FDA Premarket Regulation of Devices for Sleep Disordered Breathing (SDB)

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Collaborating Organizations

- American Academy of Dental Sleep Medicine
- American Academy of Neurology
- American Academy of Otolaryngology-Head and Neck Surgery
- American Academy of Sleep Medicine
- American College of Chest Physicians
- American Sleep Apnea Association

Presentation Outline

- Background/Risk-Based Classification of Devices
- Regulatory Pathways
  - 510(k) Pathway
  - Premarket Approval
  - De Novo Pathway
- Programs to Promote Device Innovation
- Premarket Review Issues with SDB Devices
- Goals for the Workshop

CDRH Mission Statement

"**The mission of the Center for Devices and Radiological Health (CDRH) is to protect and promote the public health. We assure that patients and providers have timely and continued access to safe, effective, and high-quality medical devices and safe radiation-emitting products.** We provide consumers, patients, their caregivers, and providers with understandable and accessible science-based information about the products we oversee. We facilitate medical device innovation by advancing regulatory science, providing industry with predictable, consistent, transparent, and efficient regulatory pathways, and assuring consumer confidence in devices marketed in the U.S."

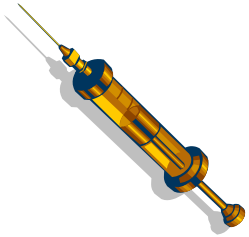
FDA's Challenge

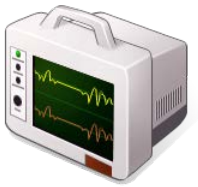
Safety
Effectiveness

Innovation
Availability

Medical Device: Regulatory Definition

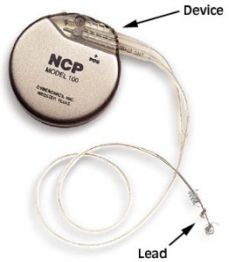
- Diagnoses, Cures, Mitigates, Treats or Prevents a Disease or Condition, **or**
- Affects the Function or Structure or the Body, **and**
- Does Not Achieve Intended Use Through Chemical Action, **and**
- Is Not Metabolized

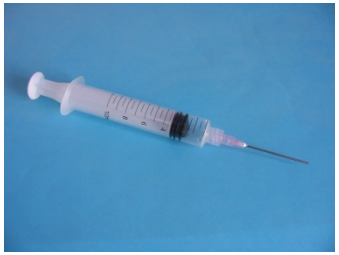


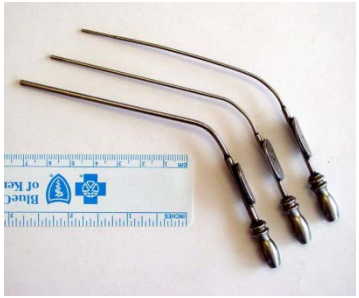


Food, Drug & Cosmetic Act: Section 210(h)

The Diversity of Medical Devices







Regulatory Classification for Devices

Medical Device Amendments of 1976:

Created a tiered, **risk-based** classification with regulatory requirements gauged to risks:

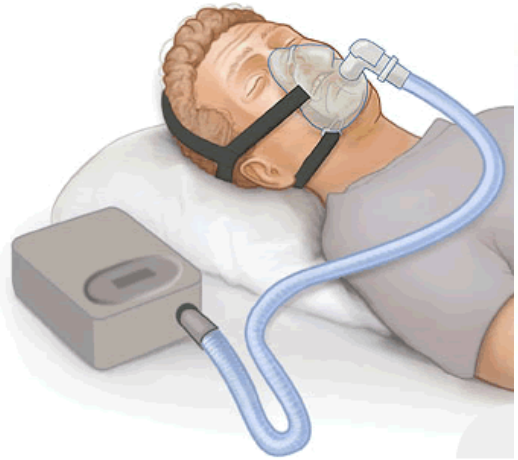
Class	Risk	Regulatory Requirements
Class I	Low	General Controls
Class II	Moderate	General Controls and Specific Controls
Class III	High	General Controls and Premarket Approval (PMA)

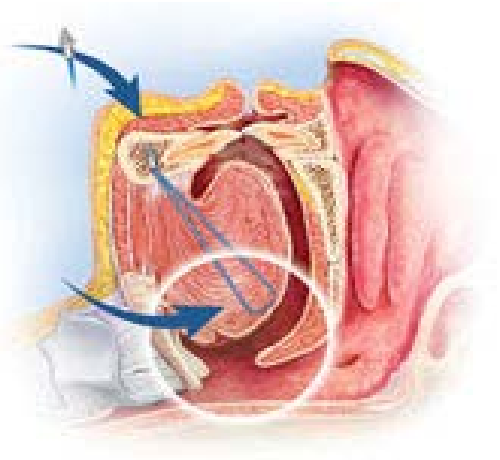
Class I (Low Risk):General Controls

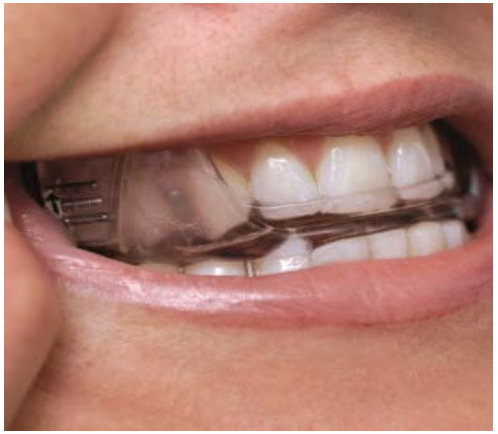
- prohibition of adulterated or misbranded devices
- GMPs
- Registration of manufacturing facilities
- Listing of device types
- Record keeping
- Repair, replacement, refund
- Premarket application to FDA usually NOT required

Class II (Moderate Risk): General Controls *plus* Special Controls

- Performance standards (e.g., ASA, ISO, ASTM)
- Guidance documents
- Device tracking
- Post-market surveillanc
- Most require **Premarket Notification** submission to FDA, i.e., **510(k)**







510(k) – Premarket Notification

Device must be shown to be

“Substantially Equivalent”

to a legally marketed *predicate device*

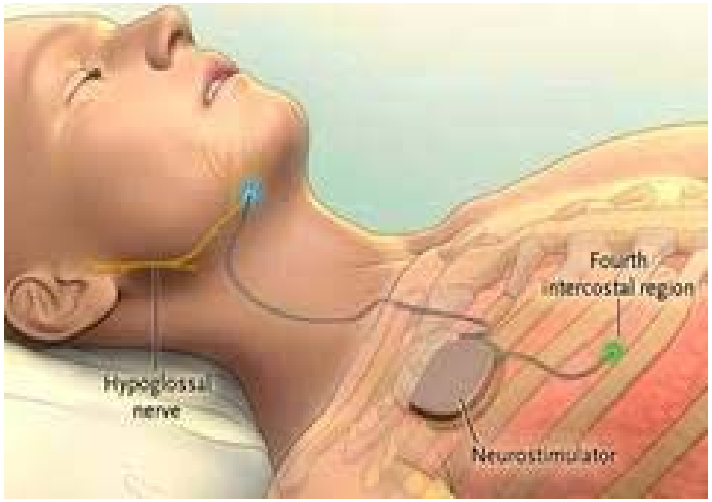
Substantial Equivalence

Has the same intended use, and:

- Has the same technological characteristics, or
- Has different technological characteristics and the information in the 510(k):
  - Does not raise different types of questions of safety and effectiveness, and
  - Performance data demonstrates that it is as safe and effective as the predicate
- Goal: Decision within 90 FDA review days
- Devices found substantially equivalent are FDA “cleared”, not approved.

Class III (High risk): General Controls *plus* Premarket Approval (PMA)

- Typically reserved for devices that:
  - support/sustain human life, or
  - substantial importance in preventing health impairment, or
  - potential, unreasonable risk of illness or injury
- Requires Premarket Approval (PMA)
- Final decision within 180 FDA review days in most cases



Class III (High Risk): PMA

In-depth review of:

- manufacturing & quality systems
- biocompatibility
- toxicology
- engineering
- sterility
- shelf life
- labeling
- clinical study
  - controls
  - detailed statistical analysis plan
- post-approval study

De Novo Pathway

- For new device type with low/moderate risk
  - No identifiable predicate device;
  - New intended use; or
  - Different technology that raises different types of questions of safety or effectiveness
- Requires sufficient understanding of risks/benefits in order to provide a reasonable assurance of safety and effectiveness through general controls, and, if necessary, and special controls
- Creates a new Class I or Class II device classification regulation
- Decision goal: within 150 FDA review days

SDB Device Examples by Class

Class	Device
Class I	External/internal nasal dilator
Class II	Apnea monitor Continuous positive airway pressure (CPAP) Electrosurgical devices Expiratory resistance valve Home sleep apnea testing (HSAT) Intraoral appliances Palatal implants Polysomnogram (PSG) Position pillow for OSA Tongue suspension suture
Class III	Implanted hypoglossal nerve stimulator

Summary: Regulatory Pathways to Market for SDB Devices

- General Controls only (for Class I--low risk devices)
- Premarket Notification / 510(k)
- Premarket Approval (PMA)
- De Novo Pathway

CDRH Databases for Clearances/Approvals

- 510(k) Clearances:
  - More information
- PMA Approvals:
  - More information
- De Novo Database:
  - More information

Programs to Promote Device Innovation in the United States

Early Feasibility Study (EFS) Program

- **Intent -** To facilitate the clinical evaluation of medical devices in the US
- **Scope -** Elements that define an early feasibility study:
  - Small number of subjects
  - Device that may be early in development, typically before the device design has been finalized
- **Key Guidance Principle -** Approval of an early feasibility study IDE may be based on less nonclinical data than would be needed to support the initiation of a larger clinical study on a more final device design
- **Program Features** – interactive review, EFS Program representative assistance, potentially less non-clinical data to support study initiation, new mechanisms to timely device and clinical protocol changes

Breakthrough Devices Program

- Intended to treat/dx life-threatening or irreversibly debilitating disease or condition
- Addresses an unmet medical need
- Sponsor provides a draft “Data Development Plan” describing proposed clinical and non-clinical data
- Features: interactive review, priority review, case manager/senior management involvement

Premarket Review Issues for SDB Devices

Premarket Review Issues for SDB Devices

- Varying definitions for key terms (e.g. OSA)
- Proposed use of novel, unvalidated indices for diagnosis or endpoints
- Differing technologies to diagnose SDB (e.g. PSG vs. HSAT)
- Variable number of channels being used for HSAT

Premarket Review Issues for SDB Devices (cont'd)

- Variable clinical study designs to support effectiveness of devices intended to treat SDB
  - Inconsistent effectiveness endpoints
  - Differing interpretations of clinically meaningful differences in effectiveness endpoints
  - Inconsistent timing of assessments (esp. for implanted devices)
  - Role of patient-reported outcomes (PROs) in the evaluation of SDB devices

Premarket Review Issues for SDB Devices (cont'd)

- Challenges associated with proposed use of digital health technology for screen/diagnosis of SDB

Goals for the SDB Workshop

- Obtain consensus on key definitions related to SDB
- Obtain expert recommendations re: the role of PSG vs. HSAT in the diagnosis/assessment of SDB
- Obtain expert recommendations on the design of clinical studies for devices intended to treat SDB
- Discuss safety and effectiveness concerns related to digital health devices intended to diagnose/monitor SDB
- Promote device development and innovation through consistency, predictability, and transparency of FDA clinical data requirements