



# Regulation of Pharmaceutical Quality in the US

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Food and Drug Administration



# Learning Objectives

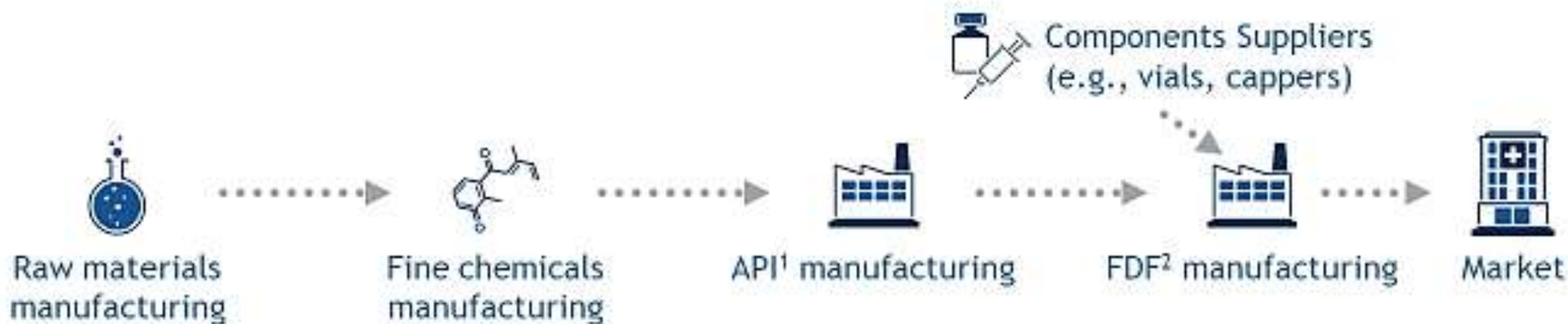
- Define Pharmaceutical Quality and its importance to patients
- Describe how FDA regulates pharmaceutical quality and the roles and responsibilities of Office of Pharmaceutical Quality

A close-up photograph of a person's hands. The left hand holds an orange plastic pill bottle, tilted to pour white, oval-shaped capsules into the palm of the right hand. The background is blurred, focusing attention on the action of dispensing the medication.

**Pharmaceutical quality is**  
consistently meeting standards  
that ensure every dose is safe  
and effective, free of  
contamination and defects.

# Pharmaceutical Quality is also linked to Drug Availability

- 2019 Drug Shortage Report
- Supply Chain Issues highlighted by the COVID-19 Crisis



# A History of Events Affecting Quality



## 1938

>100 deaths from elixir sulfanilamide

1938 Food, Drug, and Cosmetic (FD&C) Act

**Safety studies required for new drugs**

## 1962

Children born with severe birth defects from thalidomide

1962 Kefauver-Harris Amendments to the FD&C Act

**Need to prove that drugs are safe and effective**

## 2015

>100 deaths from global heparin crisis in 2008  
> 50% of shortages are due to quality issues

**CDER establishes Office of Pharmaceutical Quality (OPQ) which integrates functions and elevates commitment to quality**

## 2020+

COVID-19 outbreak highlighted need for new drugs, repurposing existing drugs, supply pressures on essential medicines

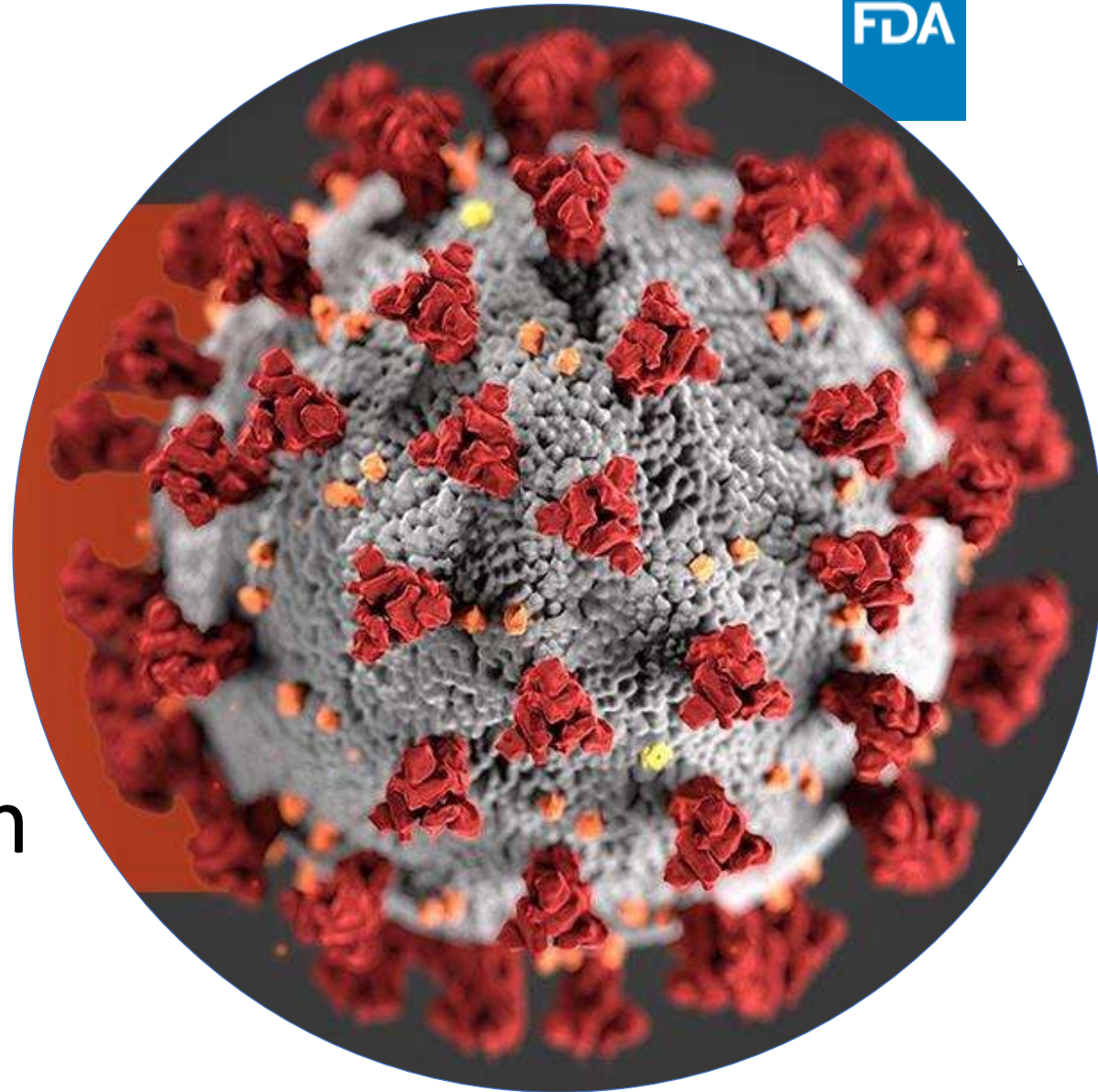
**Supply chain, Alternative tools for site evaluations, rapid approvals and authorizations for site changes, increased international collaborations**

# The Era of COVID-19

FDA

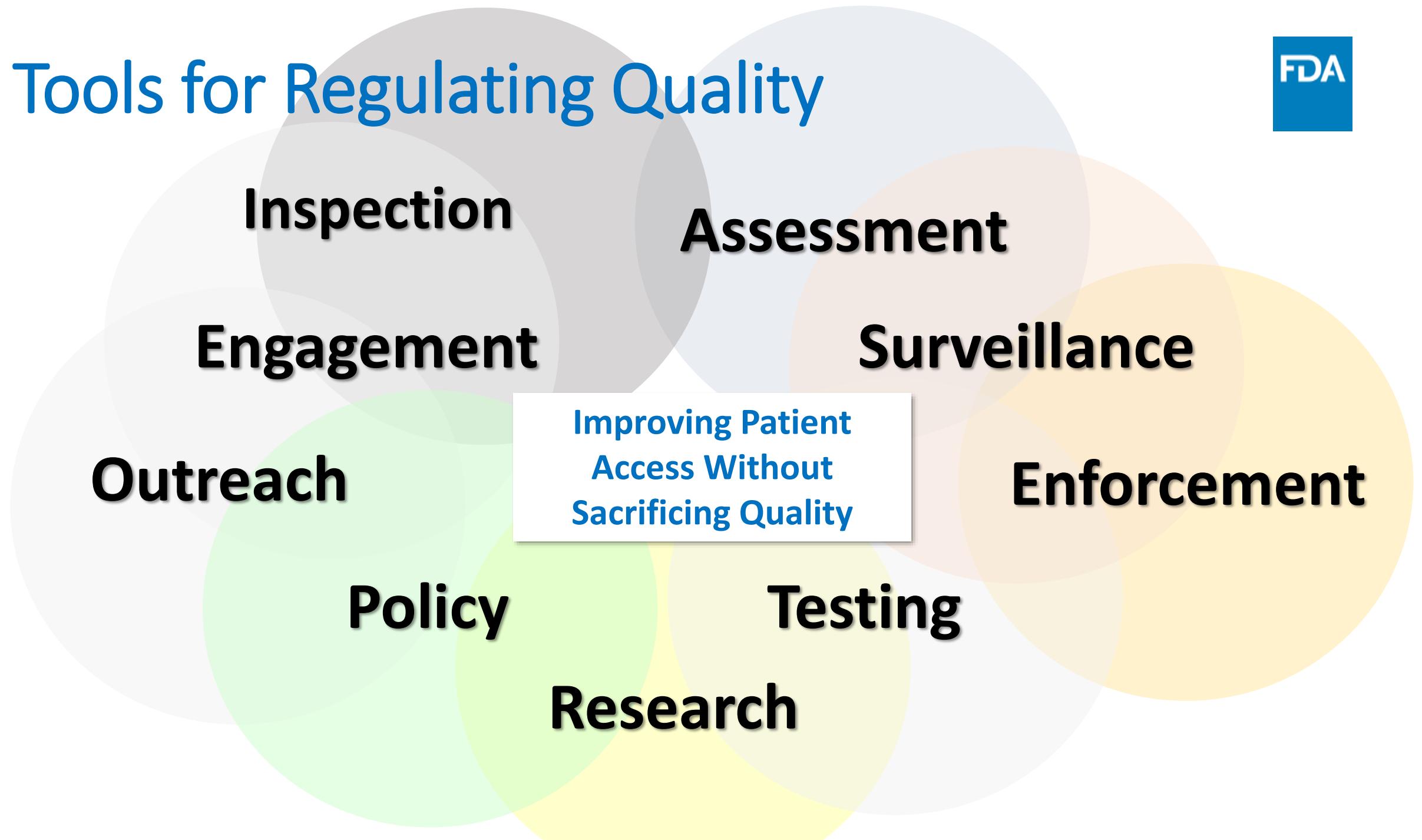
**Long-existing quality issues are now magnified**

- Supply chains
- Shortages
- Decision-making based on changing science and risk

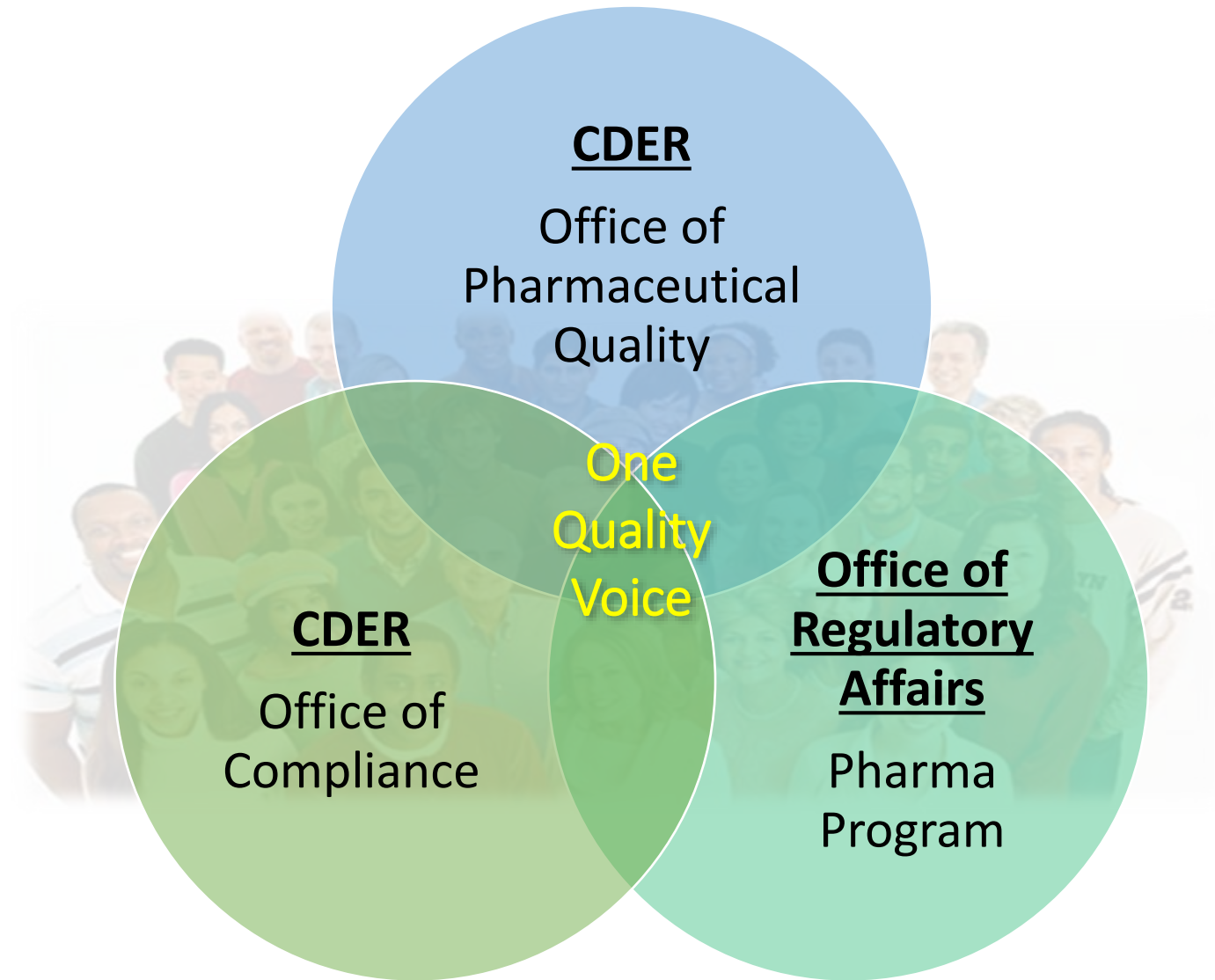




# Tools for Regulating Quality



# One Quality Voice





# OPQ

## Immediate Office

**Michael Kopcha**  
Office Director

## Adam Fisher

Acting Assoc. Director for Communications

## Cindy Buhse

Deputy Super Office Director of Operations

## Sau Larry Lee

Deputy Super Office Director of Science

## Office of Administrative Operations (OAO)

Candee Chadwick

## Office of Program and Regulatory Operations (OPRO)

Don Henry

## Office of Policy for Pharmaceutical Quality (OPPQ)

Ashley Boam

## Office of Biotechnology Products (OBP)

Steven Kozlowski

## Office of New Drug Products (ONDP)

Lawrence Yu

## Office of Lifecycle Drug Products (OLDP)

Susan Rosencrance

## Office of Pharmaceutical Manufacturing Assessment(OPMA)

Stellios Tsinontides

## Office of Quality Surveillance (OQS)

Jennifer Maguire

## Office of Testing and Research (OTR)

David Keire



# Quality Over the Drug Product Lifecycle

- **OPQ focuses on the entire drug product life**
- **We emphasize knowledge sharing across life stages**
  - Assures quality medicines are consistently available to the American public
  - Proactively works to prevent drug shortages
  - Ensures parity between brand and generic products



IND → NDA

Post-Marketing  
NDA

ANDA

Post-Marketing



# OPQ: By the Numbers



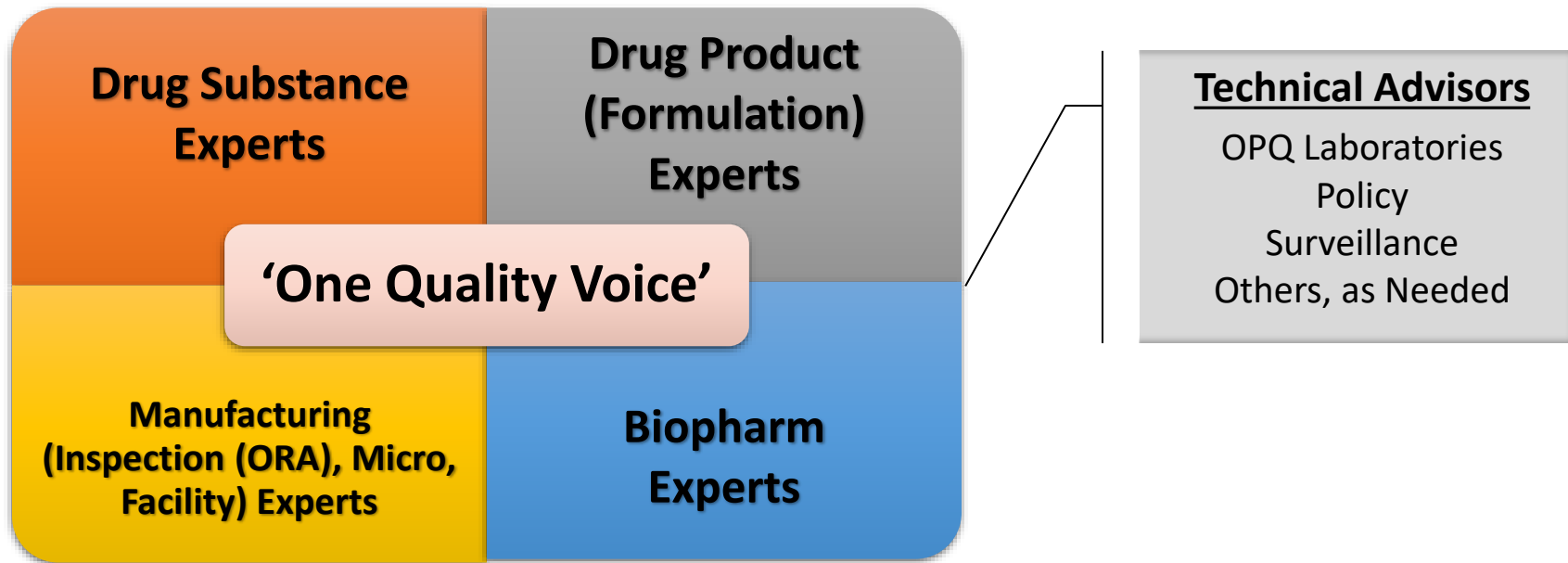
**Around 1,300  
staff in OPQ**

- **Quality Assessments of submissions in a year:**
  - Around **20** biologics including biosimilars
  - Around **200** new drugs
  - Around **3,000** investigational new drugs
  - Around **4,000** generics
  - Around **7,000** supplements
- **Surveillance of ~6,000 facilities including non application products**
- **>100 Publications and >200 Technical Reports per year**
- **Numerous policy documents for internal and external use**

# Team-based Integrated Quality Assessment (IQA)



## Discipline Reviewers



**Application Technical Lead (ATL)** – oversees the scientific content of the assessment

**Regulatory Business Process Manager (RBPM)** – manages the process, keeps team on track to meet established timelines, and communicates with sponsors

# Human Drug Inventory by Approximate Numbers



## Sites:

- ~7,950 human drug manufacturing sites of obligation (as defined by regulations and policy)
  - ~1,840 Medical Gas (MG) manufacturers (nearly all in U.S.)
  - ~6,110 Non-MG manufacturers
    - 46% domestic
    - 54% foreign

## Products:

- 32,439 unique Products
  - Defined as combination of active Ingredient, dosage form and route of administration
- 21,767 unique Active Pharmaceutical Ingredients
- 58 unique medical gas by proprietary name



**Note:** Based on August 2021 Surveillance Catalogs and current eDRLS listings.

# Sources of Information for Quality Surveillance



## Facility and Inspection Data

- Registration and Listing
- Inspection findings
- Profile Class Codes, Imports, Business operations, etc.

## Quality Defect Reports

- Field Alert Reports (FARs)
- Biological Product Deviation Reports (BPDRs)
- MedWatch Reports
- Recalls (Type I, II, III)
- Consumer Complaints
- Informants

## Drug Quality Sampling and Testing Results

### Application data

- Original and Supplements
- Annual Reports

### External data

- Foreign regulatory authority information
- Public information – social media, consumer reviews (e.g., drugs.com), blogs, news outlets, etc.



## Future

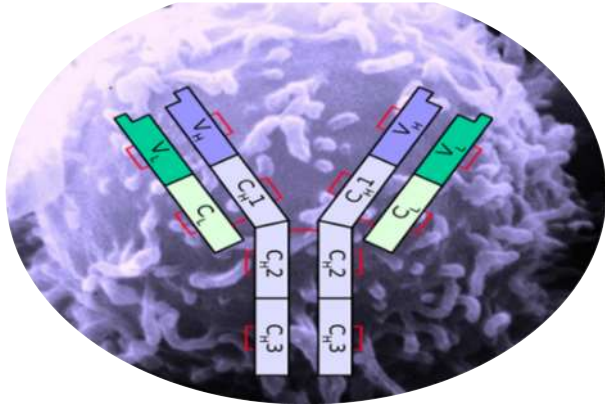
Quality Metrics

Quality Management Maturity



# OPQ Science and Research

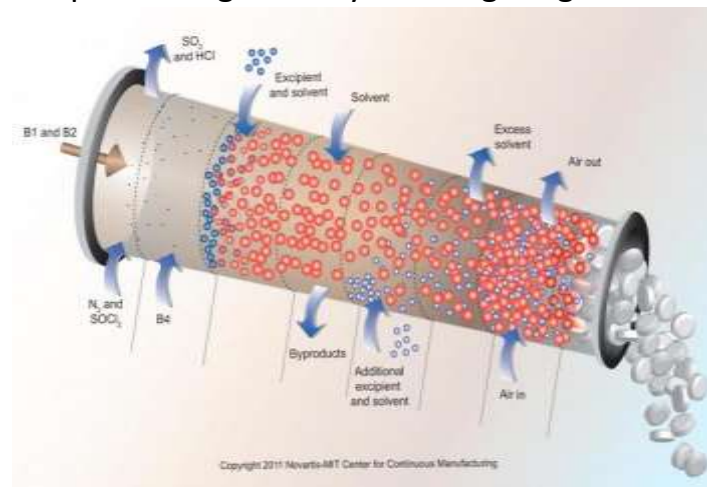
## Immunology



## Manufacturing Science & Innovation

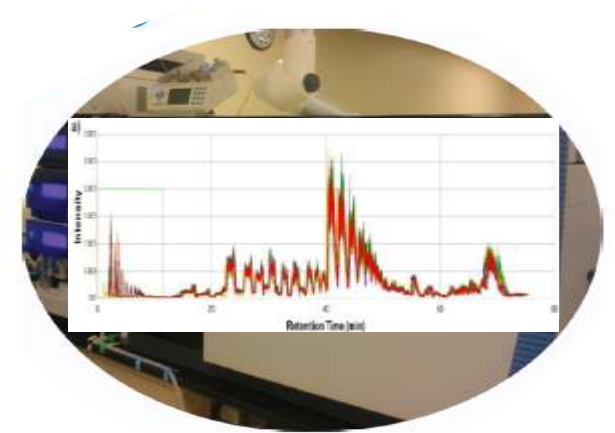
Novel **manufacturing methods** to improve process robustness and efficiency

Novel **dosage forms** or delivery systems to improve drug delivery and targeting

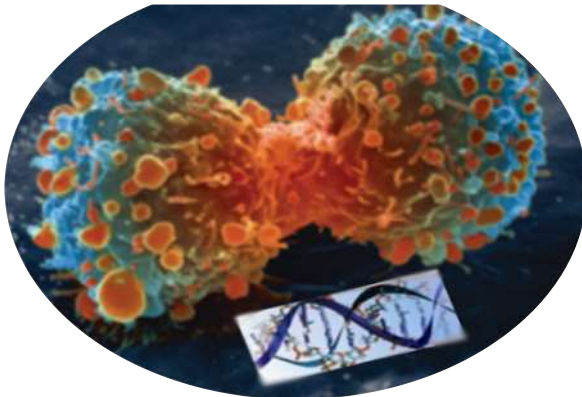


## Pharmaceutical Analysis & Characterization

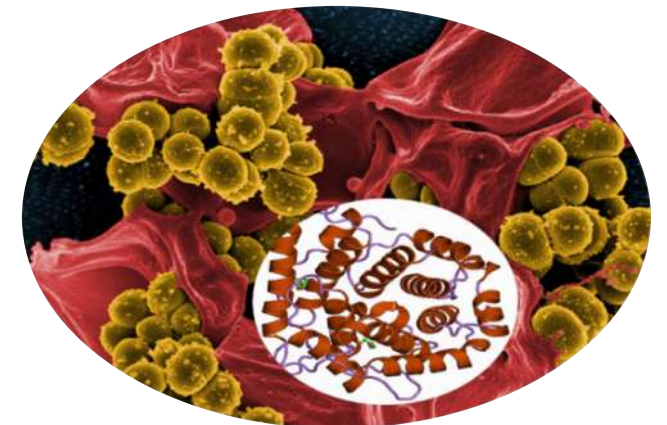
Novel **analytical tools** to improve product quality testing, process monitoring and/or control



## Tumor Biology



## Infectious Disease & Inflammation





# The Future: Assuring Quality

- **Advanced Manufacturing Research and Regulatory Framework**
- **Pharmaceutical Supply Chain Understanding**
- **Quality Management Maturity Program**
- **Promote Regulatory Convergence**
- **Foster Global Partnerships**



## Challenge Question #1

**What percent of non medical gas pharmaceutical facilities are located in the US?**

- A. 10%
- B. 20%
- C. 46%
- D. 80%



## Challenge Question #2

### **Which of the following statements is true?**

- A. OPQ is responsible for clinical review of new drugs.
- B. OPQ regulates pharmaceutical quality only for generic drugs.
- C. OPQ regulates pharmaceutical quality only for small molecules (new drugs and generics).
- D. OPQ regulates pharmaceutical quality for small molecules (new drug and generics), biologics, and non application products (including some over-the counter and homeopathic products).



# One Quality Voice for Patients

Four overlapping posters for the 'One Quality Voice for Patients' campaign. Each poster features a photograph of a patient or caregiver, a quote from a patient or reviewer, and the FDA logo. The posters are arranged in a row, with each subsequent poster slightly offset to the right and forward.

**Poster 1 (Leftmost):** Features a woman smiling while a young boy kisses her on the cheek. Text: "OPQ **Collaborates** so that Quality Medicines are Available to Patients. **Innovates**, **Communicates**, **Engages**". Quote: "In 2013, I was hospitalized with H1N1 along with 6 other patients. I was the only one who survived. I am more than a statistic, I am a mother!" - OPQ Reviewer.

**Poster 2:** Features a young boy in a blue inflatable ring in the water, seen from behind an older woman. Text: "Collaborates", "OPQ **Innovates** so that Better Medicines are Available to Patients", "Communicates", "Engages". Quote: "My grandson was born prematurely. Thanks to the lung surfactant he received, that my colleague worked so hard on, he has grown into a healthy little boy." - ONDP Reviewer.

**Poster 3:** Features a person with arms raised in a field at sunset. Text: "Collaborates", "Innovates", "OPQ **Communicates** to Patients that they can Trust the Next Dose of Medicine", "Engages". Quote: "My friend whose medical struggles and early death definitely factored into my decision to join the FDA in 1993" - ONDP Scientist.

**Poster 4 (Rightmost):** Features a woman holding a young boy's hand while looking at a device. Text: "Collaborates", "Innovates", "Communicates", "OPQ **Engages** asking YOU to Join us in a Commitment to Quality in the Name of the Patient". Quote: "My eldest son was diagnosed with insulin dependent diabetes in 1982, and developed an injection site reaction to pork insulin, he was a subject in phase III clinical trial for Humulin" - ONDP Scientist.

All posters include the text "One Quality Voice for Patients. *We are Patients, Too.*" and the website "www.fda.gov".

## We Are Patients, Too.