

Medical Products: From Concept To Market

KEY DEFINITIONS

There are three regulatory centers under the FDA that medical products fall under, **Center for Devices and Radiological Health (CDRH)**, **Center for Drug Evaluation and Research (CDER)**, and **Center for Biological Evaluation and Research (CBER)**. Each of these centers has specific regulations and compliance measures for medical product approvals. Of particular importance is current good manufacturing practices (cGMPs), quality systems regulations (QSR), and design controls.

Current good manufacturing practice (cGMP) requirements govern the methods used in, and the facilities and controls used for, the design, manufacture, packaging, labeling, storage, installation, and servicing of all finished devices intended for human use.⁵

Quality system regulations (QSR) refer to compliance practices related to the organizational structure, responsibilities, procedures, processes, and resources for implementing quality management.⁵

Design controls are an interrelated set of practices and procedures that are incorporated into the design and development process, i.e., a system of checks and balances. Design controls make systematic assessment of the design an integral part of development. As a result, deficiencies in design input requirements, and discrepancies between the proposed designs and requirements, are made evident and corrected earlier in the development process. Design controls increase the likelihood that the design transferred to production will translate into a device that is appropriate for its intended use.

Clinical Trials Process

- Early Research and pre-clinical testing – Identify pre-clinical type, protocol, and design
- Phase I: Preliminary Safety Evaluation Studies – compliance with good clinical practice.
- Phase II: Efficacy Evaluation and short-term safety studies – validation of clinical data.
- Phase III: Results used in regulatory approval application for market approval – release clinical trials results.
- Phase IV: Post market studies, approval, and outcomes research.

Institutional Review Board: IRB. A group of scientists, doctors, clergy, and consumers at each health care facility that participates in a clinical trial. IRBs are designed to protect study participants. They review and must approve the action plan for every clinical trial. They check to see that the trial is well designed, does not involve undue risks, and includes safeguards for patients.

Medical Device Amendments of 1976

This law requires that most new medical devices undergo a review for safety and effectiveness by FDA before marketing. An important provision of this statute was the establishment of a three-tier classification system based on the potential risk of a device for the level of regulatory control exercised by FDA.

Class I (General Controls). Medical Devices classified in this category are low risk products that require only "general controls" to assure their safety and effectiveness.

General controls applicable to Class I products include the requirements for manufacturers to register their facilities, list the products they manufacture, and comply with FDA's Quality

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System Requirements for manufacturing devices (sometimes referred to as good manufacturing practices, GMPs). Most products in Class I are exempt from the requirement to submit an application for 510(k) pre-market clearance.

Class II (Special Controls). Medical devices in Class II include those products that entail a moderate degree of risk, for which general controls are considered insufficient to ensure safety and effectiveness, but FDA's "Special Controls" will provide adequate assurance of safety and effectiveness. Special Controls that FDA may use to regulate these products include performance standards, post-market surveillance, and patient registries. Most Class II products require submission of a 510(k) pre-market notification to FDA at least 90 days prior to introducing the product into commercial distribution.

Class III (Pre-market Approval). Comprising sophisticated medical instruments that entail significant risk to the patient, this category includes implantable cardiac pacemakers, angioplasty catheters, and similar devices used to support life or prevent potentially dangerous medical conditions such as heart attacks and cardiac arrhythmias. New products that are not substantially equivalent to a previously marketed device are automatically classified in Class III. Before a Class III product is approved for marketing, its manufacturer must submit to the FDA a Pre-market approval application (PMA) which includes documentation of clinical studies demonstrating the product's safety and effectiveness.

The Safe Medical Device Act of 1990

This act amended some of the provisions of the Medical Device Amendments of 1976 and established new FDA rules mandating reporting of device malfunctions.

This act law requires manufacturers, hospitals and other device users to report adverse effects associated with medical devices to the FDA. It also broadened the FDA's powers to detain or seize products, enjoin future violations, and/or assess civil or criminal penalties, including imposition of fines, for certain violations.

The Safe Medical Device Act of 1990 also created the Humanitarian Device Exemption (HDE), which permits FDA to reduce the extent of clinical data required for approval of products that have been shown to be reasonably safe and present a probable benefit for a US patient population of fewer than 4,000.

The FDA Modernization Act of 1997

The bill exempted most low-risk Class I medical devices from some requirements, such as 510(k), and allowed outside third-party experts to review certain pre-market notifications for Class II medium-risk devices.

The Medical Device User Fee and Modernization Act of 2002

Signed into law in October 2002, this legislation amended the Federal Food, Drug, and Cosmetic Act, providing the FDA with new responsibilities, resources, and challenges. The act has three particularly significant provisions:

Fees. The act established user fees for the review of medical device pre-market submissions.

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Inspections. Accredited third parties under carefully prescribed conditions will conduct manufacturing facilities inspections and audits.

New rules for reprocessed devices. The act created new regulatory requirements for reprocessed single-use devices, including a new category of pre-market submissions to be known as the pre-market report. These medical instruments are defined as those originally intended for one use, or for a single patient during a single procedure, which have been previously used and subsequently reprocessed.

FDA Approval Filings

510(k) Premarket Notification. Medical devices that are substantially similar to products already on the market can usually obtain FDA clearance via the agency's pre-market notification process, known as a 510(k).. This review process is required for a few Class I devices, most Class II devices and some Class III devices.

Premarket application (PMA). For Class III medical devices and devices that employ novel methods of treatment and are not substantially equivalent to currently marketed medical devices, manufacturers must submit a Pre-market Approval Application to the FDA.

Investigational device exemption (IDE). The IDE applies to any device that has not been cleared or approved by FDA for marketing which is to be evaluated in a clinical trial. The approval process for a new Class III device typically begins when the manufacturer submits an investigational device exemption to the FDA. If granted, this exemption lets the manufacturer conduct human clinical trials using the device.

Sources

- 1) Mastering and Managing The FDA Maze Medical Device Overview
Gordan Harnack, 1999 ASQ Quality Press
- 2) Title 21—Food and Drugs
Chapter I—Food and Drug Administration
Department of Health and Human Services
Subchapter H – Medical Devices
Part 820 Quality System Regulation
- 3) Design Control Report and Guidance, 1998
Center for Devices and Radiological Health, FDA
- 4) FDA Regulations, Eureka Medical, <http://www.eurekamed.com/fda-regulations.html>
- 5) MedTerms medical dictionary, <http://www.medterms.com>