

# Medical Device & Dietary Supplement Development

Pharm 309  
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Tom Hazlet

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## Objectives

- Continued from ...
- Understand the differences between the developmental demands and regulatory requirements for
  - Drugs & biologics
  - Medical devices
  - Dietary supplements

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## More Disasters ... Medical Device Amendments of 1976

- 1969 HEW survey: 10 years 10,000 injuries & 751 fatalities
- FDA survey: 858 deaths
- Independent survey 36,000 complications in one year

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## FDA History - Medical Device Amendments of 1976

- Dalkon Shield, an IUD, marketed w/o proper testing:
  - removal rate of 26.4%
  - an infection rate of 5%
  - 25 miscarriages, 16 deaths
- Cardiac pacemakers defects necessitated 30 recalls involving 23,000 units
- May 28, 1976

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## Differentiate drug & device Food, Drug & Cosmetic Act

- Drug/biologic 21USC201(g)(1)
  - USP/NF
  - **INTENDED** for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals; and
  - intended to affect the structure or any function of the body of man or other animals;
  - Component
  - Not food or dietary supplement
- Medical device 21USC201(h)(1)
  - USP/NF
  - **INTENDED** for use in the diagnosis of disease or other conditions ..., or
  - intended to affect the structure or any function ...,
  - does not achieve its primary intended purposes through chemical action within or on the body ... and which is not dependent upon being metabolized ....

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## FDA History - Medical Device Amendments of 1976

- **Key features of the 1976 Amendments**
  - Classification for regulatory purposes
  - Pre-market approval: implanted & life supporting devices
  - Interstate commerce is presumed in all cases
  - Authority to issue GMP's, Access to industry records
  - Registration and list, Authority to ban devices

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## Basis for Classification of Devices

- Amount of information known about device *for intended use & indications for use*
  - Scalpel: intended use - cut tissue. Indication in labeling "for making incisions in the cornea".
- What level of controls are necessary to assure Safety & Effectiveness of device
- Support or sustain human life OR important in preventing impairment of human health
- Risk of causing illness or injury

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## Medical Device Classification & Regulatory Requirements

- Class I - General Controls (with & w/o exemptions)
- Class II – General Controls and Special Controls (with & w/o exemptions)
- Class III – General Controls and Premarket Approval

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## [ Class I - General Controls ]

- Known information provides reasonable assurance of safety & effectiveness using General Controls

OR

- Known information does not assure S & E, BUT the device
  - Does not support or sustain human life, OR
  - Is not used to prevent impairment of human health AND
  - No unreasonable risk of illness or injury

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## [ Examples of Class I Devices ]

- Examination Gloves 21CFR880.6250
- Dental Hand Instrument 21CFR872.4565
- Elastic Bandages 21CFR880.5075
- Pacemaker Charger 21CFR870.3670
- Ultrasonic Cleaner for Medical Instruments 21CFR880.6150
- Hand-held (Manual) Surgical Instruments 21CFR878.4800

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## [ Class II - Special Controls ]

- General Controls alone are insufficient to provide assurance of Safety & Effectiveness
  - BUT
- Information exists to establish Special Controls

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## [ Special Controls ]

- General Controls +
  - Special Labeling Requirements
  - Performance Standards
  - Postmarket Surveillance
  - Patient Registries
  - Guidelines, Recommendations
  - Any other appropriate actions

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## [ Examples of Class II Devices ]

- Cardiac Monitor 21CFR870.2300
- Elbow Joint Metal/Polymer Constrained Cemented Prosthesis 21CFR888.3150
- Pediatric hospital bed 21CFR880.5140
- Infusion Pump 21CFR880.5725
- Powered Wheelchair 21CFR890.3860
- Surgical Drapes 21CFR878.4370
- TENS device 21CFR882.5890

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## [ Class III - Premarket Approval ]

- Not enough information to classify as either Class I or II
- Device usually supports/sustains life,
- is of substantial importance in preventing impairment of human health or
- presents a potential, unreasonable risk of illness or injury

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## [ Premarket Approval (PMA) ]

- Extensive submission including data showing Safety & Effectiveness
- Conditions of Approval
- Annual Reports

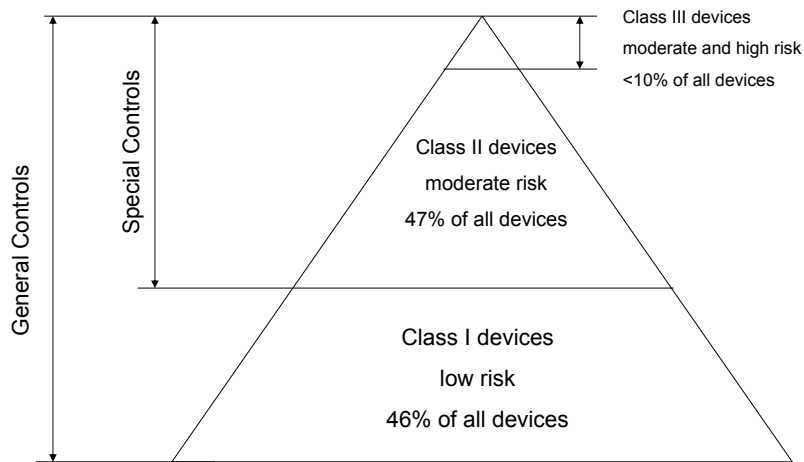
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## [ Examples of Class III Devices ]

- Implantable pacemaker pulse generator 21CFR870.3610
- Replacement heart valve 21CFR870.3925
- Cranial electrotherapy 21CFR882.5800
- Implanted electrical urinary continence device 21CFR876.5270
- Silicone gel-filled breast implant 21CFR878.3540
- Implanted cerebella stimulator 21CFR882.5820

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## Device Pyramid (Classification)

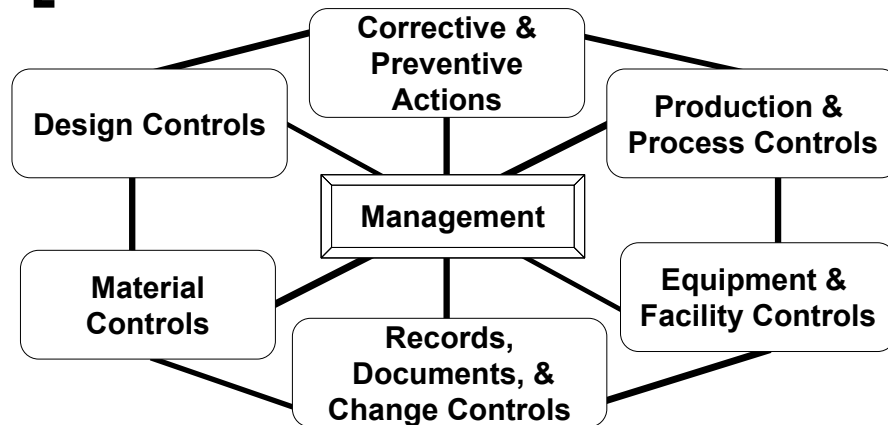


## QSIT Quality System Inspection Technique

- Management Controls
- Design Controls
- Corrective and Preventive Actions (CAPA)
- Production and Process Controls
- Risk Analysis
- Design & Process
  - Verification
  - Validation

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## 7 Subsystems of a Quality System



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## More history; different kind of disaster Dietary Supplement & Health Education Act of 1994

- 1976 VITAMINS AND MINERALS AMENDMENTS
  - "Proxmire Amendments" stop FDA from establishing standards limiting potency of vitamins and minerals in food supplements or regulating them as drugs based solely on potency.
- 1989 FDA issued a nationwide recall of all over-the-counter dietary supplements providing 100 milligrams or more of L-TRYPTOPHAN.
- 1990 NUTRITION LABELING AND EDUCATION ACT
- 1994 DIETARY SUPPLEMENT HEALTH AND EDUCATION ACT (DSHEA)
  - specific labeling requirements,
  - provides a regulatory framework,
  - good manufacturing practice regulations
  - commission to recommend how to regulate claims.

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## Dietary Supplement Food, Drug & Cosmetic Act – 21USC201(ff)

- product (other than tobacco) **intended to supplement the diet** that bears or contains one or more of the following dietary ingredients:
  - (A) a vitamin;
  - (B) a mineral;
  - (C) an herb or other botanical;
  - (D) an amino acid;
  - (E) a dietary substance for use by man [but no other animals] to supplement the diet by increasing the total dietary intake; or
  - (F) a concentrate, metabolite, constituent, extract, or combination of any ingredient described in clause (A), (B), (C), (D), or (E);

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## DSHEA-2

- intended for ingestion in pill, capsule, tablet, or liquid form.
- not represented for use as a conventional food or as the sole item of a meal or diet.
- is labeled as a "dietary supplement."

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## Dietary Supplement Regulatory Requirements

- No pre-market notification except for "new dietary ingredient"
  - Grandfathered all ingredients available through 10/15/94
  - Vetting for "new dietary ingredients"
  - Demonstration that product is unsafe for regulatory action
- Manufacturer/distributor responsible for safety and claims/representations made on label or in labeling
- No manufacturer/distributor registration

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## DSHEA Labeling Requirements

- Descriptive name, including "supplement"
- Place of manufacture, etc.
- Complete list of ingredients
- Net quantity of contents
- NLEA-compliant "supplement facts" panel
- Certain "structure/function" claims permitted
  - Vitamin C – scurvy
  - Calcium – osteoporosis
- Otherwise, disclaimer required when claim is made
  - "This claim has not been evaluated by the FDA. This product is not intended to diagnose, treat, cure, or prevent any disease"

<http://vm.cfsan.fda.gov/~dms/supplmnt.html>

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## [ Is Something Missing? ]

- Medical Products?
- Dietary Supplements?

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## [ Summing Up ]

- where was the science?
- phases of drug, device, dietary supplement development
- major regulatory events
- questions

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