

# FDA Initiatives Responding to New Challenges

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Zvi Ladin, PhD

BOSTON | GERMANY | ISRAEL

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# FDA 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. postmarket 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.*



# CDRH Mission

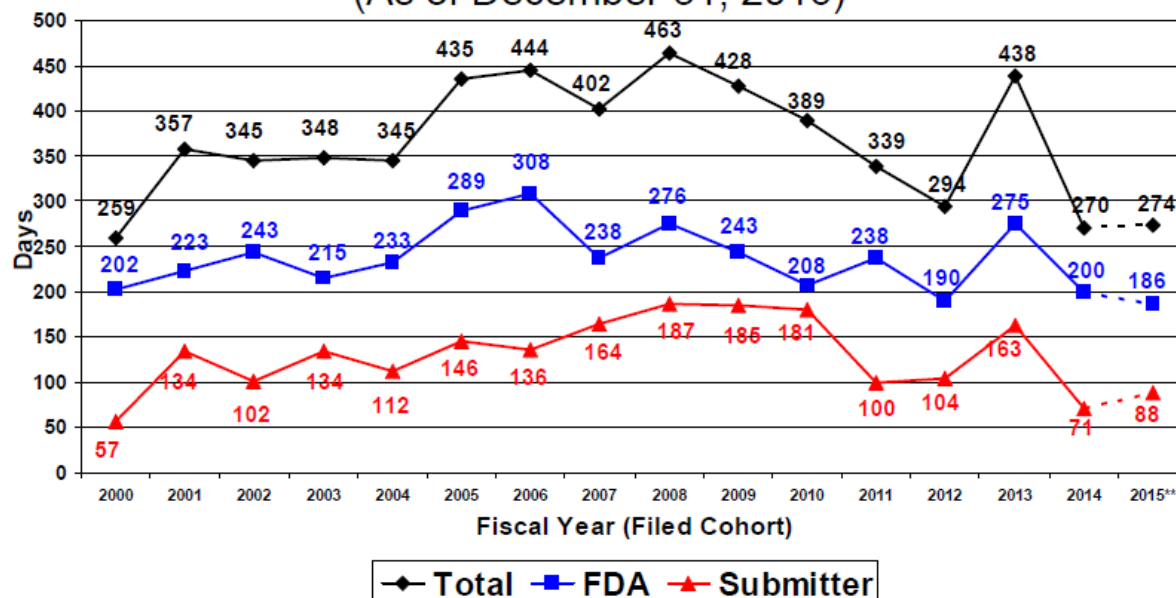
- *The mission of the Center for Devices and Radiological Health (CDRH) is to protect and promote the public health.*
- *We assure that patients and providers have timely and continued access to safe, effective, and high-quality medical devices and safe radiation emitting products.*
- *We provide consumers, 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.*

# FDA Shared Values

- **Our People**
  - Our staff is our most critical resource. We value individual excellence, teamwork, and personal and professional diversity.
- **Science-Based Decisions**
  - We make decisions based on sound science using the best available data, methods, information, and tools. We value and take into account differing internal and external perspectives.
- **Innovation**
  - We challenge the status quo and ourselves to foster positive change. We harness the creativity of our staff and stakeholders. We rapidly test and adopt new approaches to more effectively and efficiently accomplish our mission.
- **Honesty and Integrity**
  - We maintain the public trust by acting with integrity and honesty. Our actions adhere to the highest ethical standards and the law.
- **Accountability**
  - We hold ourselves accountable for the actions we do and do not take. We acknowledge our errors and learn from them.
- **Transparency**
  - We foster public trust and predictability by providing meaningful and timely information about the products we regulate and the decisions we make.

# FDA Performance – PMA including Panel

## Average Time to MDUFA Decision: PMA Originals and Panel Track Supplements\* (As of December 31, 2016)

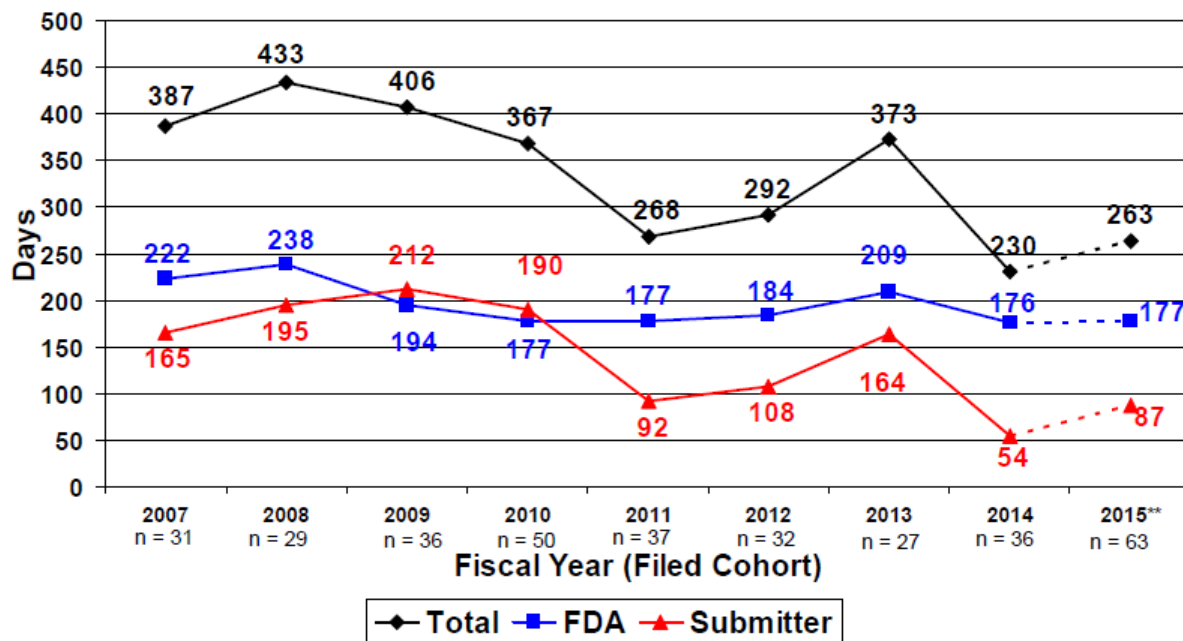


\*Includes original PMAs/PTS filed as of 12/31/2016; times may not add to total due to rounding

\*\*Cohort still open, average times will increase; percent of cohort with MDUFA decision:  
FY15 = 97% (66/68)

# FDA Performance – PMA excluding Panel

Average Time to MDUFA Decision: PMA Original & Panel Track  
Supplements Without Panel Review\*  
(As of December 31, 2016)

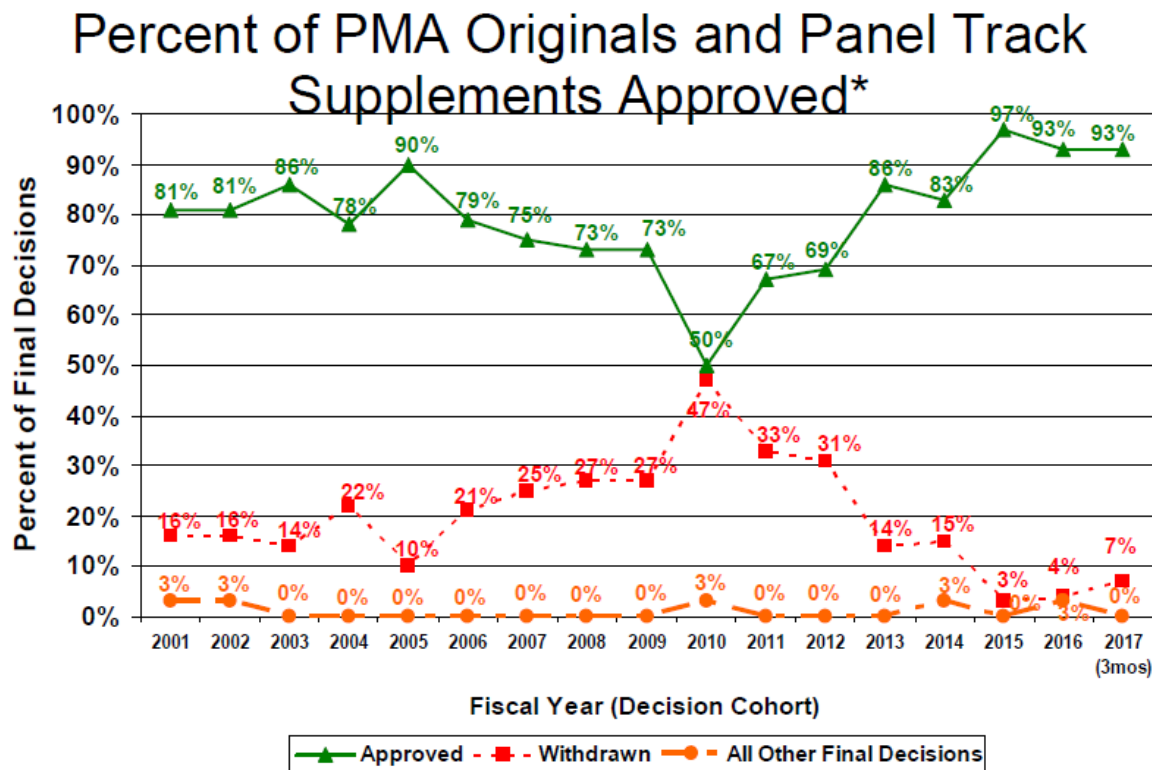


\*Includes original PMAs/PTS filed as of 12/31/2016; times may not add to total due to rounding

\*\*Cohort still open, average times will increase; percent of cohort with MDUFA decision: FY15 = 97% (61/63)

- Performance data for MDUFA III files map to Table 1.7 in the CDRH MDUFA III performance report. Numbers filed map to table 1.5.

# FDA Performance – PMA Approval Rate

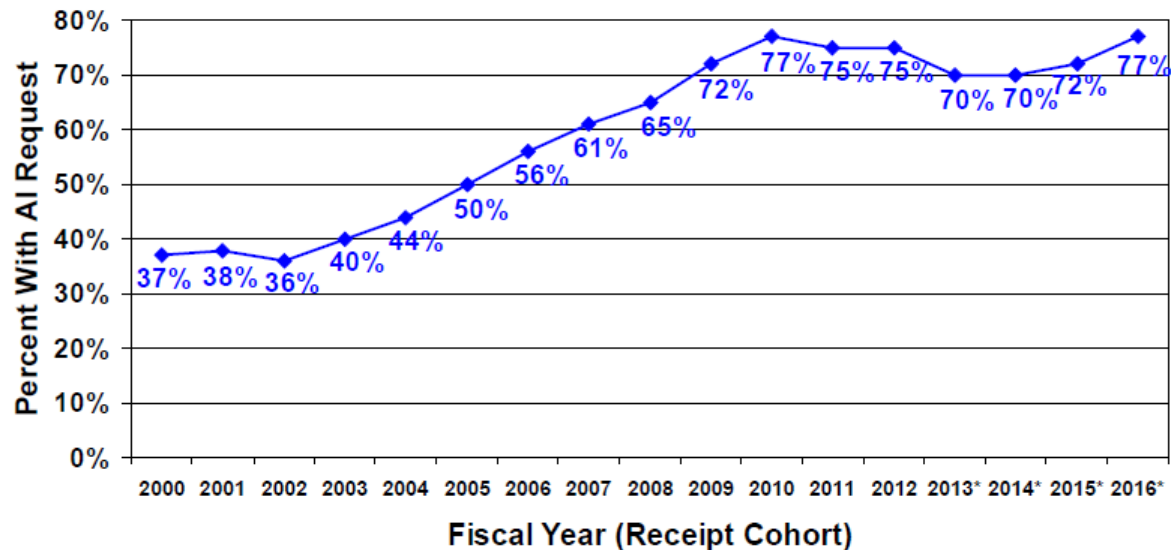


\*Based on original PMAs/PTSt that were accepted for filing as of 12/31/2016; percentages may not add to 100% due to rounding. Submissions deleted due to lack of response were considered "Withdrawn" prior to 2016, but are considered an "other" decision from 2016 onward.

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# FDA Performance – 510(k) 1<sup>st</sup> RFAI

## Percent of 510(k)s With Additional Information (AI) Request on 1<sup>st</sup> FDA Review Cycle

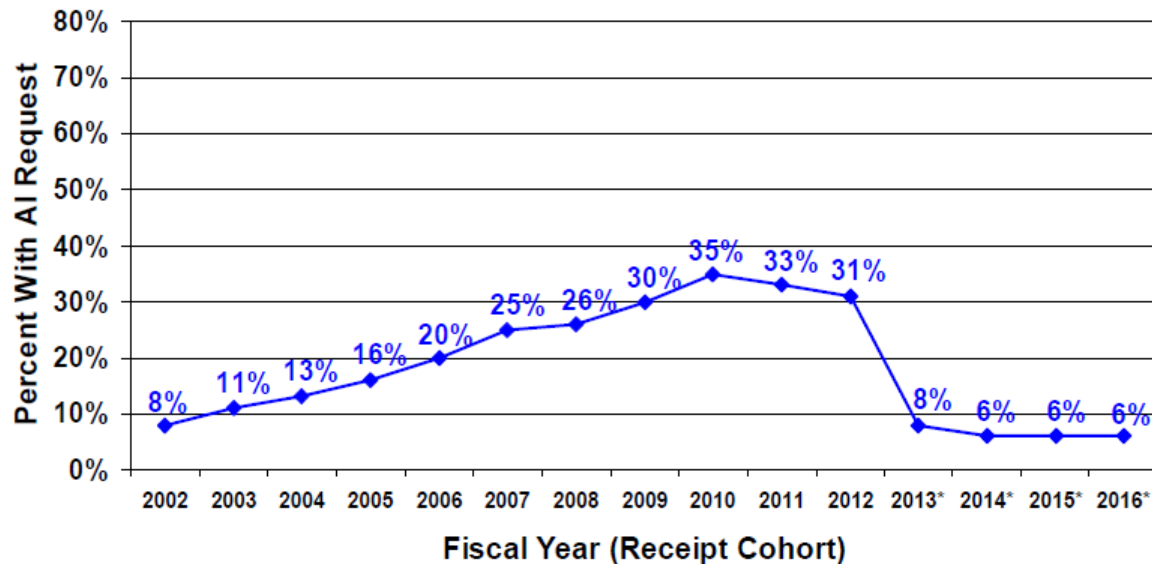


\*FY 2013 - FY 2016 data are based on the 1<sup>st</sup> substantive review cycle (i.e., excluding RTA cycles) for submissions accepted as of 9/30/2016



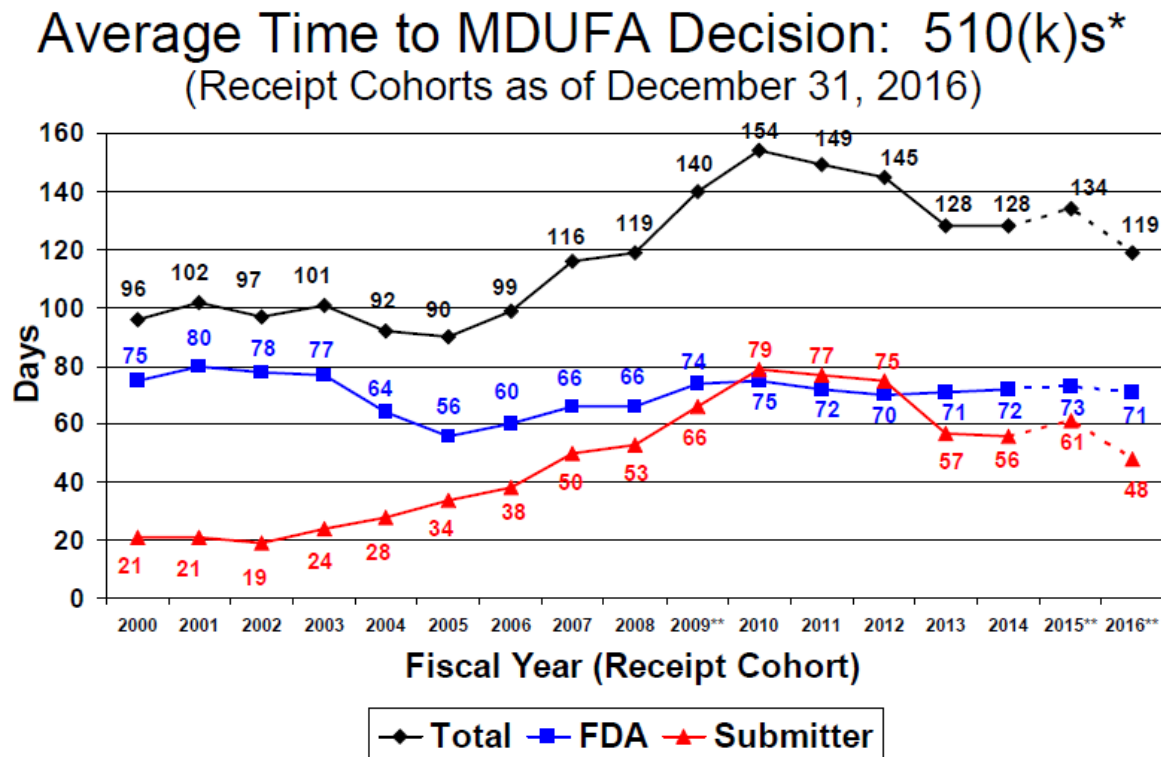
# FDA Performance – 510(k) 2<sup>nd</sup> RFAI

## Percent of 510(k)s With Additional Information (AI) Request on 2<sup>nd</sup> FDA Review Cycle



\*FY 2013 – FY 2016 data are for 510(k)s accepted as of 5/31/2016;  
FY 2015 & FY 2016 2<sup>nd</sup> cycle cohort s are still open as of 12/31/2016; data may change

# FDA Performance – 510(k) Time to Decision



\*SE and NSE decisions only; times may not add to total due to rounding

\*\*Cohorts still open; percentage of cohort closed: FY 2009 = 99.97%, FY 2015 = 99.4% and FY2016 = 75.8% => avg times for FY2015 & FY2016 will increase

- Performance data map to Table 6.5 in the CDRH MDUFA III performance report.

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## Progress in Meeting Past Strategic Priorities (2014-5)

- Clinical Trial Enterprise
- Retrospective review of all 210 high-risk device Product Codes
  - Conducted 275 post-market analyses
  - Down-classification of 30% or product codes
- Regulatory pathway for breakthrough devices
  - Shifting premarket requirements to post-market settings where possible
- Provide excellent customer service
- Completed 14 pre-market process improvement projects

# Improvements of Internal Processes

- Implementation of 11 recommendations of MDUFA III assessment of premarket review process
  - Revised eCopy and Refuse to Accept (RTA) policies
  - Internal process improvements
    - Premarket review file management
    - Kirkpatrick methodology for training evaluation
    - Plan for [incorporating quality management](#) into premarket review activities
    - Review tools to promote [consistency](#) of reviews
    - Establishment of FDDBACK√CDRH – suggestions for improvement and quality issues

# Focus Areas for 2016-2017

- Establish a **National Medical Devices Evaluation System (NMDES)**
  - Infrastructure to support comprehensive medical device use data
  - Generate robust real-world data in an efficient manner
  - Early identification of new safety problems (on-market devices)
  - Use field (post-market) data to **support product approvals**
  - Incentivize innovators to introduce products **first** to US Market
- **Partner with patients** – evolving role of patients
  - Patient-centric clinical trials
  - Develop patient-friendly information
  - Benefit-risk assessments informed by patient perspectives
  - Promote patient-reported outcome data
  - Foster access to new devices to meet patients' needs
  - From passive recipients to healthcare advocates
  - From consumers of information to
- **Promote culture of quality and organizational excellence**
  - Provide necessary oversight to **provide US patients time access to life-enhancing innovative medical devices** while assuring devices are high-quality, safe and effective

# Obstacles to Introduction of New Technologies into US Market

- Disincentives for innovators to study (and later introduce) new technologies into US market
  - High costs and inefficiencies of data generation in clinical trials
    - Limit conduct of pioneering studies in US
  - Passive (and limited) reporting of post-market surveillance data
    - Limit generation of safety data for regulatory monitoring
- Strike right balance between pre/post market data
  - NMDES – bridge information gap pre/post market data

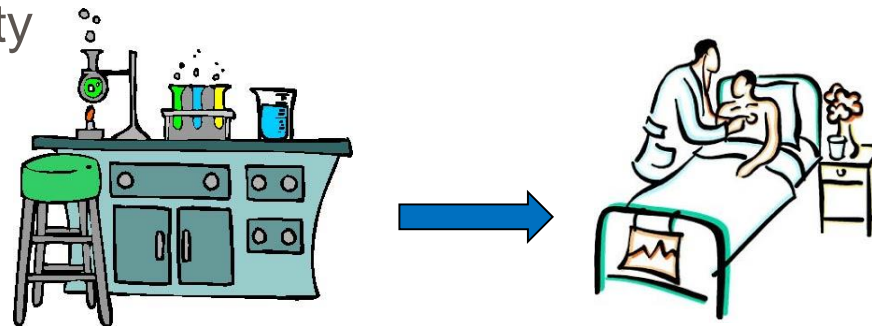
# Goal – Combine Clinical Research and Patient Care

## Clinical Research

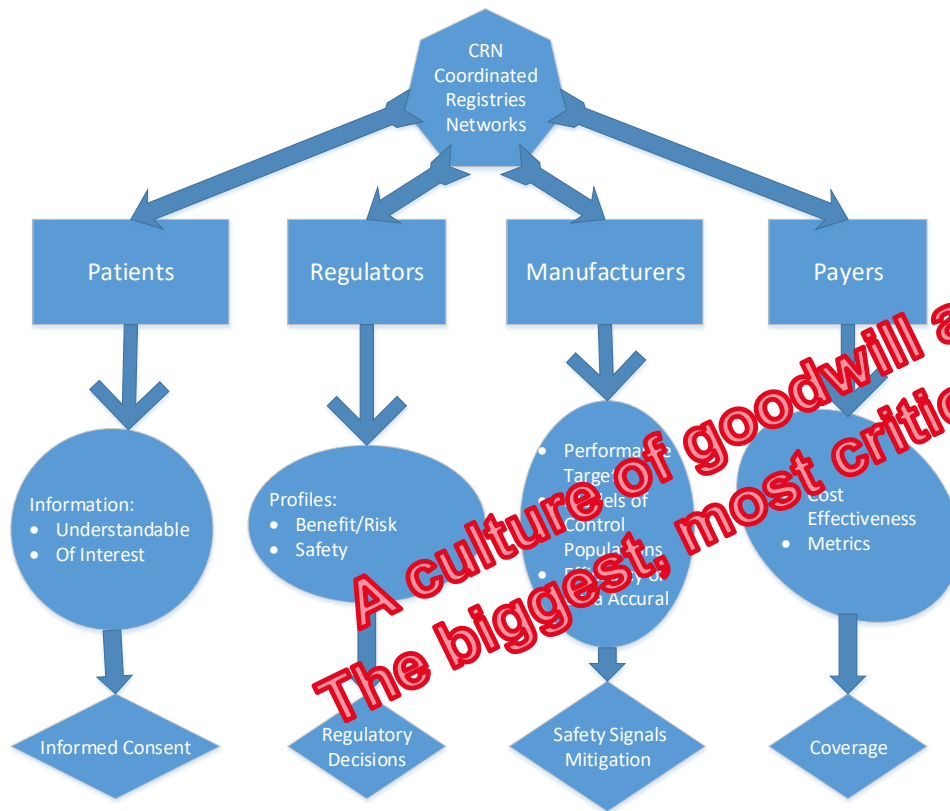
- **Limited** size
- **Select** sites
- **Reductionist** inclusion/exclusion
- **Detailed** information gathered
- **Limited** generalizability

## ‘Real World’ Patient Care

- **Large** number of patients
- **Various** care venues
- **Expansionist** inclusion/exclusion
- **Limited** information gathered
- **Generalizable**



# New Paradigm for PMS\* – National Device Evaluation System

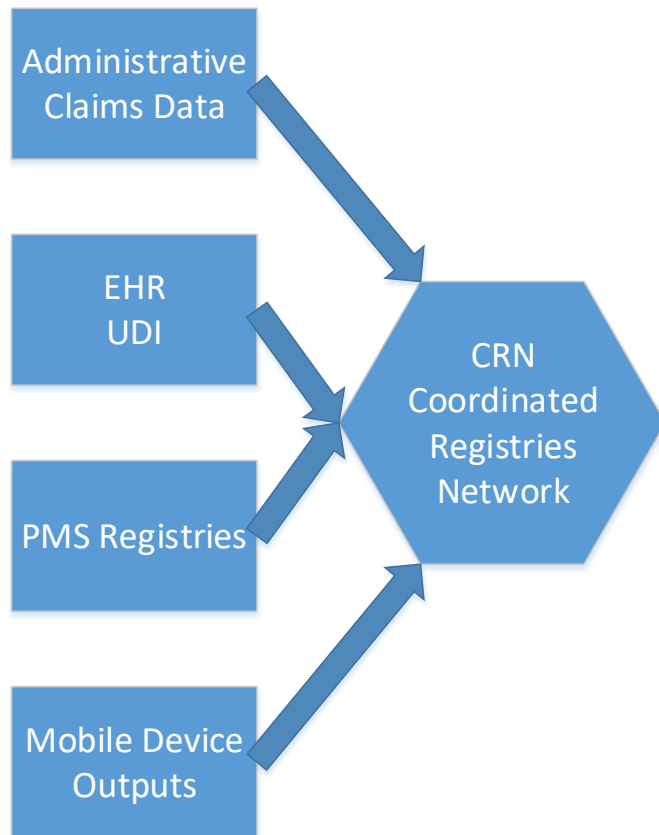


- Coordinated Registry Networks (CRN)
- Four Stakeholders
- Different
  - Interests
  - Information
  - Goals
  - Uses
- 'Same' information

\* PMS – Post-Marketing Surveillance



# NMDES – Sources of Information

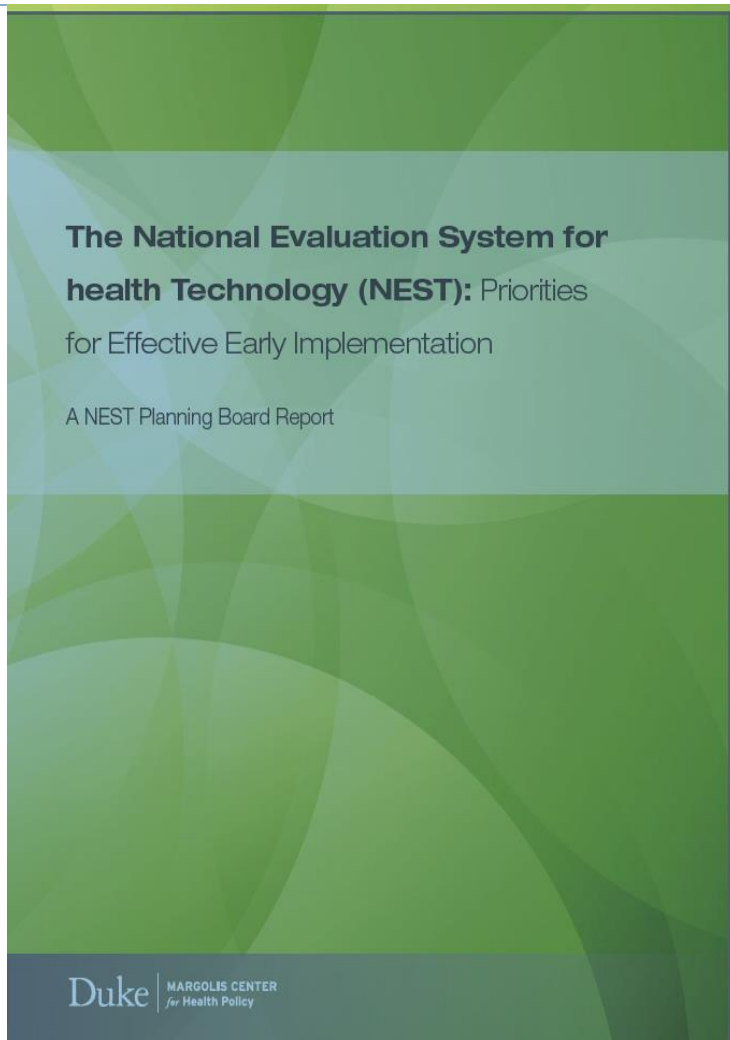


- National Medical Device Evaluation System
  - Multiple sources of information available
    - **EHR** – Electronic Health Record
    - **UDI** – Unique Device Identifier
    - PMS (Post-Marketing Surveillance) **Registries**
    - **Claims** data (payers/administrative)

# Principles for Establishing CRN Functionality

- Device identification
- Use of standardized
  - Clinical vocabulary
  - Common data elements
  - Outcome definitions
- Generalizable interoperability solutions
  - Linking disparate data sources
- Creating partnered, inclusive governance
- Develop value-based incentivized sustainability
- Target – Incubator Project
  - Serious consequences of device failures
  - Expected rapid uptake
  - Long-term safety and effectiveness not understood
  - Design variations
  - Variable performance
  - Procedure – Operator dependent
  - Higher costs
  - Best practice – unknown
  - Problems with similar devices
  - Challenges in collecting outcome

# National Evaluation System for Health Technology (NEST)



- Third Planning Board Report (9/2016)
- Establish Coordinating Center
  - Building voluntary network of data partners
  - Network of methodological expertise
  - Establish effective multi-directional communication platform
- Use demonstration projects to develop resources
  - Phase I – Feasibility (3-yr)
    - Balancing pre- post-marketing
    - Active surveillance system
  - Phase II – 5-yr
    - Integrate health IT (Class II devices)
    - Patient-mediated data sharing
    - Measure device value

# Specific Goals

- Increase access to 'real-world' evidence to support regulatory decision making
  - By December 31, 2016
    - Access to 25 million patient records from
      - National and international clinical registries
      - Claims data
      - Electronic Health Records (EHRs)
      - Device identification
    - Increase by 40% number of pre- and post-market regulatory decision that leverage 'real-world' evidence (compared to 2015 baseline)
  - By December 31, 2017
    - Access to 100 million patient records
    - Increase by 100% number of pre- and post-market regulatory decision that leverage 'real-world' evidence (compared to 2015 baseline)

# CDRH Steps Implementing NMDES Goals

- Establish organizational structure and development of infrastructure for the National Evaluation System (NMDES)
- Develop framework for incorporation of real-world evidence into regulatory decision making
- Develop 'real-world' evidence education and training for CDRH staff and industry
- Develop metrics to track progress on building NMDES

# Partner with Patients

- *We believe that if CDRH is to successfully achieve a mission and vision in the service of patients, we must **interact with patients as partners** and work together to advance the **development and evaluation of innovative devices**, and **monitor the performance of marketed devices***
- Shifting role of patients
  - From passive consumers to active partners and decision-makers
  - Families/caregivers representing special populations (e.g. children)
  - Patient groups – from patient support, advocacy and research funding organizations to active partners in medical product development and assessment
  - Patient-centric medical product innovation, assessment and regulatory decision-making
    - Patient-Centered Outcome Research Institute (PCORI)
    - White House Precision Medicine Initiative

# THE PRECISION MEDICINE INITIATIVE



- *“Doctors have always recognized that every patient is unique, and doctors have always tried to tailor their treatments as best they can to individuals. You can match a blood transfusion to a blood type — that was an important discovery. What if matching a cancer cure to our genetic code was just as easy, just as standard? What if figuring out the right dose of medicine was as simple as taking our temperature?”*  
- President Obama, January 30, 2015
- What is the Precision Medicine Initiative?
- **Mission statement:**
- *To enable a new era of medicine through research, technology, and policies that empower patients, researchers, and providers to work together toward development of individualized care.*
- The future of precision medicine will enable health care providers to tailor treatment and prevention strategies to people’s unique characteristics, including their genome sequence, microbiome composition, health history, lifestyle, and diet. To get there, we need to incorporate many different types of data, from metabolomics (the chemicals in the body at a certain point in time), the microbiome (the collection of microorganisms in or on the body), and data about the patient collected by health care providers and the patients themselves. Success will require that health data is portable, that it can be easily shared between providers, researchers, and most importantly, patients and research participants.
- Agencies across the Federal government are doing important work to support the President’s vision. This is an “all of government” effort, leveraging the unique expertise and history of each agency to carry forward the President’s vision of individualized treatments for every American. Here’s how each participating agency is moving ahead to implement PMI:

# Implementing Patient = Partner

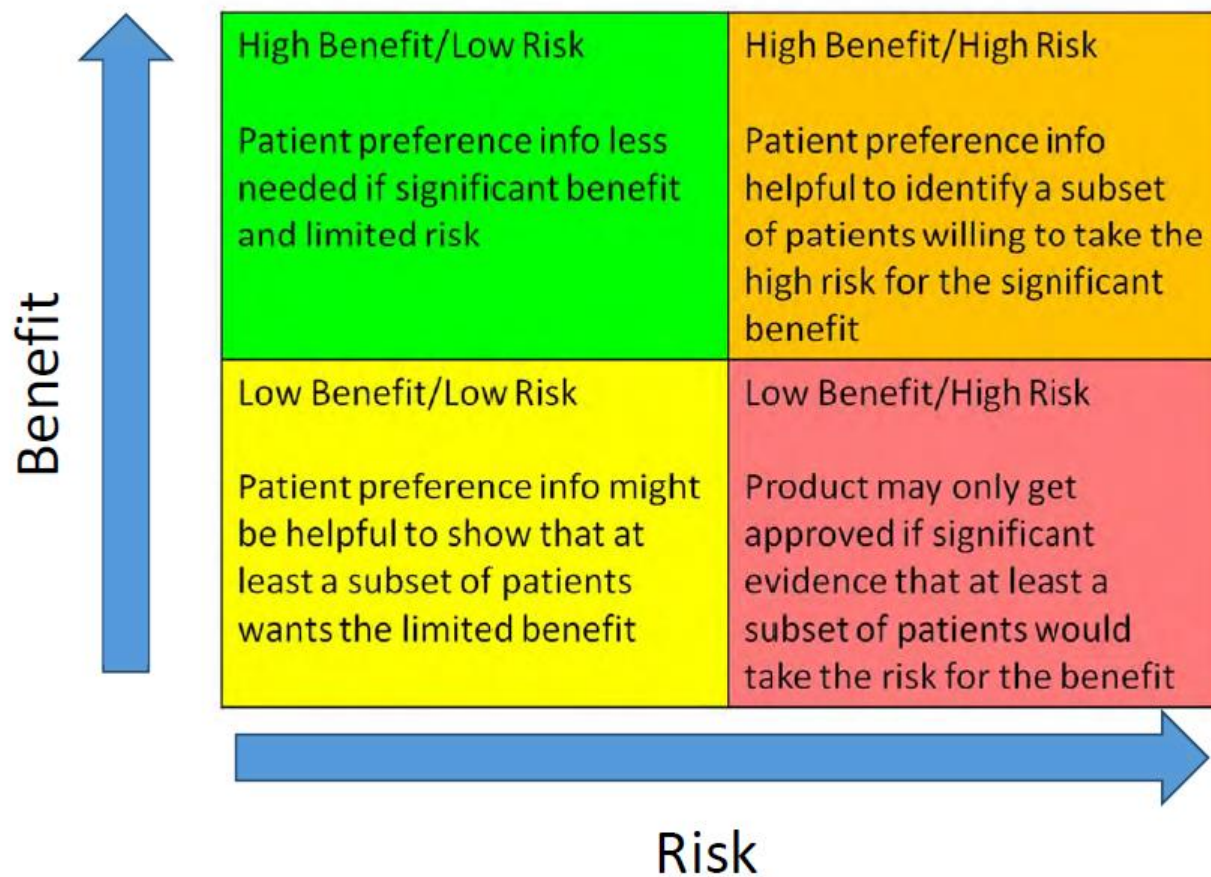
- Patient data donation movement
  - Participant engagement – focus of White House (Obama) Precision Medicine Initiative
- Increased role of patient evidence
  - Established service on CDRH Advisory Committees
  - Better understand patient needs and seek their input
  - Patient input as evidence
  - Increase in number of patient-reported outcome (PRO)
    - Primary and secondary endpoints in clinical studies
    - 2009 – 20 studies
    - 2014 – 120 studies



# Patient Preferences – New Key Element

- 2012 Benefit-Risk Framework for PMA Approvals and *de novo* Classifications
  - Patient perspectives on benefits and tolerance for risks – important factor in premarket approval decisions
  - Launched Patient Preference Initiative
    - Advance development and use of robust scientific methods to assess benefit-risk tradeoffs patients are willing to make
    - Rely on the information in decision-making
- Example
  - CDRH sponsored *Patient Preference Study in Obese Patients*
  - Approve first device treatment for obesity since 2007
  - Issued *Patient Preference Draft Guidance*
  - Participated in **Medical Device Innovation Consortium (MDIC)**
    - Developed *Patient-Centered Benefit-Risk Framework and Catalog Assessment Methods*

# Patient-Centered Benefit Risk



# Working **with** Patients ≠ **on** Patients' **Behalf**

- Develop more patient-friendly information
  - Safe and effective device use
- Promote more patient-centric clinical trials
  - Measure what is most important to patients
  - Designed to facilitate patient participation
- Advance benefit-risk assessments informed by patient perspectives
- Foster earlier access to beneficial new devices that meet patients' needs

# Specific Goals

- **MEANINGFUL PATIENT ENGAGEMENT**
  - Establish one or more new mechanisms for CDRH employees to obtain patient input on key pre- and post-market issues facing CDRH from patient-groups
    - 10 by 12/31/2016 | 20 by 12/31/2017
  - CDRH employees will interact with patients as part of their job duties
    - 50% by 12/31/2016 | 90% of by 12/31/2017
- **PATIENT INPUT AS EVIDENCE IN DECISION MAKING**
  - Summaries of **Available** and **Relevant Patient Perspective Data** Considered in PMA, *de novo* and HDE Decisions
    - 50% by 9/30/2016 | 100% by 9/30/2017
  - **Increase number** of patient perspective studies used in support of premarket and postmarket regulatory decisions
    - By 9/30/2017 (compared to FY 2015 baseline)
  - **Increase number** of Expedited Access Pathway data development plans or regulatory submissions that consider patient perspectives
    - By 9/30/2017 (Compared to FY 2015 baseline)

# Implementation Plan

- Establish patient-focused program responsible for strategic development and coordination of CDRH's initiatives to advance patient engagement and the science of patient input throughout total product lifecycle
- Convene [Patient Engagement Advisory Committee](#) to discuss high priority topics regarding patient input in the total product lifecycle.
- Identify/define various pre- and post-market regulatory uses of patient reported outcome measures (PROMs) and issue report summarizing [current PROM regulatory usage patterns and gaps](#)
- Work with members of medical device ecosystem to develop framework for patient input to inform clinical study design and conduct, with goal of reducing barriers to patient participation and facilitating recruitment and retention
- Develop education and training for CDRH staff and industry on development and use of the science of measuring and communicating patient input throughout the total product lifecycle

# Culture of Quality and Organizational Excellence

- **Case for Quality** (2011/Office of Regulatory Affairs)
  - Initiative with other members of device ecosystem
  - Identify practices that can promote a culture of quality
  - Implement QM approach that fosters continuous product quality
  - Focus on manufacturing practices of greatest impact on product quality and patient safety
  - Shift regulatory approach to preventive model
    - Adapt to changes in science and technology
    - Rapidly address events that impact safety
- **Quality Management Framework** (2013)
  - Individual commitments to quality are evident
  - Consistently take quality-focused actions
  - Quality is always part of the conversation

# Implementation Milestones

- **STRENGTHEN FDA'S CULTURE OF QUALITY**
  - Increase number of CDRH staff with quality and process improvement credentials
    - 10% by 9/30/2016 (compared to FY 2015 baseline)
    - 25% by 9/30/2017 (compared to FY 2015 baseline)
- Eligible for ISO 9001 certification (by 9/30/2017)
- Submit a formal application to assess progress towards adopting the Baldrige Performance Excellence Criteria and achieving organizational excellence (by 12/31/2017)
- **STRENGTHEN PRODUCT AND MANUFACTURING QUALITY WITHIN MEDICAL DEVICE ECOSYSTEM**
  - Develop [metrics](#), successful industry practices, standards, and tools that [manufacturers can use](#) to evaluate product and manufacturing quality beyond compliance with regulatory requirements (by 9/30/2016)
  - Pilot voluntary use of product and manufacturing quality metrics and evaluation tools (by 12/31/2016)
  - Propose a voluntary program to recognize independent evaluation of product and manufacturing quality (by 12/31/2017)

# Thank You!

Contact information:

Boston MedTech Advisors, Inc.  
990 Washington Street  
Dedham, MA 02026  
Ph. 781.407.0900  
[zladin@bmtadvisors.com](mailto:zladin@bmtadvisors.com)

