

# Barriers to Innovation: A Quality Perspective

**Michael Kopcha, Ph.D., R.Ph.**

Director

Office of Pharmaceutical Quality

Center for Drug Evaluation and Research

U.S. Food and Drug Administration

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Regulatory Barriers to Innovations in  
Pharmaceutical Manufacturing**

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*\*This presentation reflects the views of the author and  
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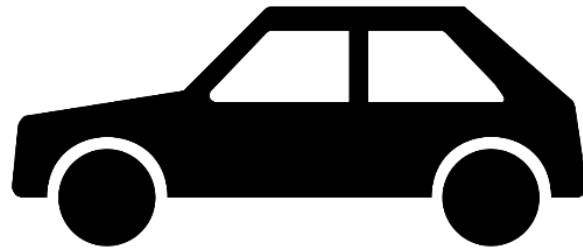
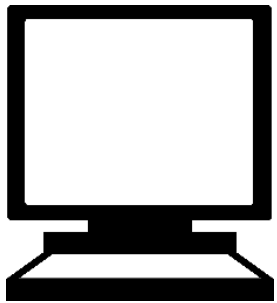


**@QualityKop**

# Pharmaceutical Quality



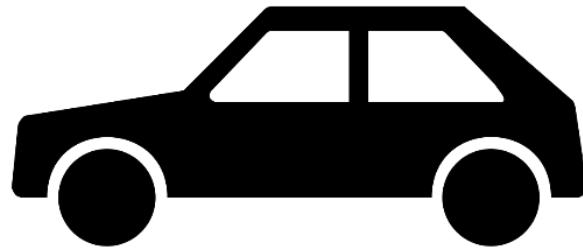
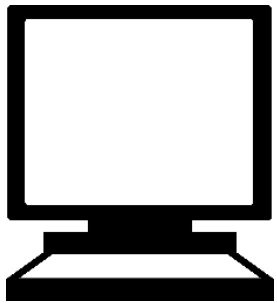
**A quality product of any kind consistently meets the expectations of the user.**



# Pharmaceutical Quality



**A quality product of any kind consistently meets the expectations of the user.**



**Drugs are no different.**

A close-up photograph showing a hand holding an orange pill bottle, pouring three white, oval-shaped pills into the palm of another hand. The background is blurred, focusing attention on the action of taking medication.

**Patients expect safe and effective  
medicine with every dose they take**

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

**Pharmaceutical quality is**  
assuring *every* dose is safe and  
effective, free of contamination  
and defects



A close-up photograph showing a hand holding an orange pill bottle, pouring several white, oval-shaped pills into the palm of another hand. The background is blurred, focusing attention on the action of taking medication.

It is what gives patients confidence  
in their *next* dose of medicine

- **Regulating Pharmaceutical Quality**
- **The Importance of Advanced Manufacturing**
- **Barriers to Innovation**
- **Join Us in a Commitment to Quality**

# Regulating Pharmaceutical Quality

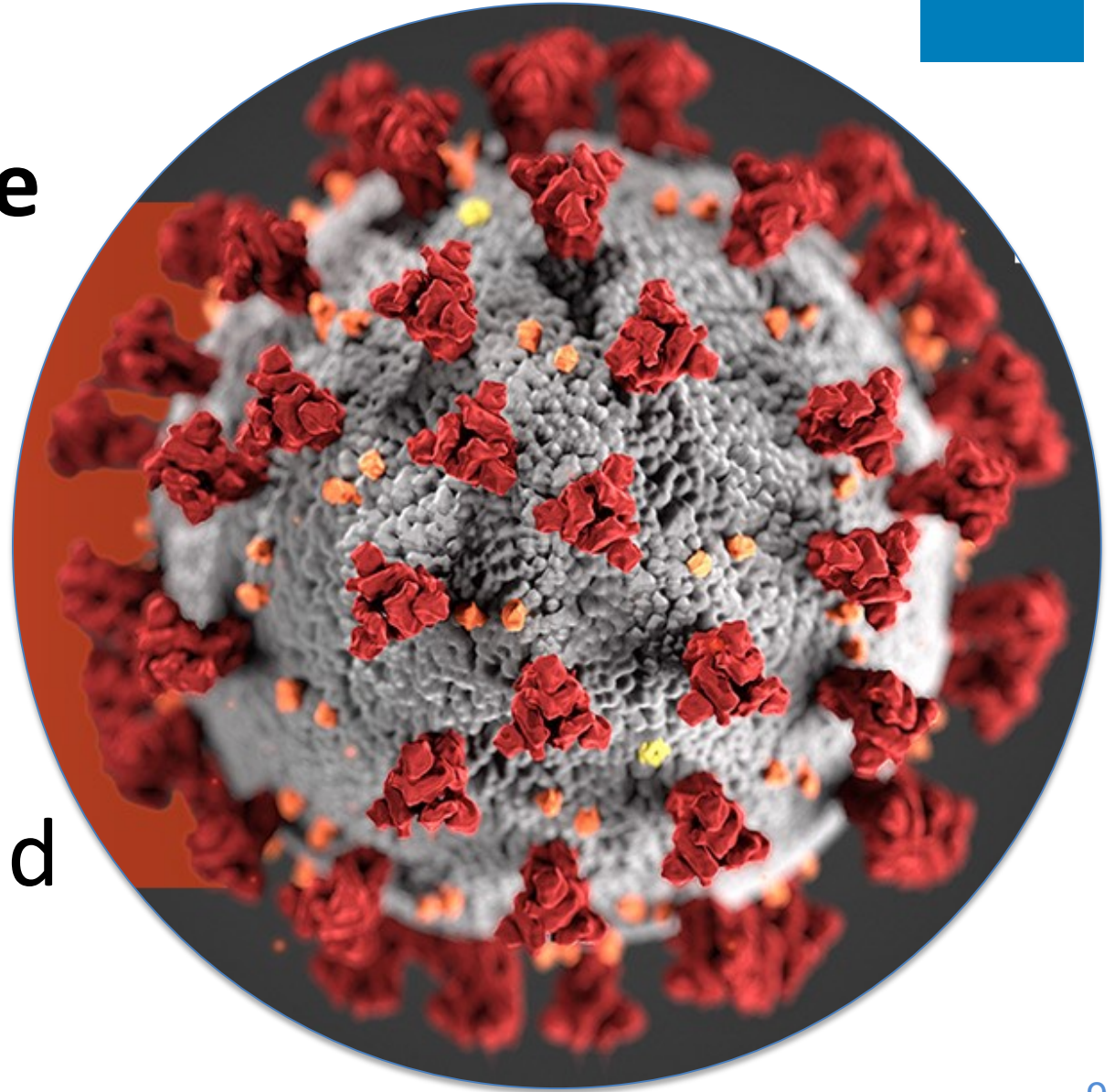
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# The Era of COVID-19

**Existing quality issues are now magnified**

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



# A History of Quality Events

FDA



1938



1962



2015

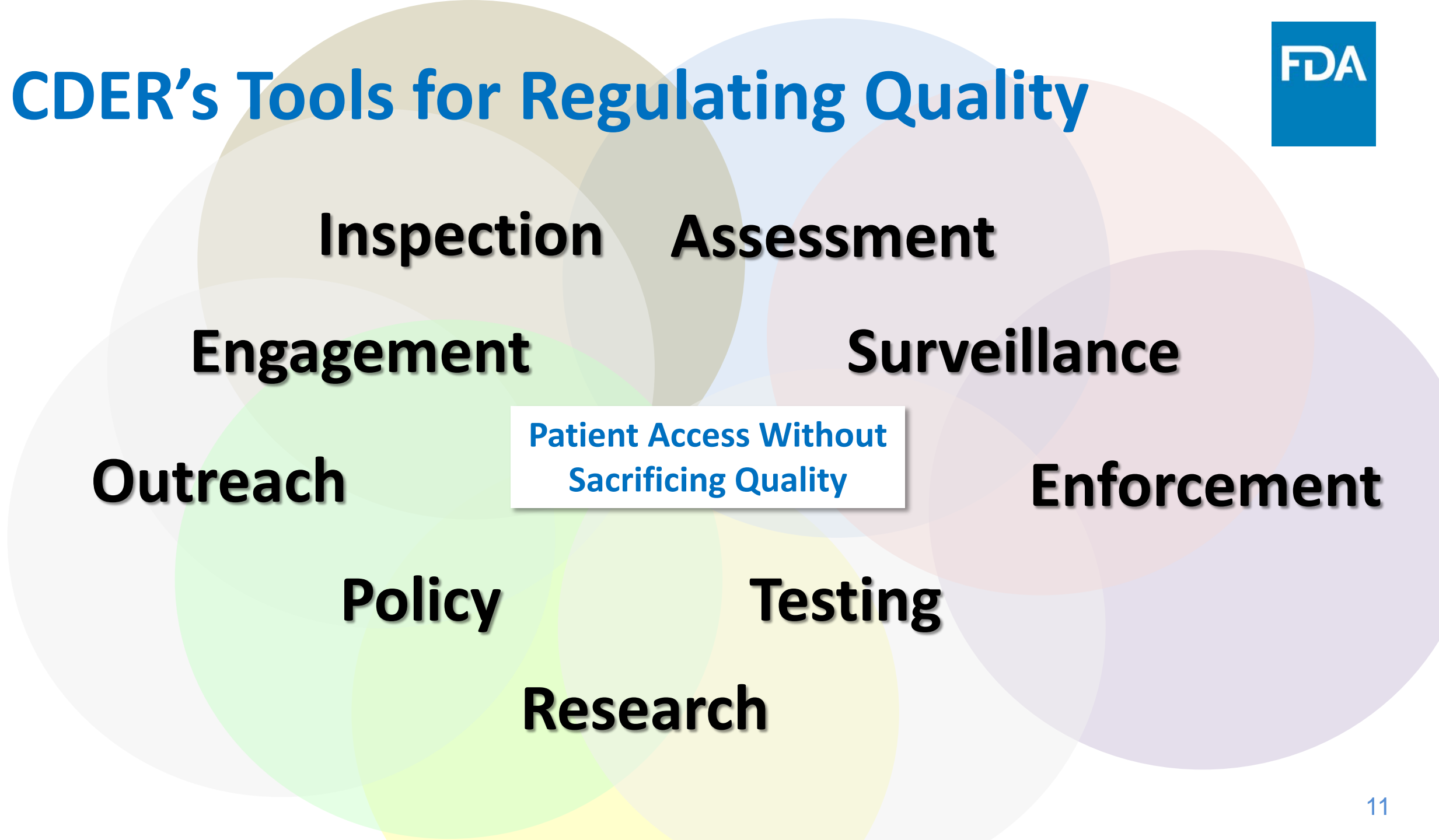
2020?

Disruptions are perfect timing for innovations

We need a “better normal”

Different thinking is required

# CDER's Tools for Regulating Quality



# Office of Pharmaceutical Quality

With a staff of **~1,300**, OPQ's quality assessments in a year are:

- Around **20** biologics
- Around **200** new drugs
- Around **3,000** investigational new drugs
- Around **4,000** generics
- Around **8,000** supplements



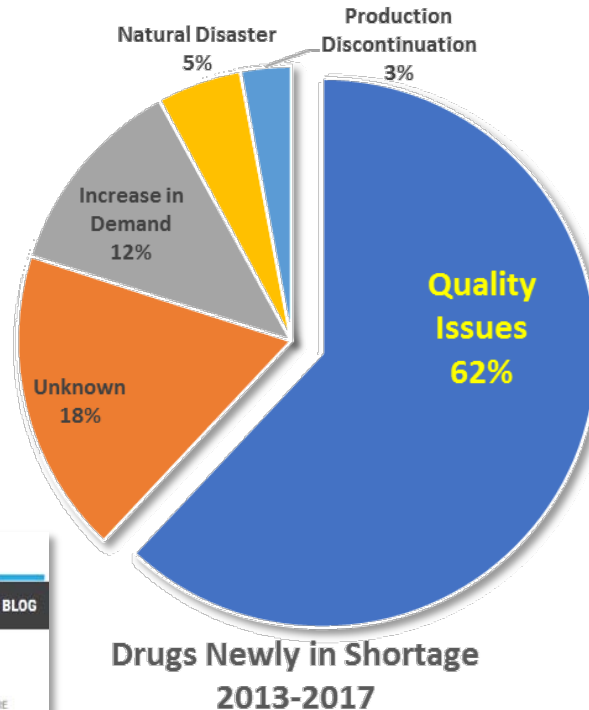
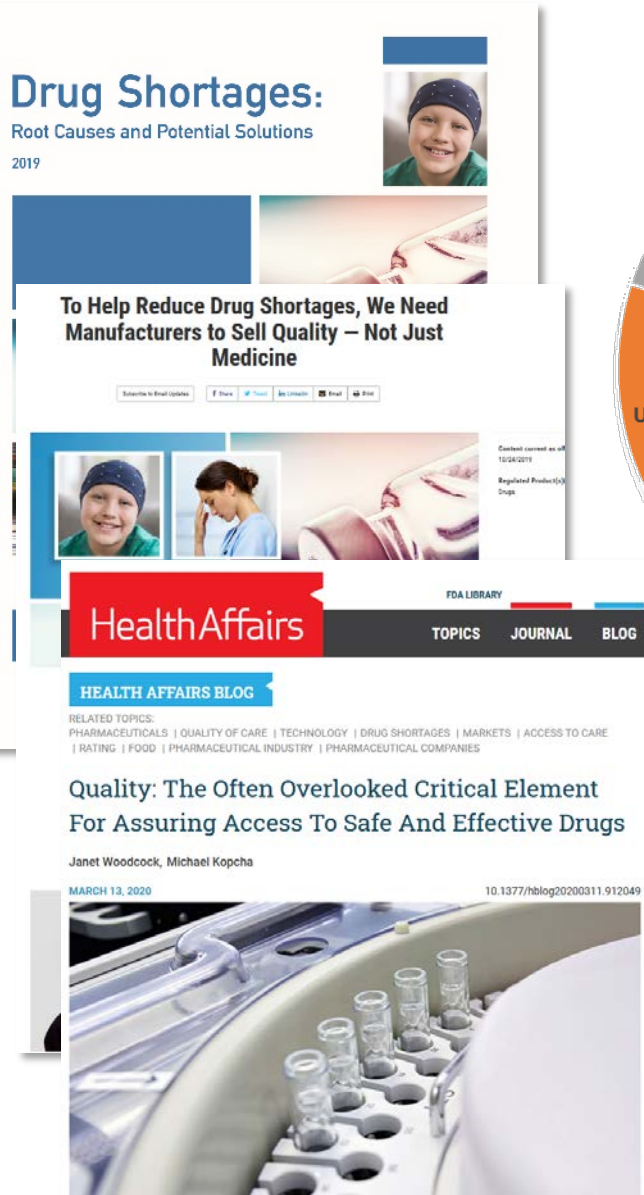


# The Importance of Advanced Manufacturing

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# The Shortage Issue



## Root causes for drug shortages:

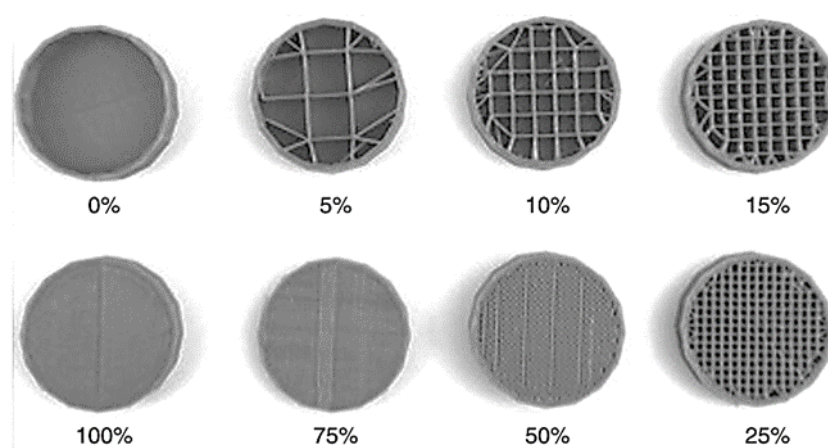
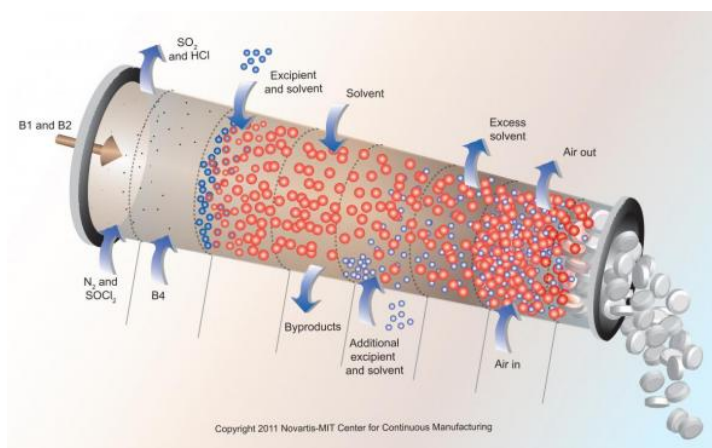
- Lack of incentives for manufacturers to produce less profitable drugs
- Market does not recognize and reward manufacturers for “mature quality systems”
- Logistical and regulatory challenges make it difficult to recover from a **supply disruption**

## Enduring solutions:

- Understanding the impact of drug shortages and the contributing contracting practices
- A ‘rating system’ to incentivize quality management maturity
- Sustainable private sector contracts for a **reliable supply** of medically important drugs

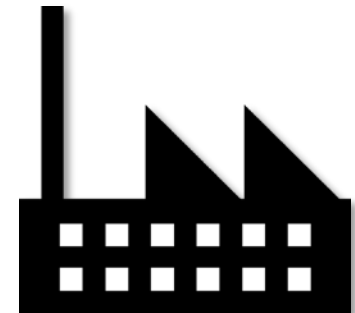
# What is Advanced Manufacturing?

- Novel **manufacturing methods** to improve process robustness and efficiency
- Novel **dosage forms** or delivery systems to improve drug delivery and targeting
- Novel **analytical tools** to improve product quality testing, process monitoring and/or control



# The Importance of Advanced Manufacturing for FDA & Industry

- **Addresses the underlying causes of drug shortages**
  - Mitigate or prevent future production problems
  - COVID-19: Faster commercial production w/o scale-up issues
- **Facilitates new clinical modalities**
  - Precision and individualized medicines
  - A wider range of novel dosage forms and doses
  - Convenient fixed-combination dosage forms
- **Improves manufacturing efficiency**
  - Increase process robustness
  - Lower manufacturing costs
  - Increase supply chain flexibility







# Barriers to Innovation

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# Barriers from a Quality Perspective

**Regulatory**



**Technical**



**Financial**



**Logistical**







# Regulatory

- **Operating within existing regulatory frameworks**
  - CGMPs
  - Validation
- **Post-approval issues**
  - Inspecting new technologies
  - Lifecycle management
- **International harmonization**
  - Regulatory convergence needed



# Technical

- **Inflexibility**
  - Lack of agile manufacturing operations
  - Inflexible thinking & management
- **Inadequacy of analytical science**
  - Advanced Process Analytical Technology (PAT)
  - Enable Real Time Release (RTR)



# Financial

- **Capital required**
  - Grit!
- **Disruption required**
  - New thinking is required to address old and new problems



# Logistical

- **Training requirements**
  - Industry, operators
  - Regulators, investigators
- **Intellectual property**
  - Process patents
- **Lack of strategic partnering in industry**
  - Will everyone come together to make this happen?



# Join Us in a Commitment to Quality

US FDA Center for Drug Evaluation and Research



# WE WANT YOU



**PAYORS**  
**PURCHASERS**  
**PROVIDERS**  
**STUDENTS**  
**COMPOUNDERS**  
**REGULATORS**

**PATIENTS**  
**CONSUMERS**  
**TEACHERS**  
**MANUFACTURERS**  
**PHARMACISTS**  
**HOSPITALS**

# What You Can Do

- **Use this workshop to get to solutions, in a reasonable amount of time.**
- **Help us:**
  - Identify technologies we need to be prepared to see in applications in the next 5-10 years
  - Address key technical and regulatory issues ahead of time
  - Ensure these technologies deliver on the promise of a higher level of manufacturing quality
  - Assure continued access to life-saving medicine for the U.S. public

# One Quality Voice for Patients



FDA U.S. FOOD & DRUG ADMINISTRATION  
OFFICE OF TRANSPARENT, QUALITY SERVICE OF NEW DRUG PRODUCTS

OPQ **Collaborates** so that Quality Medicines are Available to Patients  
**Innovates**  
**Communicates**  
**Engages**

"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

One Quality Voice for Patients. **We are Patients, Too.**  
www.fda.gov

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**Collaborates**  
OPQ **Innovates** so that Better Medicines are Available to Patients  
**Communicates**  
**Engages**

"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

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**Collaborates**  
**Innovates**  
OPQ **Communicates** to Patients that they can Trust the Next Dose of Medicine  
**Engages**

"My friend whose medical struggles and early death definitely factored into my decision to join the FDA in 1993"  
- ONDP Scientist

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**Collaborates**  
**Innovates**  
**Communicates**  
OPQ **Engages** asking YOU to Join us in a Commitment to Quality in the  
Name of the Patient

"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

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## We Are Patients, Too.



A close-up photograph showing a hand holding an orange pill bottle, pouring white, oval-shaped pills into the palm of another hand. The background is blurred, focusing on the action of taking medication.

**Let's work together so we can ALL  
have confidence in our next dose of  
medicine**



**U.S. FOOD & DRUG**  
ADMINISTRATION