FDA Overview and Osseointegration

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Presentation Outline

• FDA at a Glance
• Regulatory Classification and Pathway
• Current Regulatory Landscape
• Research
• Questions
FDA’s Mission

- Protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices; and by ensuring the safety of our nation's food supply, cosmetics, and products that emit radiation.

- Responsible for advancing the public health by helping to speed innovations that make medical products more effective, safer, and more affordable and by helping the public get the accurate, science-based information they need to use medical products and foods to maintain and improve their health.

https://www.fda.gov/about-fda/what-we-do
FDA REGULATION AT A GLANCE: HUMAN PRODUCTS

- More than 19,000 prescription drug products subject to FDA regulation
- More than 6,000 medical device product categories under FDA oversight
- More than 85,000 tobacco products, not including e-liquids
- Approximately 340 FDA-licensed biologics
- More than 190,000 FDA-registered facilities for human foods

FDA REGULATION AT A GLANCE: ANIMAL PRODUCTS

- More than 1,600 animal drug products
- More than 24,000 registered facilities for animal foods

FDA-regulated products account for about 20 CENTS of every dollar spent by U.S. consumers.

https://www.fda.gov/AboutFDA/Transparency/Basics/ucm553033.htm
## FDA-Registered Facilities

<table>
<thead>
<tr>
<th>Program</th>
<th>Domestic</th>
<th>Foreign</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Drugs</td>
<td>1,403</td>
<td>385</td>
<td>1,788</td>
</tr>
<tr>
<td>Animal Food</td>
<td>17,941</td>
<td>6,636</td>
<td>24,577</td>
</tr>
<tr>
<td>Biologics</td>
<td>6,336</td>
<td>660</td>
<td>6,996</td>
</tr>
<tr>
<td>Human Drugs</td>
<td>3,204</td>
<td>7,147</td>
<td>10,351</td>
</tr>
<tr>
<td>Human Food</td>
<td>84,838</td>
<td>108,539</td>
<td>193,377</td>
</tr>
<tr>
<td>Medical Devices</td>
<td>13,790</td>
<td>13,110</td>
<td>26,900</td>
</tr>
<tr>
<td>Tobacco</td>
<td>3,039</td>
<td>0</td>
<td>3,039</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>130,551</strong></td>
<td><strong>136,477</strong></td>
<td><strong>267,028</strong></td>
</tr>
</tbody>
</table>
FY 2018 FDA Budget by Program (Total = $5.4 billion)

- Human Drugs: 30.2%
- Devices & Radiological Health: 9.5%
- Foods: 19.6%
- Tobacco: 11.7%
- Animal Drugs & Feeds: 3.7%
- Toxicological Research: 1.2%
- Other Programs: 3.3%
- FDA Headquarters: 6.3%
- Infrastructure: 7.9%
- Biologics: 6.7%

https://www.fda.gov/AboutFDA/Transparency/Basics/ucm553038.htm
FDA Organizational Chart

17,468 Full-Time Employees (not include contractors, fellows)
• 1827 CDRH

https://www.fda.gov/AboutFDA/Transparency/Basics/ucm213161.htm
https://www.fda.gov/AboutFDA/CentersOffices/OrganizationCharts/ucm393155.htm
CDRH Reorganization
### Regulation Medical Specialty

- Classified within 16 medical specialties (21 CFR 862-892):

<table>
<thead>
<tr>
<th>Code</th>
<th>Specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>862</td>
<td>Chemistry/Toxicology</td>
</tr>
<tr>
<td>864</td>
<td>Hematology/Pathology</td>
</tr>
<tr>
<td>866</td>
<td>Immunology/Microbiology</td>
</tr>
<tr>
<td>868</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>870</td>
<td>Cardiovascular</td>
</tr>
<tr>
<td>872</td>
<td>Dental</td>
</tr>
<tr>
<td>874</td>
<td>Ear, Nose and Throat</td>
</tr>
<tr>
<td>876</td>
<td>Gastro/Urology</td>
</tr>
<tr>
<td>878</td>
<td>General Plastic Surgery</td>
</tr>
<tr>
<td>880</td>
<td>General Hospital</td>
</tr>
<tr>
<td>882</td>
<td>Neurological</td>
</tr>
<tr>
<td>884</td>
<td>Obstetrical/Gynecological</td>
</tr>
<tr>
<td>886</td>
<td>Ophthalmic</td>
</tr>
<tr>
<td>888</td>
<td>Orthopedic</td>
</tr>
<tr>
<td>890</td>
<td>Physical Medicine</td>
</tr>
<tr>
<td>892</td>
<td>Radiology</td>
</tr>
</tbody>
</table>

http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/ClassifyYourDevice/ucm051530.htm
# Classes of Medical Devices

<table>
<thead>
<tr>
<th>Class</th>
<th>Risk</th>
<th>Controls</th>
<th>Submission Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Lowest</td>
<td>General</td>
<td>• Exempt</td>
</tr>
<tr>
<td>II</td>
<td>Moderate</td>
<td>General and Special (if available)</td>
<td>• Exempt • 510(k) • De Novo</td>
</tr>
<tr>
<td>III</td>
<td>Highest</td>
<td>General and PMA</td>
<td>• PMA • HDE (see slide 12)</td>
</tr>
</tbody>
</table>

References:
- [https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/GeneralandSpecialControls/default.htm](https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/GeneralandSpecialControls/default.htm)
- [https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/ClassifyYourDevice/ucm051549.htm](https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/ClassifyYourDevice/ucm051549.htm)
Regulatory Pathways

• **510(k)**
  – Demonstration of substantial equivalence (SE) to legally marketed devices
  – Existence of predicate device
  – Clinical data not usually required, but may be necessary for select submissions

• **De Novo**
  – Pathway to classify novel medical devices for which general controls alone, or general and special controls, provide reasonable assurance of safety and effectiveness for the intended use, but for which there is no legally marketed predicate device.
  – Novel low to moderate risk devices

• **PMA**
  – Highest risk, general and special controls alone are insufficient
  – Demonstration of reasonable assurance of safety and effectiveness
  – Clinical data is usually necessary

https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/HowtoMarketYourDevice/PremarketSubmissions/default.htm
Humanitarian Device Exemption (HDE)

- **21 CFR 814 Subpart H**
  - Patient population of <8,000 individuals in the United States per year
  - No comparable devices are available to treat or diagnose the disease or condition
  - Does not pose unreasonable risk of illness or injury (i.e., safety is demonstrated), AND
  - Probable benefit outweighs the risk (i.e., exempt from effectiveness requirements of a PMA)
  - Compliance with the QS regulation at 21 CFR Part 820
  - IRB approval
  - Except in certain circumstances, HDE cannot be sold for an amount that exceeds the costs of research and development, fabrication, and distribution of the device (i.e., for profit).

[https://www.fda.gov/medicaldevices/deviceregulationandguidance/howtomarketyourdevice/premarketsubmissions/humanitariandeviceexemption/default.htm](https://www.fda.gov/medicaldevices/deviceregulationandguidance/howtomarketyourdevice/premarketsubmissions/humanitariandeviceexemption/default.htm)
Current Regulatory Landscape

• Only the OPRA transfemoral device approved through HDE pathway
• No OI devices approved for marketing for transhumeral use
• Where you may have seen other devices
  – Patients in clinical trials
  – Custom device
  – Compassionate use
  – Out of country treatment

OPRA: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfhde/hde.cfm?id=H080004
Compatibility with Prosthesis

• Are only specific prosthetic products or devices approved to be fit with specific O.I. devices?
  – Please follow-up with manufacturer
  – Integrum OPRA Labeling:

ii) Axor provides a standard connection to other prosthetic components that would include the prosthetic knee and foot. A standard European 4 hole male/female mounting system is utilized. This allows the OPRA system to be connected to all prosthetic systems that utilize this standardized connection method. The OPRA System is recommended for use with commercially available non-microprocessor controlled prosthetic knees and microprocessor controlled prosthetic knees that do not include powered activation of flexion and extension of the prosthetic knee.

https://www.accessdata.fda.gov/cdrh_docs/pdf8/H080004S002C.pdf
General CDRH Resources

• Regulatory Assistance
  – DICE@fda.hhs.gov
  – https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance
  – https://www.fda.gov/Training/CDRHLearn/default.htm

• Q-Submission Program

• Medical Device Reporting (MDR) and Manufacturer and User Facility Device Experience (MAUDE)
  – https://www.fda.gov/medicaldevices/safety/reportaproblem/default.htm#howtoreport