) (2007). Device manufacturers may have more than one establishment. We use the term *manufacture* to refer to activities including manufacturing, preparing, and processing devices.

[20]21 U.S.C. § 360(h). There is no statutory requirement for inspection of class I device manufacturing establishments, and FDA does not routinely inspect them. However, FDA periodically inspects establishments manufacturing surgeon's gloves and patient examination gloves, which are both class I devices, due to ongoing problems with leakage. FDA also periodically inspects manufacturers of randomly selected class I devices.

[21]See Pub. L. No. 107-250, § 201, 116 Stat. 1588, 1602-09 (2002) (codified as amended at 21 U.S.C. § 374(g)).

[22]Health Canada is the governmental entity that regulates medical devices marketed in Canada.

FDA Has Not Ensured That All Class III Devices Are Approved through the Most Stringent Premarket Review Process

Although Congress envisioned that all class III devices would eventually be approved through the more stringent PMA process, we found that this was not always the case. In January 2009, we reported that in fiscal years 2003 through 2007, FDA reviewed all submissions for class I and II devices through the 510(k) process, and reviewed submissions for some types of class III devices through the 510(k) process and others through the PMA process.[23]

- FDA reviewed all 13,199 submissions for class I and class II devices through the 510(k) process, clearing 11,935 (90 percent) of these submissions.
- FDA also reviewed 342 submissions for class III devices through the 510(k) process, clearing 228 (67 percent) of these submissions.
- In addition, the agency reviewed 217 original PMA submissions and 784 supplemental PMA submissions for class III devices and approved 78 percent and 85 percent, respectively, of these submissions.

Table 1 summarizes the FDA review decisions, by class of device, in fiscal years 2003 through 2007 for 510(k) and PMA submissions.

[23]See GAO-09-190.

Table 1: FDA 510(k) and PMA Decisions by Class, Fiscal Years 2003 through 2007

Submission type	Device class	Determined substantially equivalent or approved (percentage of row)	Determined not substantially equivalent or denied (percentage of row)	Other decision[a] (percentage of row)	Total (percentage of row)
510(k)	Class I	1,265 (84)	40 (3)	204 (14)	**1,509 (100)**
	Class II	10,670 (91)	373 (3)	647 (6)	**11,690 (100)**
	Class III	228 (67)	100 (29)	14 (4)	**342 (100)**
	Other[b]	476 (33)	27 (2)	955 (66)	**1,458 (100)**
PMA					
Original	Class III	170 (78)	—[c]	47 (22)[c]	**217 (100)**
Supplemental[d]	Class III	664 (85)	—[c]	120 (15)[c]	**784 (100)**

Source: GAO analysis of FDA data.

Notes: Data represent 14,999 traditional and abbreviated 510(k) submissions, 217 original PMA submissions, and 784 supplemental PMA submissions for which FDA made review decisions in fiscal years 2003 through 2007. Percentages may not sum to 100 because of rounding.

[a]Other decisions include submissions that were withdrawn, were exempted by regulation, were not responsive to FDA's requests within a specified time frame, were forwarded to another FDA center (e.g., drugs or biologics), were duplicates, or were for products determined not to be devices.

[b]Other device class includes submissions for which a device class was not recorded in FDA's 510(k) database.

[c]According to FDA data, all PMA decisions during fiscal years 2003 through 2007 were approved or withdrawn. FDA did not deny approval of any PMA submissions during this period. According to FDA officials, when a PMA was seriously deficient, FDA issued a "not approvable" letter under 21 C.F.R. § 814.44(f) and placed the submission on hold. A company may withdraw a submission voluntarily. FDA also considers submissions to be withdrawn voluntarily if the applicant is unable to provide the information necessary to support approval within 180 days.

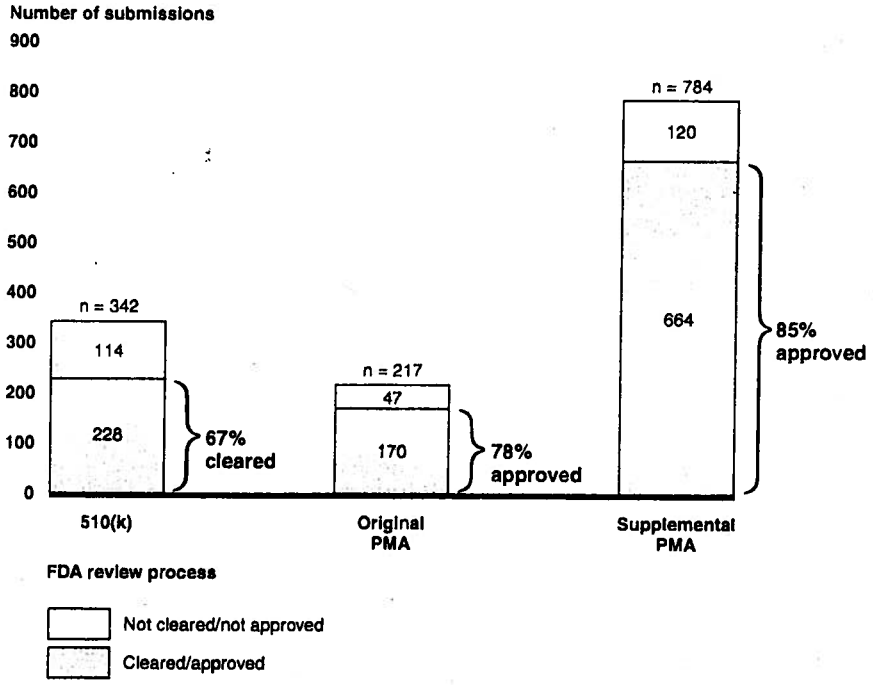
[d]Supplemental PMA submissions include 180-day (user-fee) and panel-track PMA supplements. The numbers in this row do not include other types of PMA supplements.

With respect to class III devices, in fiscal years 2003 through 2007, FDA reviewed submissions for some types of class III devices through the 510(k) process, and other types of class III devices through the PMA process. Specifically, FDA reviewed 342 submissions for new class III devices through the 510(k) process, determining 228 (67 percent) of these submissions to be substantially equivalent to a legally marketed device.[24]

[24]Consumer advocates have raised questions regarding 510(k) clearance of devices that may utilize new technologies that are different than those in the marketed devices to which they are compared. In our review of a representative sample of 510(k) submissions for which FDA reached a review decision of substantially equivalent or not substantially equivalent in fiscal years 2005 through 2007, we found that FDA determined 23 percent of cleared class III device submissions had new technological characteristics. This compares to 14 percent of cleared class II submissions.

During the same time period, FDA reviewed 217 original PMA submissions and 784 supplemental PMA submissions for class III devices and approved 78 percent and 85 percent of them, respectively. (See fig. 1.)

Figure 1: Class III Device Submissions with FDA Review Decisions in Fiscal Years 2003 through 2007, by FDA Review Process and Review Decision



Source: GAO analysis of FDA data.

Notes: Figure represents FDA review decisions made between October 1, 2002, and September 30, 2007, for class III device submissions reviewed through the 510(k) and PMA processes. 510(k) includes traditional and abbreviated 510(k) submissions; supplemental PMA includes panel-track supplements and 180-day (user-fee) supplements.

Not cleared/not approved includes (1) for 510(k) submissions, those submissions FDA found to be not substantially equivalent or withdrawn and (2) for PMA submissions, those submissions that were withdrawn. According to FDA data, all PMA decisions during fiscal years 2003 through 2007 were approved or withdrawn. FDA did not deny approval of any PMA submissions during this period. According to FDA officials, when a PMA is seriously deficient, FDA issues a "not approvable" letter and places the submission on hold. An applicant may then withdraw a submission voluntarily. FDA also considers submissions to be withdrawn voluntarily if the applicant is unable to provide the information necessary to support approval within 180 days.

The 228 class III device submissions FDA cleared through the 510(k) process in fiscal years 2003 through 2007 were for devices such as artificial hip joints, implantable blood access devices, and automated external defibrillators. Class III 510(k) submissions were more likely than other 510(k) submissions to be for device types that were implantable; were life sustaining; or pose a significant risk to the health, safety, or welfare of a patient. Of the 228 510(k) submissions for class III devices that FDA cleared in fiscal years 2003 through 2007, FDA's databases flagged 66 percent as being for device types that are implantable, life sustaining, or of significant risk. This compares to no 510(k) submissions for class I devices and 25 percent of 510(k) submissions for class II devices.

Although the Medical Device Amendments of 1976 imposed requirements under which all class III devices would be approved through the PMA process, and the Safe Medical Devices Act of 1990 required that FDA either reclassify or establish a schedule for requiring PMAs for class III device types, this process remains incomplete. The 228 class III device submissions cleared by FDA through the 510(k) process in fiscal years 2003 through 2007 represented 24 separate types of class III devices. As of October 2008, 4 of these device types had been reclassified to class II, but 20 device types could still be cleared through the 510(k) process. FDA officials said that the agency is committed to issuing regulations either reclassifying or requiring PMAs for the class III devices currently allowed to receive clearance for marketing via the 510(k) process, but did not provide a time frame for doing so.

We recommended that the Secretary of Health and Human Services direct the FDA Commissioner to expeditiously take steps to issue regulations for each class III device type currently allowed to enter the market through the 510(k) process. These steps should include issuing regulations to (1) reclassify each device type into class I or class II, or require it to remain in class III, and (2) for those device types remaining in class III, require approval for marketing through the PMA process. In commenting on a draft of our report, HHS agreed with our recommendation, noting that since 1994 (when FDA announced its strategy to implement provisions of the Safe Medical Devices Act of 1990) FDA has called for PMAs or reclassified the majority of class III devices that did not require PMAs at that time. The department's comments, however, did not specify time frames in which FDA will address the remaining class III device types allowed to enter the market via the 510(k) process, stating instead that the agency is considering its legal and procedural options for completing this task as expeditiously as possible, consistent with available resources and competing time frames. Given that more than 3 decades have passed since

Congress envisioned that all class III devices would eventually be required to undergo premarket review through the more stringent PMA process, we believe it is imperative that FDA take immediate steps to address the remaining class III device types that may still enter the market through the less stringent 510(k) process by requiring PMAs for or reclassifying them.

In April 2009, FDA took what it termed "the first step towards completing the review of Class III device types predating the 1976 law, as was recommended by the U.S. Government Accountability Office (GAO) in a January 2009 report to Congress." Specifically, FDA announced that it was requiring manufacturers of 25 types of class III medical devices marketed prior to 1976 to submit safety and effectiveness information to the agency by August 7, 2009, so that it may evaluate the risk level for each device type. In the *Federal Register* notice announcing the requirement,[25] FDA stated that once the safety and effectiveness information was submitted, the agency would be able to determine which device types would be required to undergo the agency's most stringent premarket review process. FDA's requirement that manufacturers submit safety and effectiveness information is an essential initial step toward implementing our recommendation and fully implementing the law. However, FDA did not specify a time frame for how quickly it will review the submitted information, determine whether to reclassify the device types, and require PMAs for those that remain in class III.

It should be noted, however, that while the PMA process is more stringent than the 510(k) process, FDA can approve a device through the PMA process without clinical data demonstrating the safety and effectiveness of the device. For example, in our review of FDA's approval of PMAs for certain temporomandibular joint (jaw) implants, FDA managers overruled their review staff to approve one of the devices, despite the review staff's concern over the sufficiency of the clinical data.[26] The review decision stated that either good engineering data or good clinical data—not necessarily both—were acceptable to approve a device and accepted the engineering data as a basis for approving an implanted device for which the review staff had determined that the clinical data were inadequate.

[25]See 74 Fed. Reg. 16214 (Apr. 9, 2009).

[26]See GAO, *Medical Devices: FDA's Approval of Four Temporomandibular Joint Implants*, GAO-07-996 (Washington, D.C.: Sept. 17, 2007).

FDA Faces Challenges in Postmarket Surveillance

In our recent high-risk report, we noted that FDA's monitoring of postmarket safety of approved products, including medical devices, has been questioned by numerous groups.[27] In 2008, we reported that the number of adverse event reports associated with all devices increased substantially from about 77,000 reports in 2000 to about 320,000 reports in 2006.[28] FDA's review and analysis of these reports provides information about trends such as infection outbreaks or common user errors caused by inadequate instructions and may result in actions such as device recalls. During fiscal year 2006, FDA initiated 651 recall actions involving 1,550 medical devices. This included 21 recall actions in which FDA determined that it was likely that the use of the medical device would cause serious health problems or death.

We and FDA have identified shortcomings in FDA's postmarket surveillances. In 2006, FDA reported that the agency's Center for Devices and Radiological Health's ability to understand the risks of adverse events related to the use of medical devices—whether used in the in the home of a patient, in a hospital, in a laboratory, or in the office of a private practitioner—is limited both by a lack of informative, validated adverse event reports and by a lack of quality epidemiologic information.[29] FDA specifically reported:

- One major constraint is the lack of objective data about device use and device-related problems.
- Underreporting of adverse events continues to be a problem.
- FDA's medical device reporting system is a passive system—that is, the reports are entered as reported by manufacturers, facilities, practitioners, or patients—and, as a result, some reports are incomplete or difficult to understand.

[27]See GAO-09-271, 18.

[28]FDA officials told us that the vast majority of reports involve a device malfunction that has the potential to cause a death or serious injury if the malfunction were to recur, even though there was no death or serious injury in the reported event. See GAO, *Reprocessed Single-Use Medical Devices: FDA Oversight Has Increased, and Available Information Does Not Indicate That Use Presents an Elevated Health Risk*, GAO-08-147 (Washington, D.C.: Jan. 31, 2008).

[29]See Food and Drug Administration, *Ensuring the Safety of Marketed Medical Devices, CDRH's Medical Device Postmarket Safety Program* (Jan. 18, 2006).

- The volume of submitted reports exceeded the center's ability to consistently enter or review the data in a routine manner.

In its 2006 report, FDA identified areas for improvement in postmarket problem assessment for the center. In 2008, FDA officials told us that while they have a number of strategies to prioritize their reviews, they still cannot review all the reports they receive.

We have also found shortcomings in FDA's monitoring of manufacturers' compliance with requirements following device approval. In 2007, we found that manufacturers do not always submit their required annual reports in a timely manner. For example, FDA was missing five annual reports from the manufacturer of one device we were examining, but it was not until we requested these reports that FDA contacted the manufacturer to obtain the missing information.[30] Without these annual reports, FDA cannot adequately monitor manufacturers' compliance with postmarket requirements.

FDA Has Not Conducted Required Inspections of Manufacturing Establishments

Our work has also identified challenges faced by FDA in terms of inspecting establishments that manufacture medical devices. In January 2008, we testified that FDA has not met a statutory requirement to inspect certain domestic manufacturing establishments every 2 years.[31] FDA officials estimated that the agency has inspected these establishments every 3 years (for establishments manufacturing class III devices) or every 5 years (for establishments manufacturing class II devices). There is no comparable requirement to inspect foreign establishments, and agency officials estimate that these establishments have been inspected every 6 years (for class III devices) or 27 years (for class II devices).

We also testified that FDA faces additional challenges in managing its inspections of foreign device establishments. We found that two databases that provide FDA with information about foreign device establishments and the products they manufacture for the U.S. market contain inaccuracies that create disparate estimates of establishments subject to FDA inspection.[32] Although comparing information from these two

[30]GAO-07-996.

[31]See GAO, *Medical Devices: Challenges for FDA in Conducting Manufacturer Inspections*, GAO-08-428T (Washington, D.C.: Jan. 29, 2008).

[32]These two databases are DRLS and OASIS.

databases could help FDA determine the number of foreign establishments marketing devices in the United States, these databases cannot exchange information and any comparisons must be done manually. Moreover, inspections of foreign device manufacturing establishments pose unique challenges to FDA, such as difficulties in finding translation services and in extending trips if the inspections uncover problems. FDA has taken some steps to address shortcomings related to inspections of foreign establishments, including changes to its registration database to improve the accuracy of the count of establishments and initiatives to address unique challenges related to inspections of foreign manufacturers, but we have not evaluated whether these changes will improve FDA's inspection program.

In addition, FDA's accredited third-party inspection programs may be unable to quickly help FDA fulfill its responsibilities. In January 2007, we reported on the status of the Accredited Persons Inspection Program, citing, among other things, concerns regarding its implementation and potential incentives and disincentives that may influence manufacturers' participation.[33] We found that several factors may influence manufacturers' interest in voluntarily requesting an inspection by an accredited organization. According to FDA and representatives of affected entities, there are potential incentives and disincentives to requesting an inspection, as well as reasons for deferring participation in the program. Potential incentives include the opportunity to reduce the number of inspections conducted to meet FDA and other countries' requirements and to control the scheduling of the inspection. Potential disincentives include bearing the cost for the inspection and uncertainty about the potential consequences of making a commitment to having an inspection to assess compliance with FDA requirements in the near future. Some manufacturers might be deferring participation. For example, manufacturers that already contract with a specific accredited organization to conduct inspections to meet the requirements of other countries might defer participation until FDA has cleared that organization to conduct independent inspections. In both our January 2008 and May 2008 testimonies, we reported that few inspections of device manufacturing establishments had been conducted through FDA's two

[33]See GAO, *Medical Devices: Status of FDA's Program for Inspections by Accredited Organizations*, GAO-07-157 (Washington, D.C.: Jan. 5, 2007).

accredited third-party inspection programs.[34] As of June 12, 2009, FDA reported that a total of 21 inspections—8 inspections of domestic establishments and 13 inspections of foreign establishments—had been conducted under these programs. The small number of inspections completed by accredited third-party organizations raises questions about the practicality and effectiveness of these programs to quickly help FDA increase the number of establishments inspected.

Taken together, these shortcomings in both premarket and postmarket activities raise serious concerns about FDA's regulation of medical devices.

Mr. Chairman, this completes my prepared statement. I would be happy to respond to any questions you or the other members of the subcommittee may have at this time.

Contacts and Acknowledgments

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[34]See GAO-08-428T and GAO, *Medical Devices: FDA Faces Challenges in Conducting Inspections of Foreign Manufacturing Establishments*, GAO-08-780T (Washington, D.C.: May 14, 2008).

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