Incorporating a Total Product Lifecycle (TPLC) Approach

FDA Small Business
Regulatory Education for Industry (REdI)
Boston, MA
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Learning Objectives

- Review recent FDA initiatives to foster device innovation and safety
- Explain how FDA is taking a Total Product Lifecycle (TPLC) approach to medical device regulation and why it's important
- Discuss CDRH's TPLC reorganization

Patients are at the Heart of What We Do

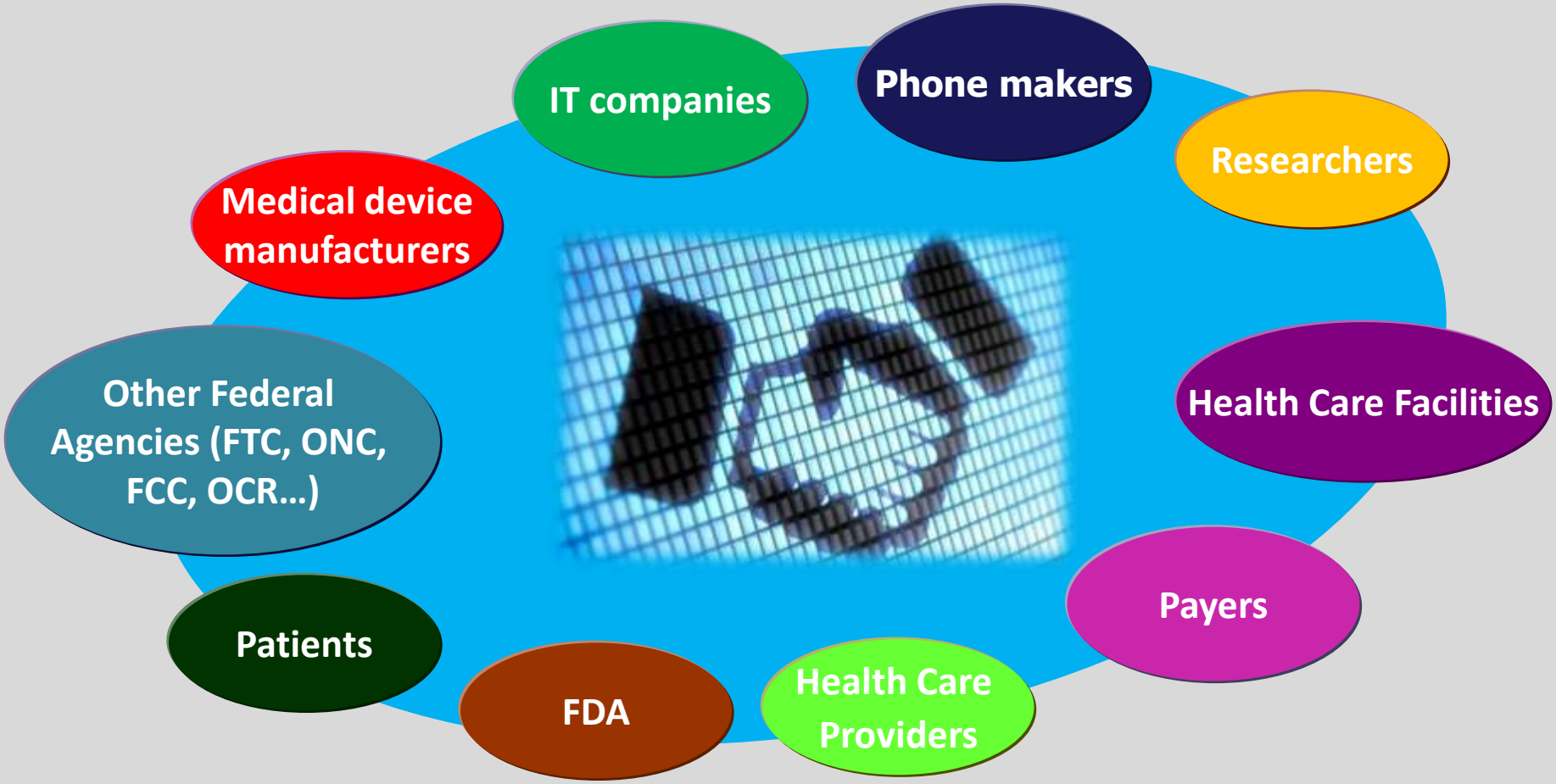
CDRH Vision

Patients in the U.S. have access to high-quality, safe, and effective medical devices of public health importance first in the world

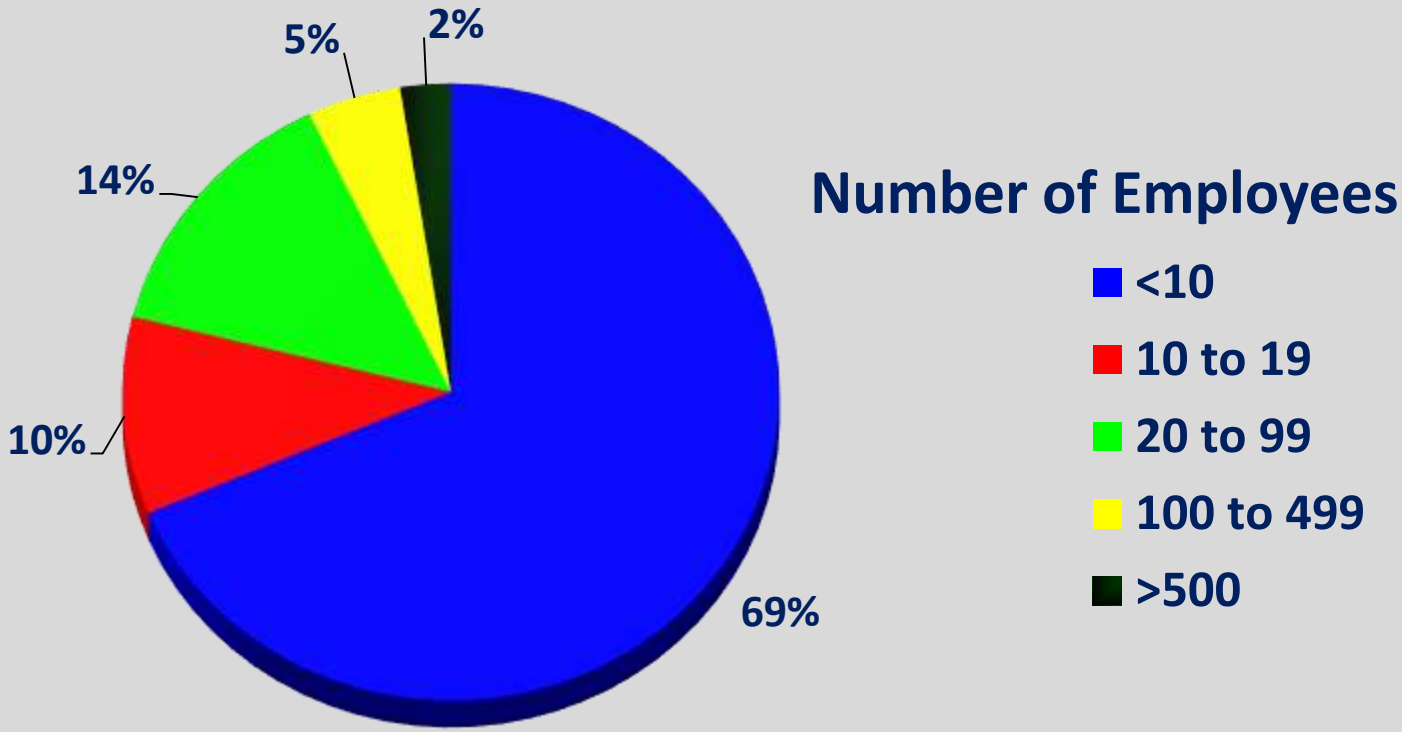
CDRH Vision

- Patients in the U.S. have access to high-quality, safe, and effective medical devices of public health importance first in the world.
- The U.S. is the world's leader in regulatory science, medical device innovation and manufacturing, and radiation-emitting product safety.
- **U.S. post-market surveillance quickly identifies poorly performing devices, accurately characterizes real-world performance, and facilitates device approval or clearance.**
- Devices are legally marketed in the U.S. and remain safe, effective, and of high-quality.
- Consumers, patients, their caregivers, and providers have access to understandable science-based information about medical devices and use this information to make health care decisions.

Many New (and Some Old!) Stakeholders

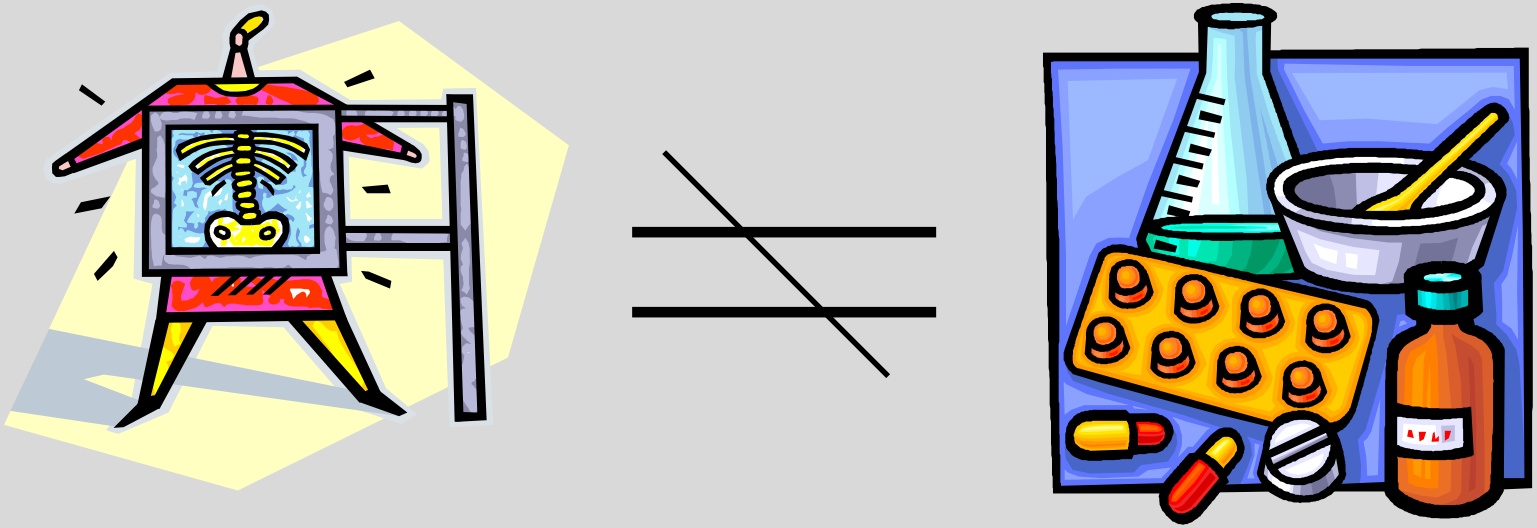


Medical Device Manufacturers By Number of Employees



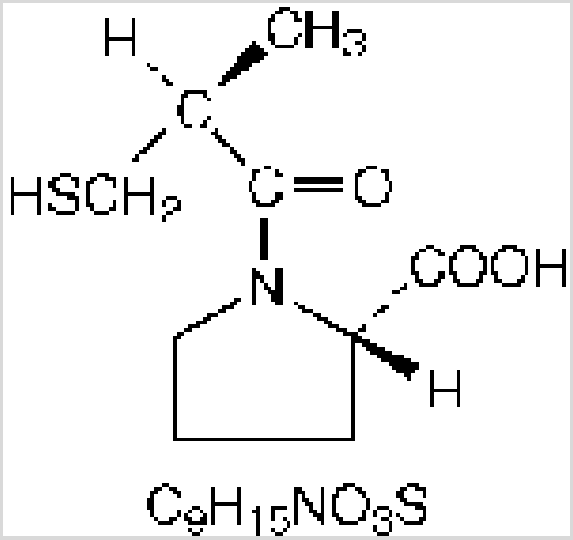
Source: Dun and Bradstreet, Inc.

Devices are not Drugs

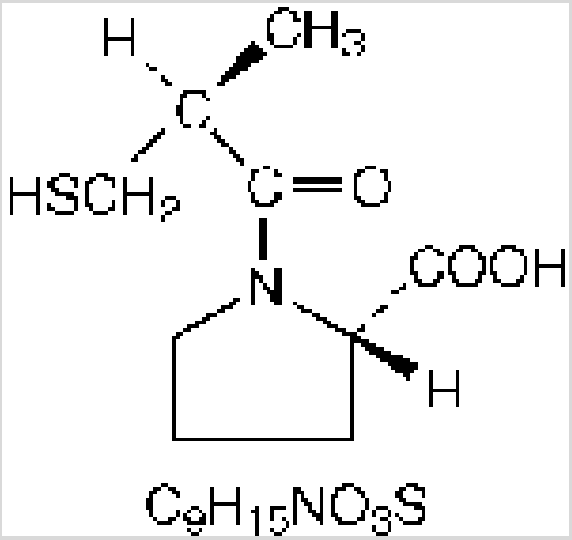


CAPTOPRIL

FDA Approval
June 1981



Currently
Marketed Drug

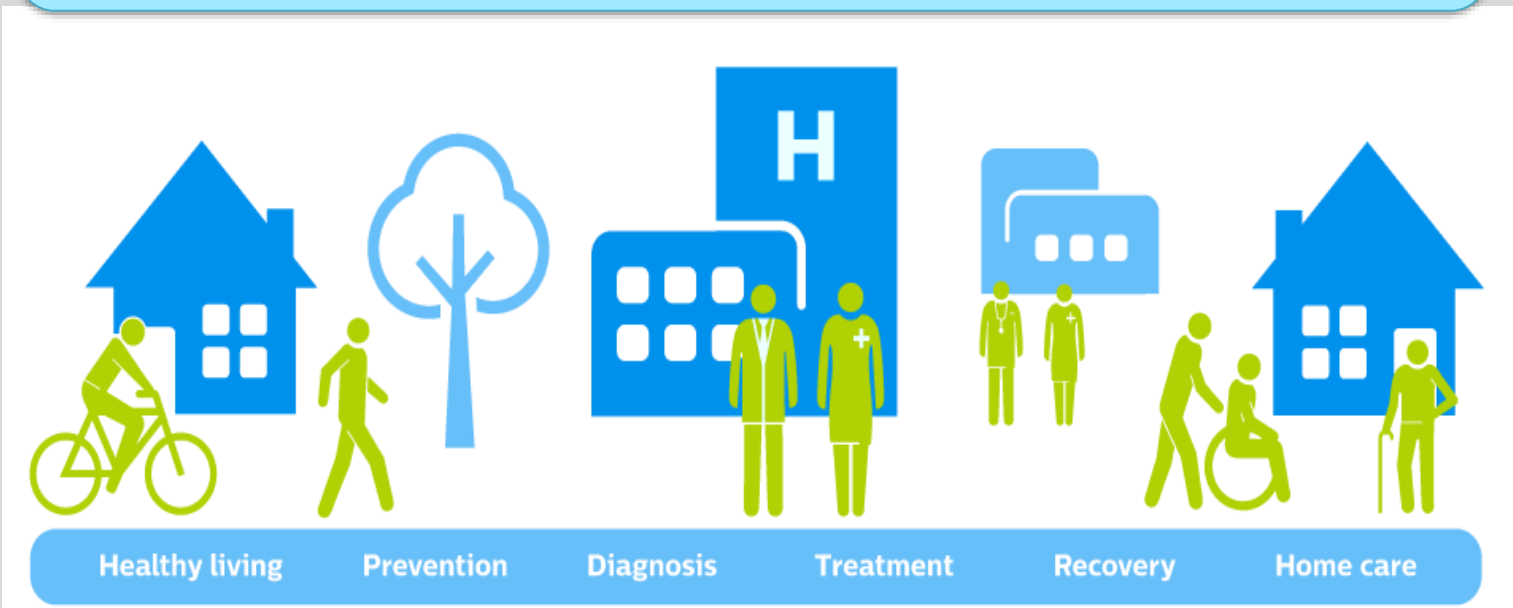


1-[(2S)-3-mercapto-2-methylpropionyl]-L-proline

Implantable Defibrillators (1989-Present)

Health Care Delivery Is Changing

Leveraging **computing power,** **sensors,**
connectivity ***and*** **software**



Moving health care from the Clinic to the Home

Understanding disease progression and patient behavior "*In the wild*"

Making use of "big data"

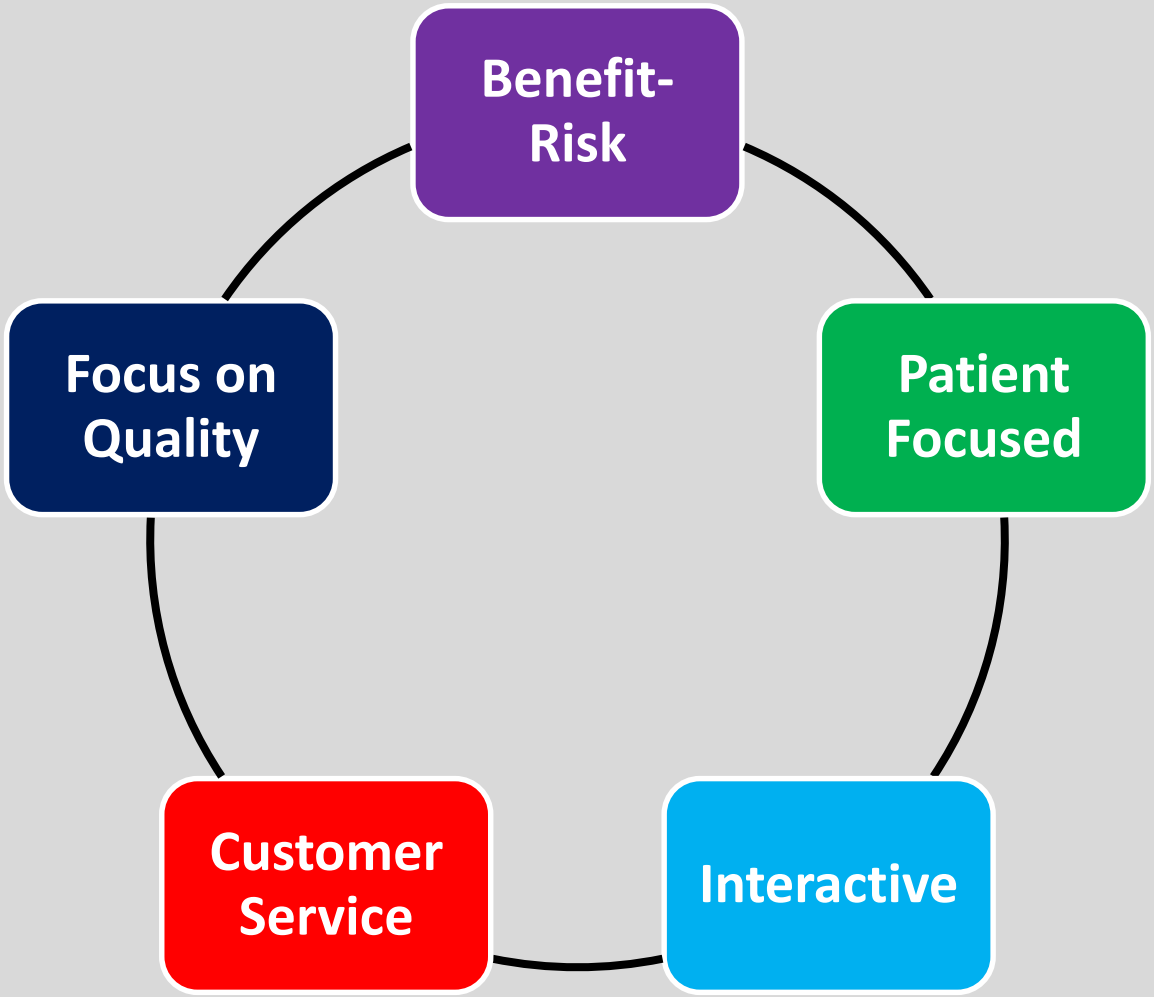
Time Is Money

Estimated Cost of FDA Decisions on a 30 Employee Company

	Expense to Company
8 Week Delay in Scheduling a Meeting	$1.8 M
Additional 20 Animal Study (6 months)	$5.5 M
Extra Year in Negotiating an IDE	$10.8 M
Additional 100 patient study with 1 year Follow-up (24 months)	$24.1 M

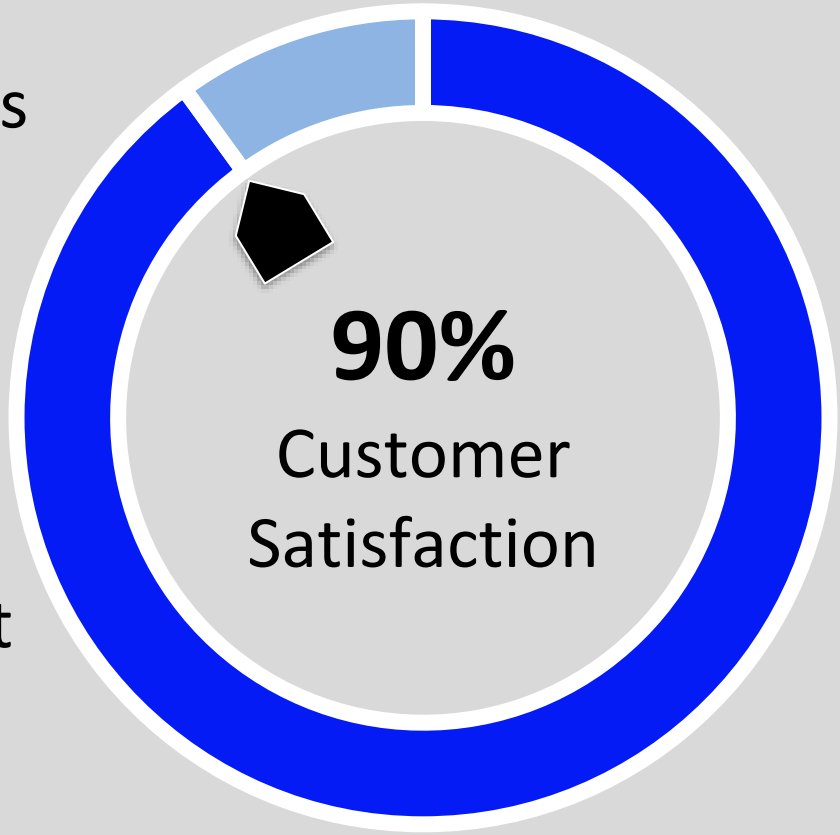
Source: Versant Ventures

Philosophies For Success

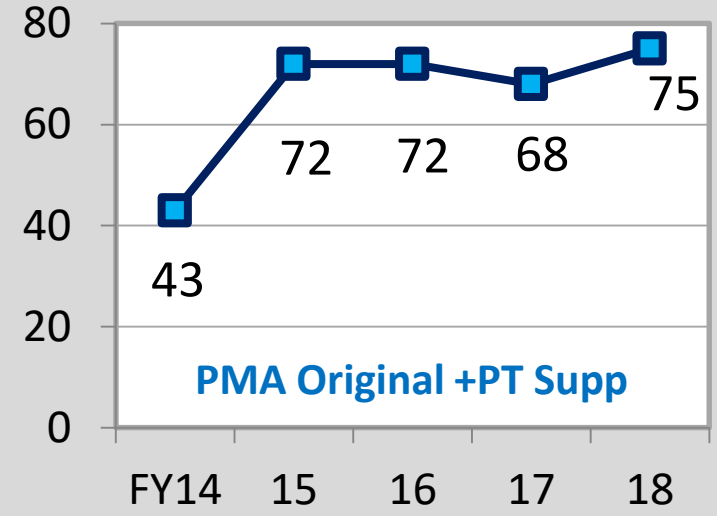


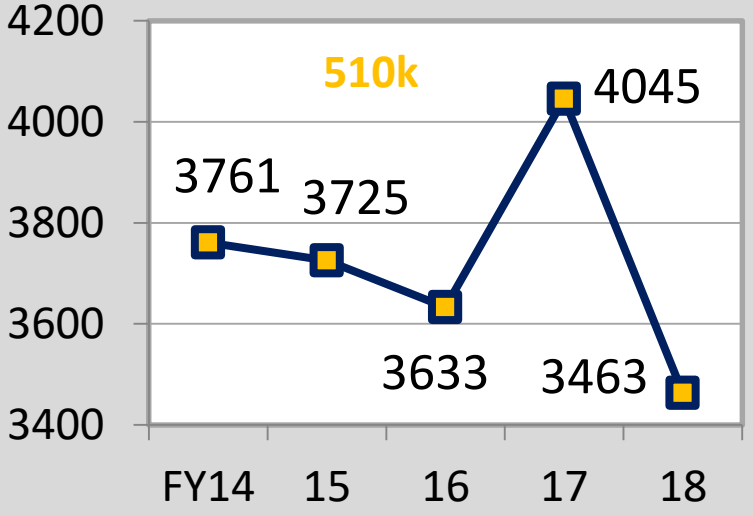
Customer Service Oriented

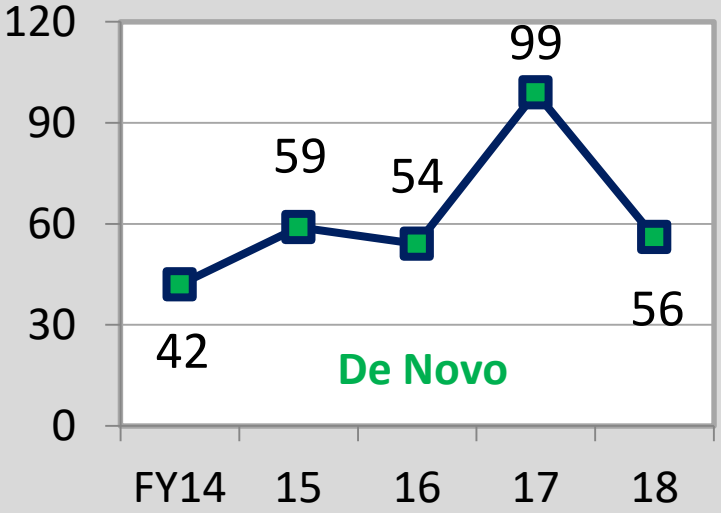
- Customer Service Standards of Excellence
- Customer Service Training
- Customer Service Surveys
- FEEDBACK✓CDRH
- CDRH Quality Management Framework

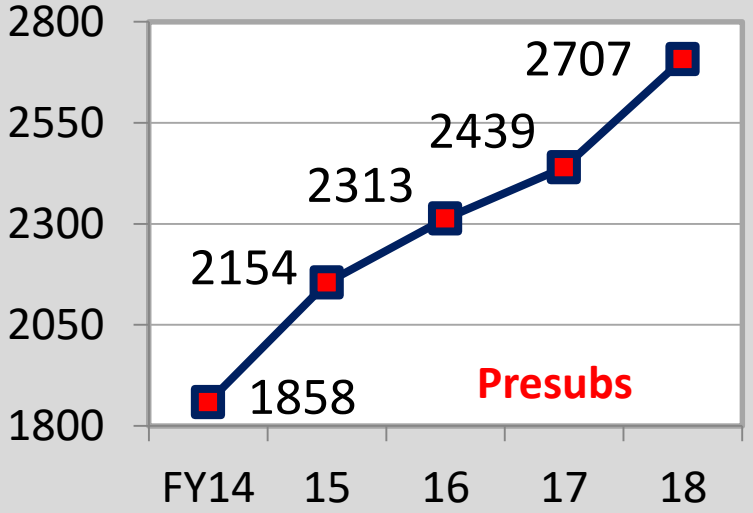


MDUFA Submission Volume



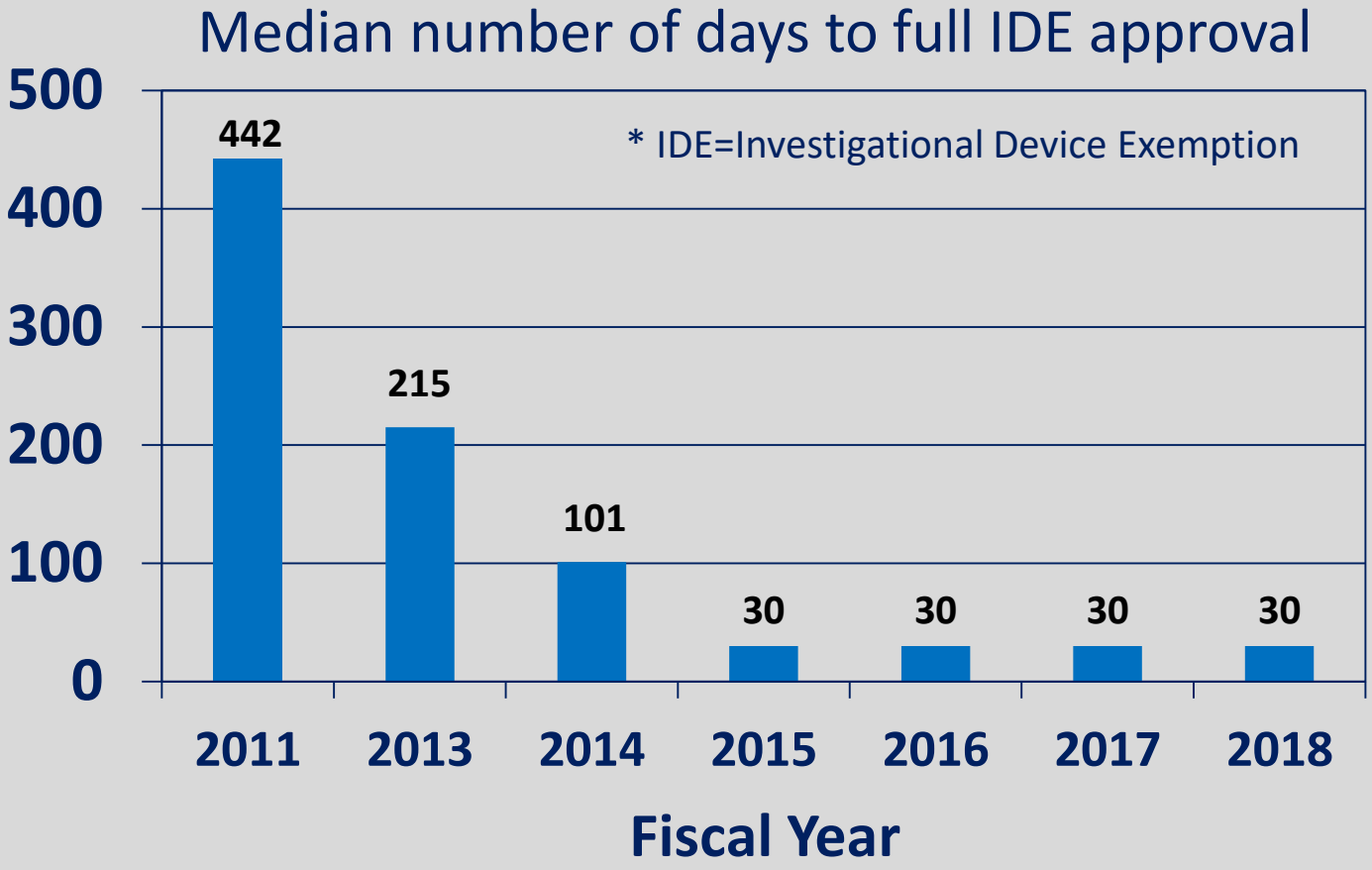






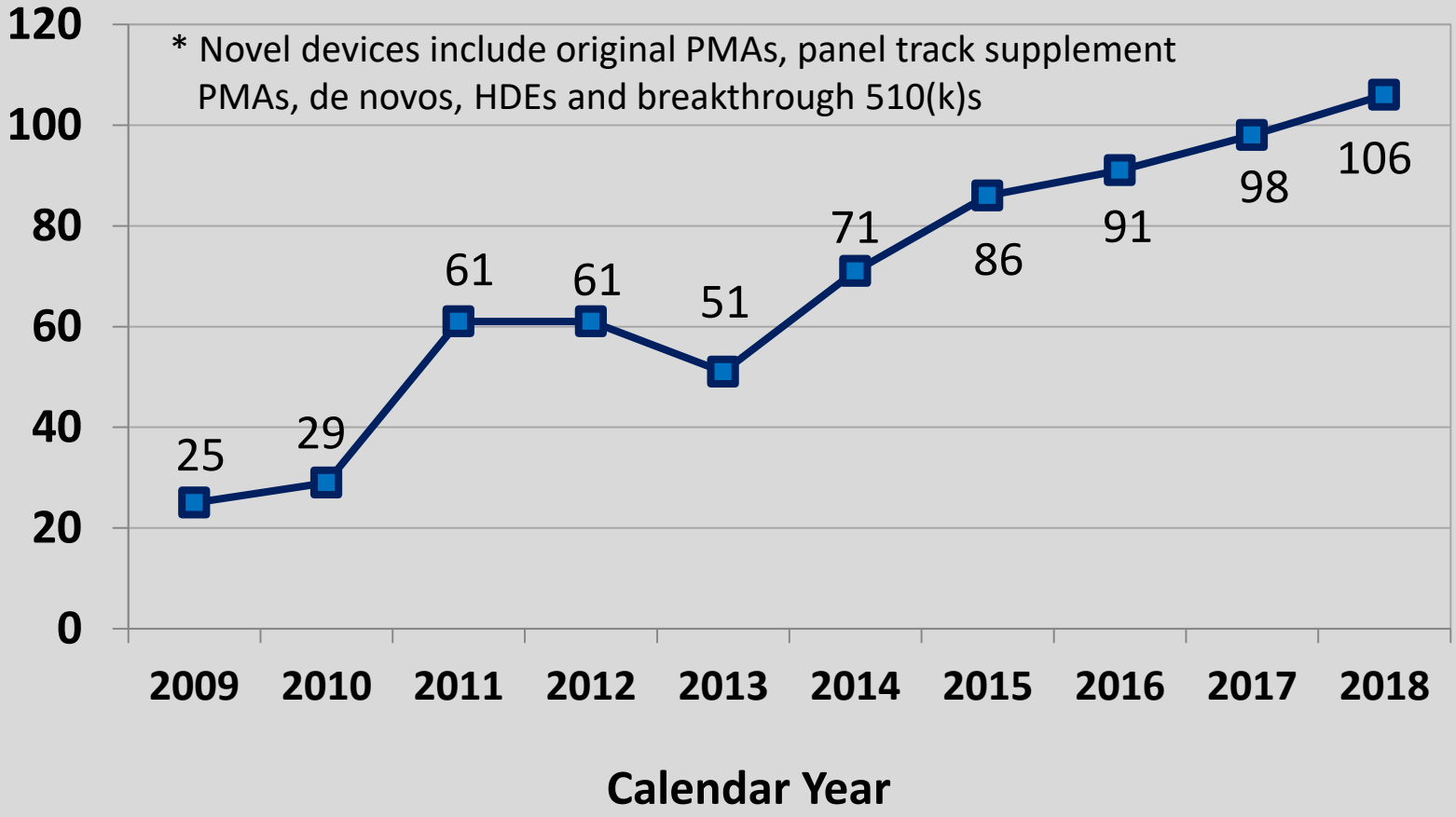
Clinical Trials (IDEs)*

>90% Reduction in Time to IDE Approval



Novel Device Approvals

>4-fold Increase in # of Novel Device Approvals



Breakthrough Device Pathway

(Formerly Expedited Access Pathway)

Breakthrough Devices Program

Guidance for Industry and Food and Drug Administration Staff

Document issued on December 18, 2018.

- Interactive & Timely Communication
- Pre-Postmarket Balance
- Flexible Clinical Study Design
- Senior Management Engagement
- Priority Review

149 devices accepted into the program since April 2015

1st breakthrough device approved December 2017

11 breakthrough devices granted marketing authorization

Value of Patient Input and Engagement

Patients today:

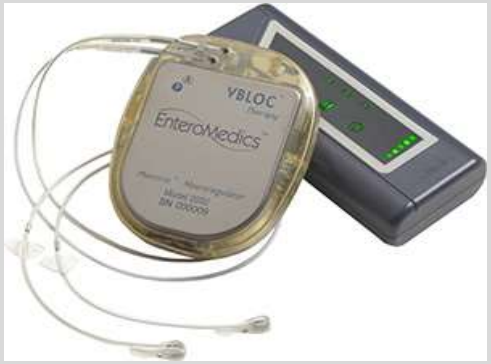
- More involved in shared decision-making and disease management
- Increasingly use devices at home
- Communicate and connect to share information with other “real-world patients”

Regulatory Impact of Patient Preference Information

FDA News Release

FDA approves first-of-kind device to treat obesity

SHARE TWEET + EMAIL



Enteromedics Maestro Rechargeable System

NxSTAGE

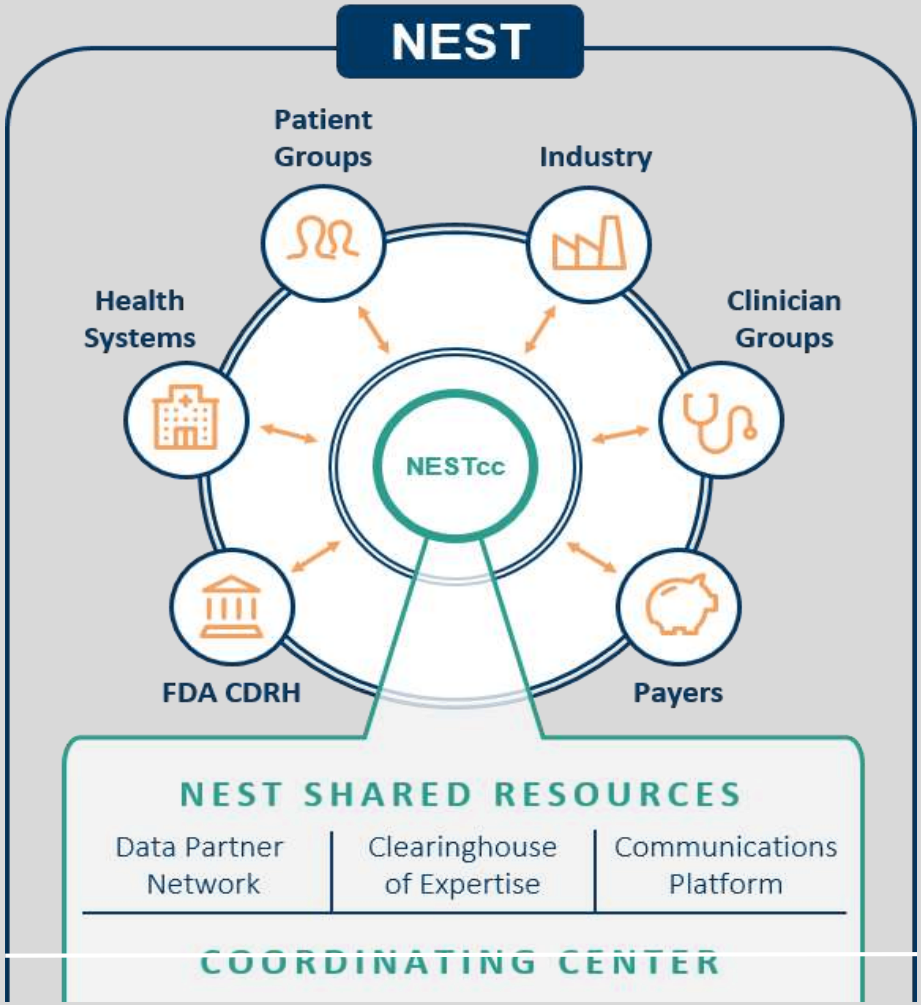
Aug 28, 2017
Previous Release

NxStage Medical Announces FDA Clearance for Solo Home Hemodialysis Using NxStage® System One™

First clearance of its kind gives trained NxStage patients freedom to dialyze without a care partner

LAWRENCE, Mass., Aug. 28, 2017 /PRNewswire/ -- NxStage Medical, Inc. (Nasdaq: NXTM), a leading medical technology company focused on advancing renal care, today announced that the U.S. Food and Drug Administration (FDA) has cleared its System One for solo home hemodialysis, without a care partner, during waking hours.

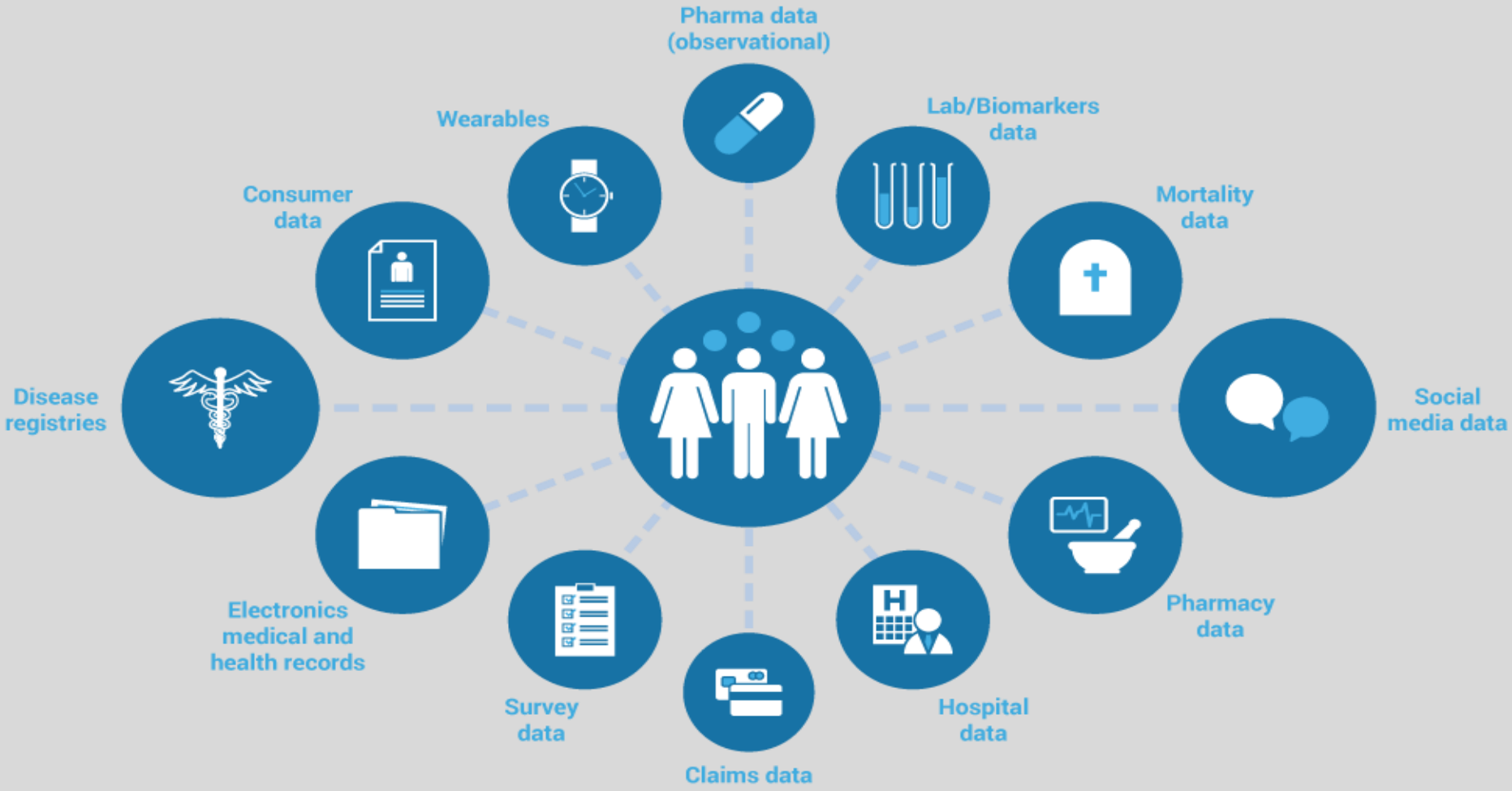
National Evaluation System for health Technology



NEST
National Evaluation System for health Technology
Coordinating Center

MDIC
MEDICAL DEVICE INNOVATION CONSORTIUM

Use of Real World Data



FDA Guidance (August 31, 2017)

Use of Real-World Evidence to Support Regulatory Decision-Making for Medical Devices

Opportunities To Obtain Payer and Health Technology Assessment Input

- ✓ Voluntary Opportunity to Obtain Private Payer Input

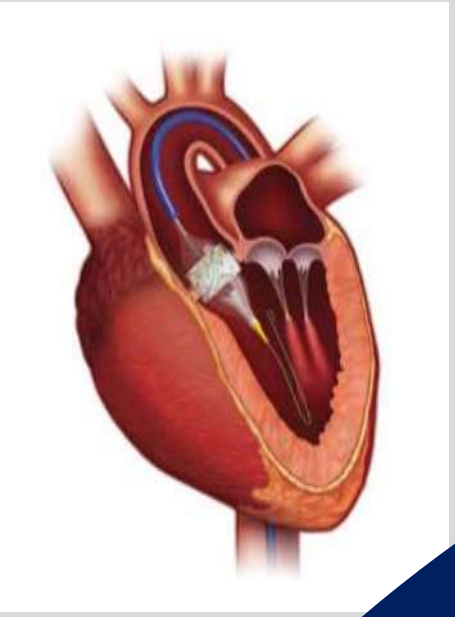
Current Participants:

- BlueCross BlueShield Association
- CareFirst BlueCross BlueShield
- Cigna
- Duke Evidence Synthesis Group/DCRI
- ECRI Institute
- Humana
- Kaiser Permanente
- National Institute for Health and Care Excellence
- United Health Group

Obtain input on clinical trial design or other plans for gathering clinical evidence

For more information: Google Search "CDRH Payer Program"

Transcatheter Heart Valves
The Road from 42nd



U.S. 42nd Country to Approve a 1st Generation TAVR Device

TVT Registry Established at Time of Device Approval

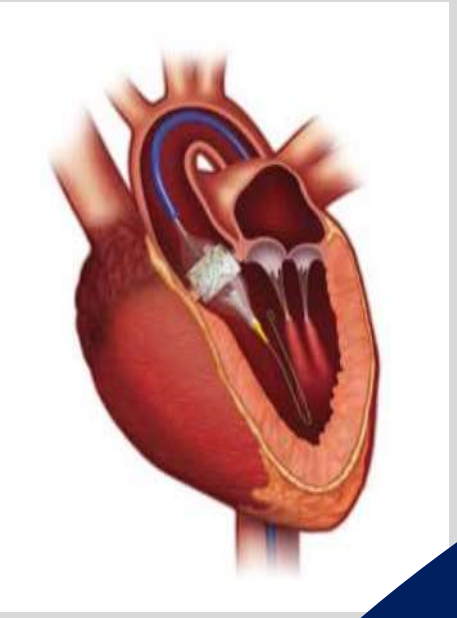
CMS NCD FDA approval of subsequent indications automatically covered

TVT Registry Used to Support Approval of Subsequent Indications and Device Generations

3rd Generation TAVR for Intermediate Risk 18 days after CE Mark for similar device

Mitral Valve-in-Valve 1st in World

Transcatheter Heart Valves
The Road from 42nd



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Mitral Valve-in-Valve 1st in World

Return on Investment (ROI)

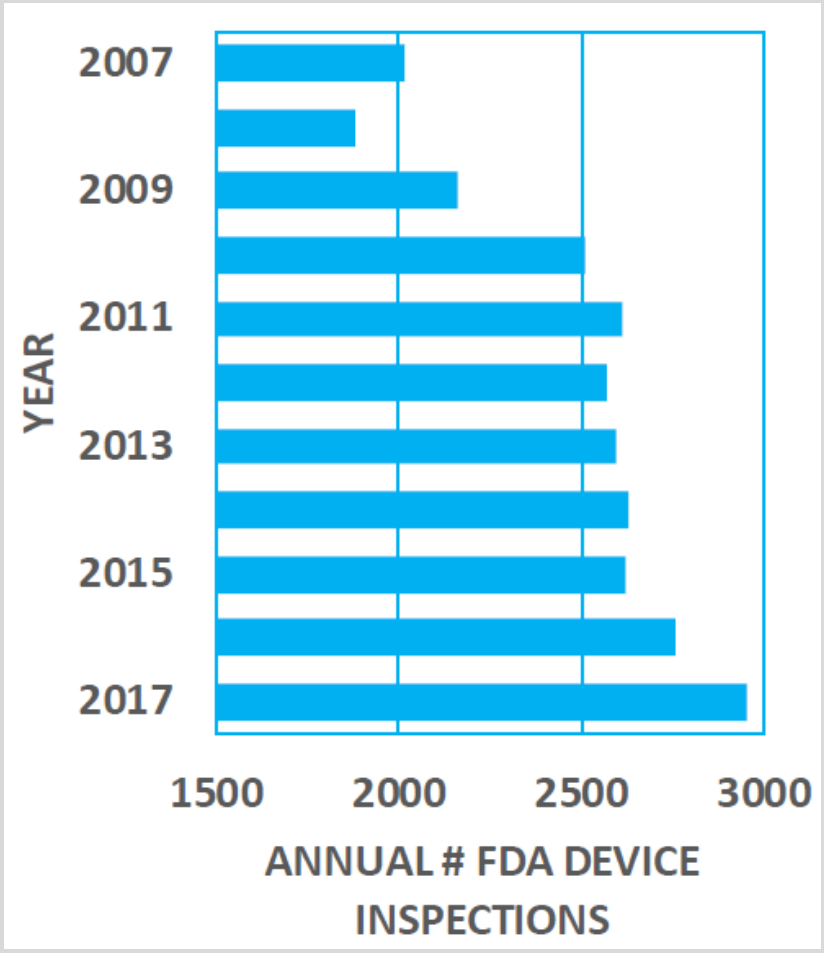
3 companies invested total of $24M

19 Decisions: Studies would have cost ~$147M

ROI > 400%

The Challenge

FDA Device Inspections



46% INCREASE

IN THE ANNUAL NUMBER OF DEVICE INSPECTIONS SINCE 2007.

243% INCREASE

IN THE ANNUAL NUMBER OF FOREIGN DEVICE INSPECTIONS SINCE 2007.

Firms are 8 times more likely to report a recall after 21 CFR 806 violations

Firms report 3 times more adverse events following 21 CFR 803 violations

Novel Approaches to Promoting Product Quality

Case for Quality 2011

MDIC Collaborative Forum 2014

Voluntary Quality Maturity Appraisal Pilot 2018

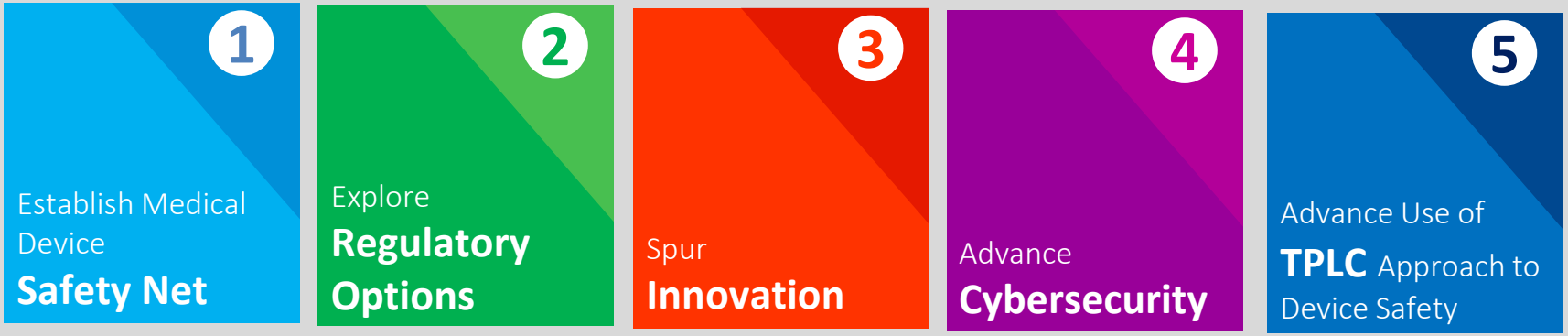
- Third-party certified by Capability Maturity Model Integration Institute (CMMI) conducts appraisal
- Collaboration and feedback on quality objectives
- Removal from the surveillance work plan
- Reduction in manufacturing submission requirements and faster approval for implementation
- Waive some pre-approval inspections

- ✓ 18 participating firms
- ✓ 32 appraisals
- ✓ 86% report appraisal had a positive impact on product quality

Medical Device Safety Action Plan

Outlines a vision for how CDRH can continue to enhance our programs and processes to assure:

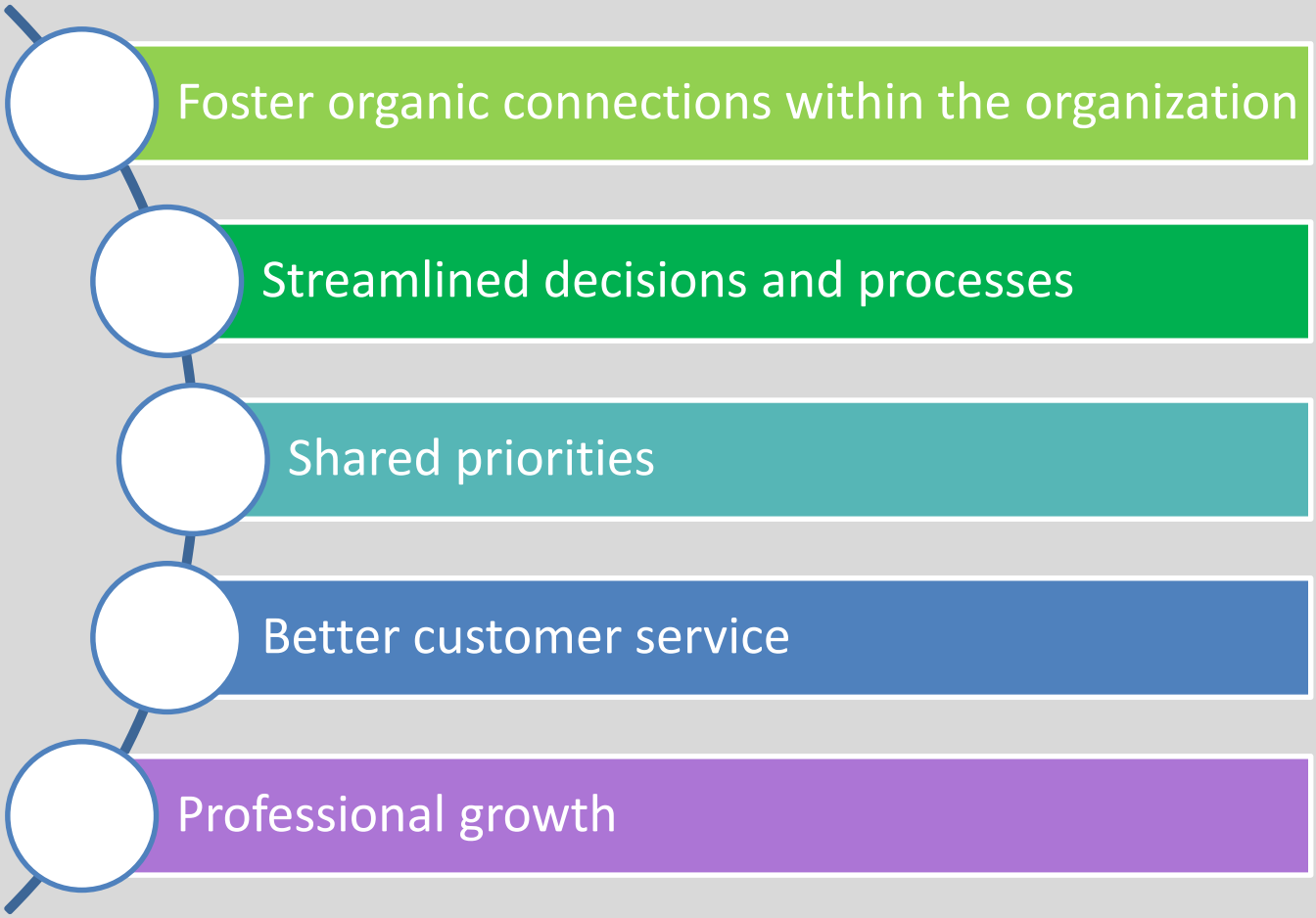
- Safety of medical devices throughout the TPLC
- Timely identification and resolution of safety issues
- Advance innovative technologies that are safer, more effective and address unmet needs



Ensure that FDA is consistently first among the world's regulatory agencies to identify and act upon safety signals related to medical devices

Published on FDA website July 19, 2018

Total Product Lifecycle (TPLC) Reorganization



CDRH Reorganization

Once fully implemented, the CDRH reorganization will:

OPEQ

Establish the Office of Product Evaluation and Quality (OPEQ) - Combines the Offices of Compliance, Office of Device Evaluation, Office of Surveillance and Biometrics and the Office of In Vitro Diagnostics and Radiological Health into one "super office" focused on a Total Product Lifecycle approach to medical device oversight.

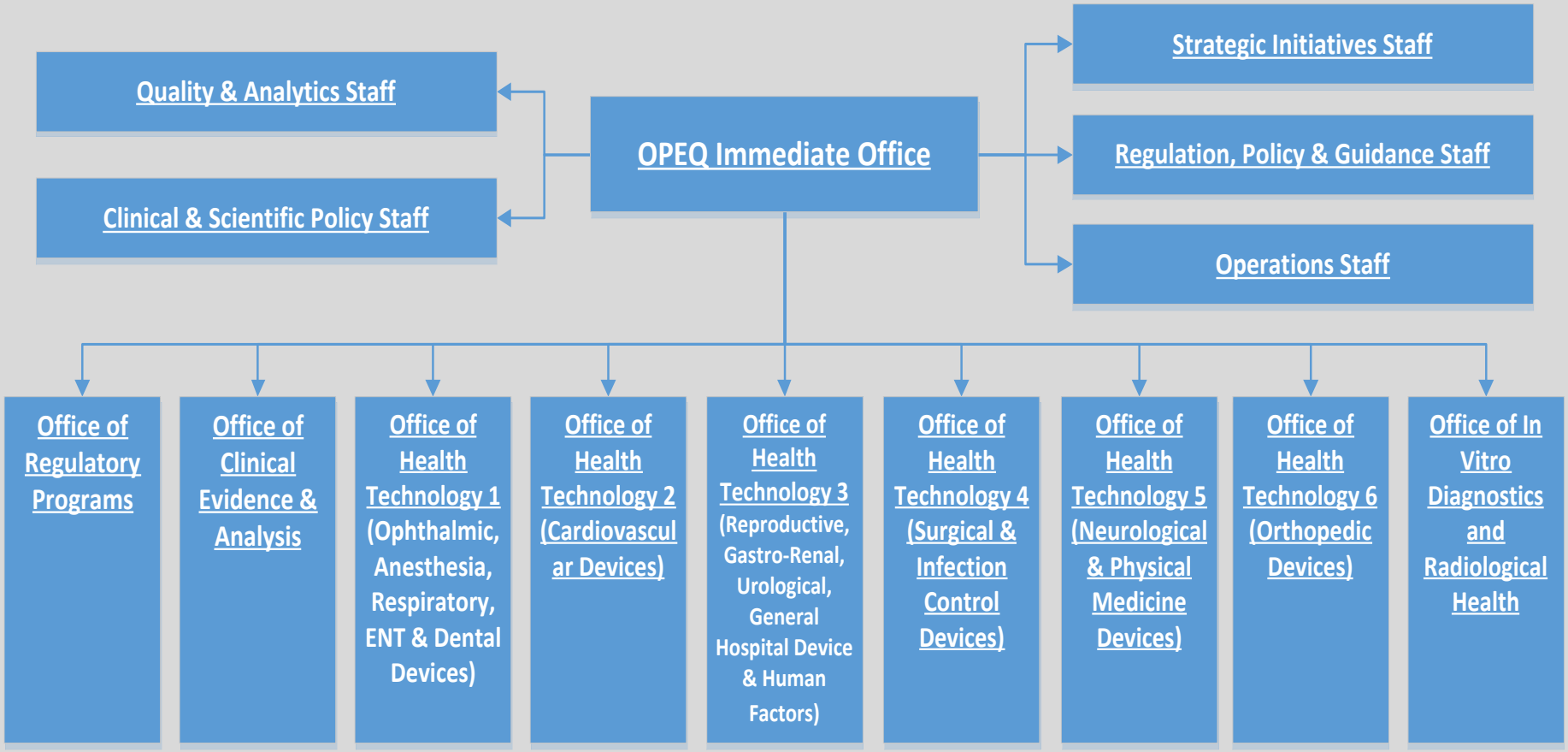
OP

Establish the Office of Policy (OP) - Establishes two teams, the Guidance, Legislation and Special Projects Team and the Regulatory Documents and Special Projects Team. There are no changes in the functions for CDRH Policy.

OST

Establish the Office of Strategic Partnerships and Technology Innovation (OST) - Combines the Science & Strategic Partnerships, Digital Health, Health Informatics and Innovation teams. There are no changes in functions within the different teams.

Office of Product Evaluation and Quality (OPEQ)



CDRH Reorganization

Date	Activity
June 11, 2018	OPEQ Pilot Began
March 18, 2019	CDRH Reorganization Officially Begins
May 1, 2019	Official OPEQ Launch
September 30, 2019	CDRH Reorganization Complete

In general, you will be interacting with the same FDA staff with whom you are familiar. If in doubt, contact the person you've always contacted.

Summary

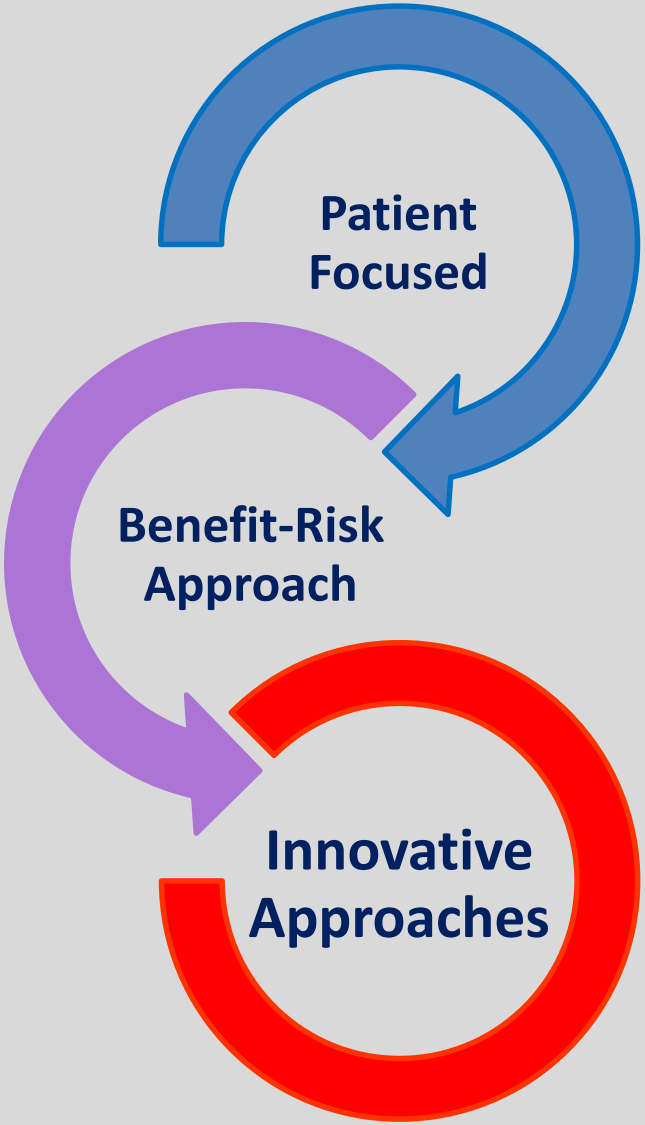
- FDA has established a number of initiatives to foster device innovation and safety
- FDA is taking a Total Product Lifecycle (TPLC) approach to medical device regulation
- CDRH is reorganizing into a TPLC framework

Questions?

Achieving Our Vision

CDRH Vision

Patients in the U.S. have access to high-quality, safe, and effective medical devices of public health importance first in the world

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