

NAVIGATING DRUG SHORTAGES

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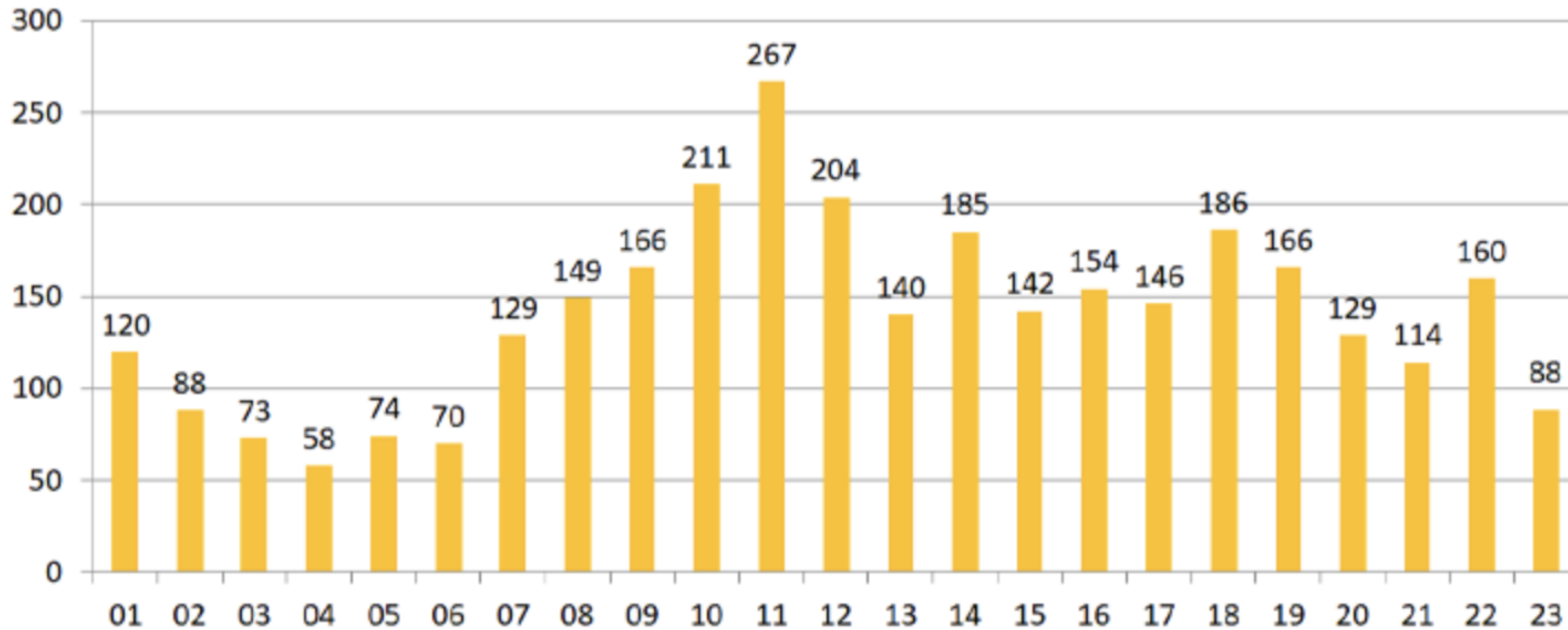
OBJECTIVES

- Describe the causes of drug shortages (RX)
- Review current drug shortages impacting patient care (RX)
- Recommend appropriate therapeutic alternatives for current drug shortages (RX)
- Develop strategies for identifying and mitigating future drug shortages (RX)



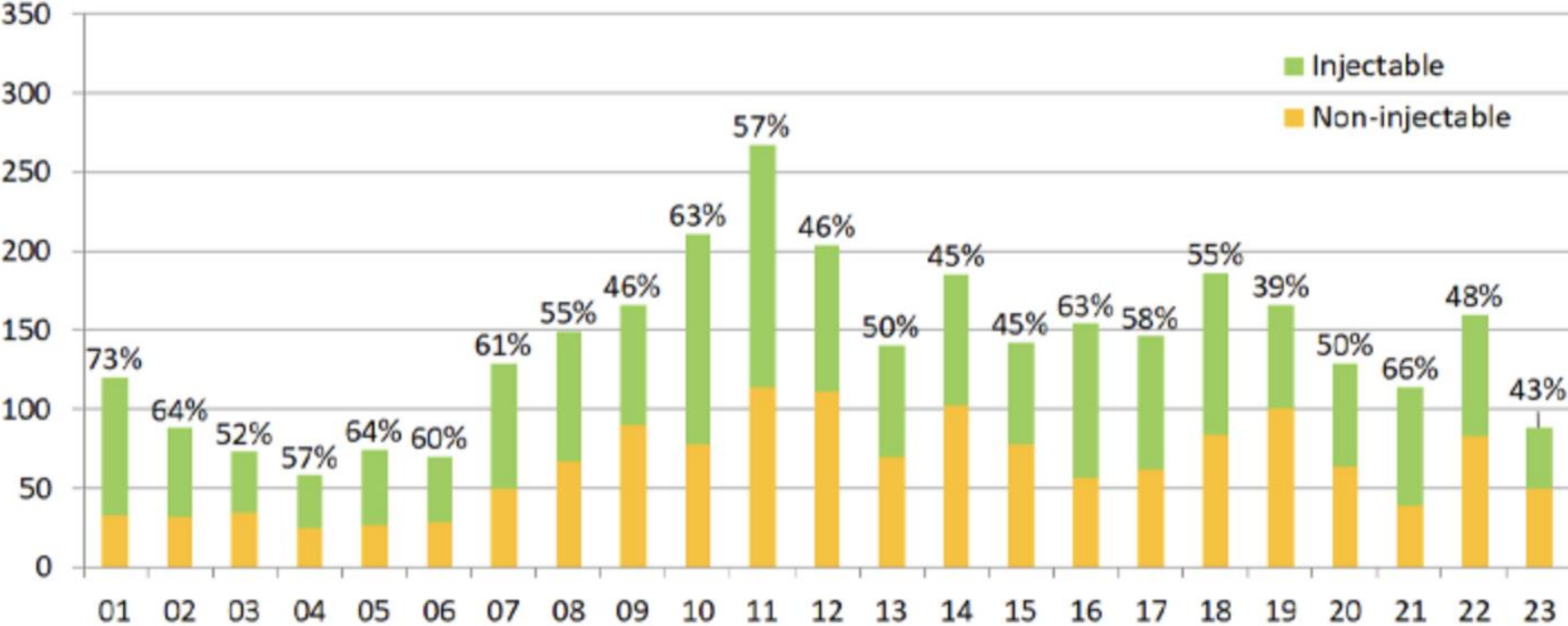
NOT A NEW PROBLEM...

National Drug Shortages New Shortages by Year January 2001 to June 30, 2023



NOT A NEW PROBLEM...

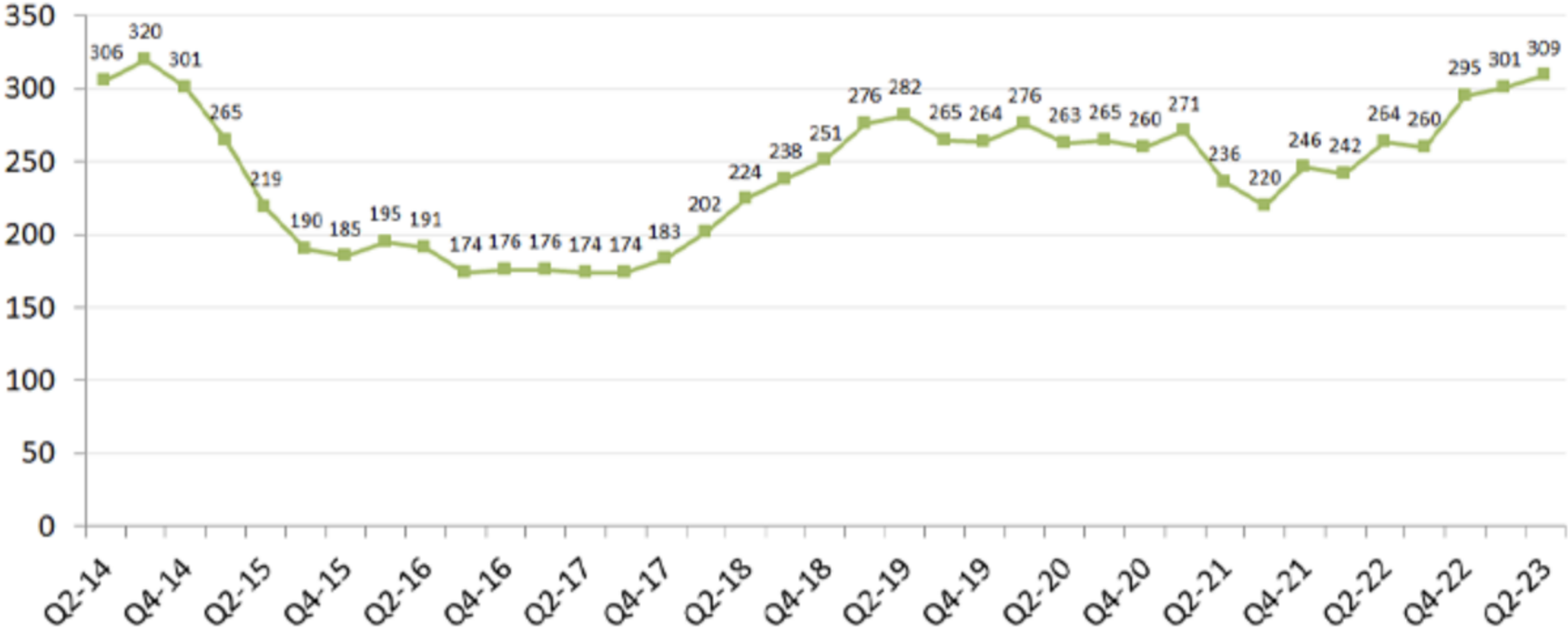
National Drug Shortages New Shortages by Year January 2001 to June 30, 2023, % Injectable



<https://www.ashp.org/drug-shortages/shortage-resources/drug-shortages-statistics>, accessed Sept 25th, 2023

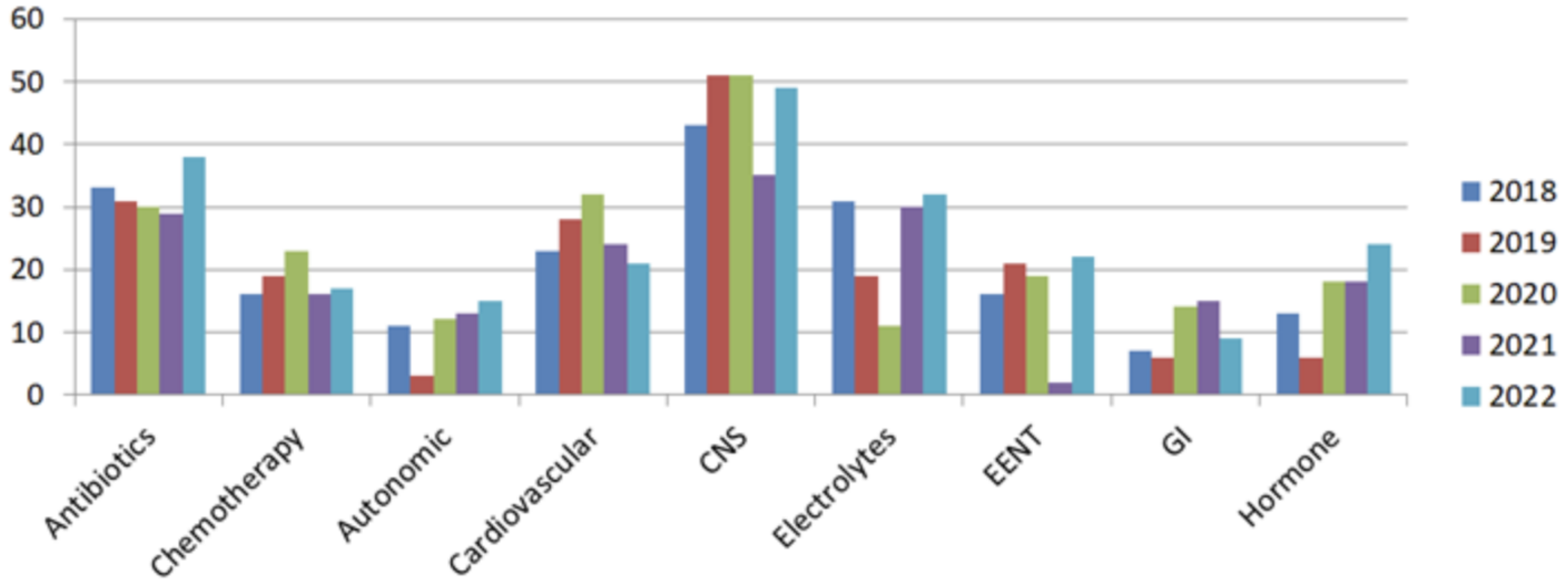
NOT A NEW PROBLEM...

National Drug Shortages Active Shortages by Quarter – 10 Year Trend



WHAT IS IMPACTED?

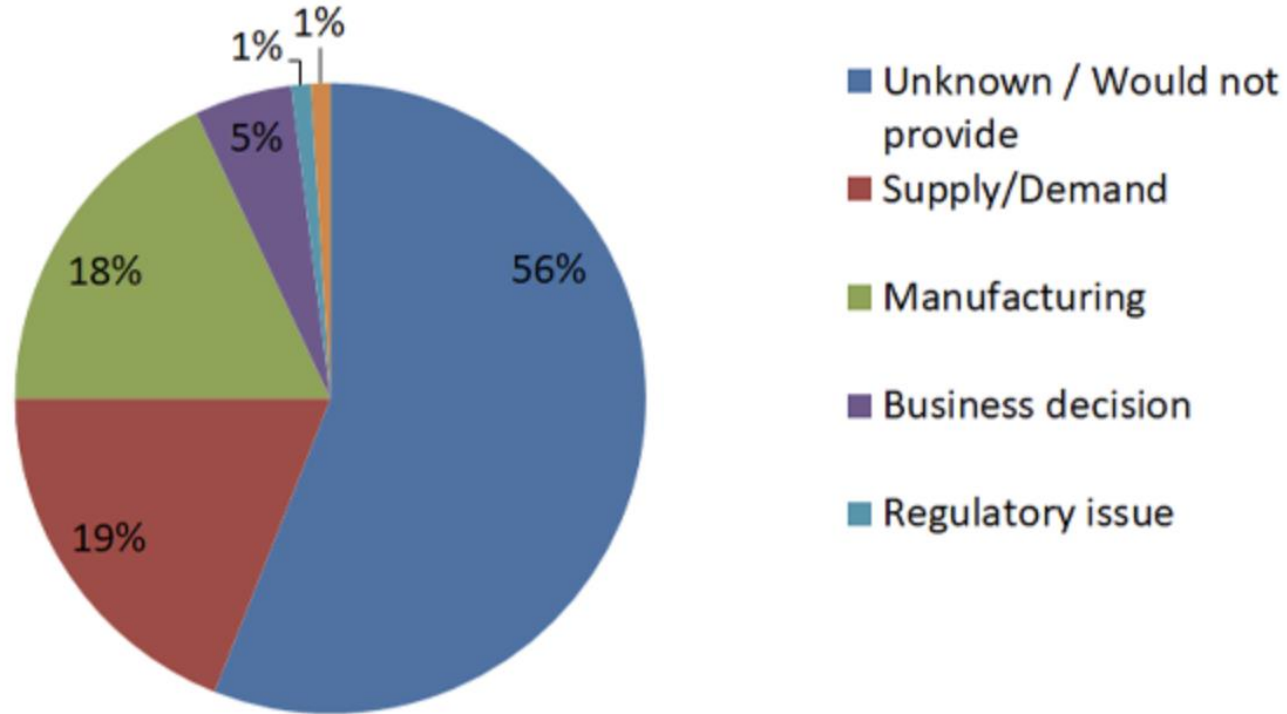
National Drug Shortages Common Drug Classes in Short Supply – 5 Year Trend



WHAT IS IMPACTED?

National Drug Shortages Reasons for Shortages as Reported by Manufacturers During UUDIS Investigation

2022



University of Utah Drug Information Service

CAUSES

Manufacturing issues

Production delays

Changes in supply or demand

Raw material shortages

Supply chain concerns

Tornado-damaged Pfizer plant in North Carolina restarts production

A major Pfizer pharmaceutical plant has restarted production, 10 weeks after it was heavily damaged by a tornado

By The Associated Press
September 25, 2023, 1:12 PM



ROCKY MOUNT, N.C. -- A major Pfizer pharmaceutical plant in North Carolina that makes critical supplies for U.S. hospitals has restarted production about 10 weeks after it was heavily damaged by a tornado, the company announced Monday.

Getting a majority of manufacturing lines at the Rocky Mount facility back up and running is a “proud achievement,” Pfizer said in a statement. Full production across the facility’s three manufacturing sites is expected by the end of the year.

EXTREME WEATHER | Published September 21, 2022 1:49pm EDT

Prescription drug disruptions may arise in Puerto Rico amid Fiona’s damage

Approximately 10% of the U.S. drug supply was manufactured in Puerto Rico in 2017, including products like cholesterol drug Lipitor, blood thinner Xarelto, pain drug Nucynta ER and nerve pain drug Galise, according to Everstream Analytics. The U.S. territory serves as the main hub for companies including Viartis, Bristol-Myers Squibb Company and Johnson & Johnson.

MANUFACTURING INTERRUPTIONS

MANUFACTURING ISSUES

- ~50% of injectable shortages received “failure to comply” letters
- No publicly available quality metrics or dashboards
- 7 companies about for ~80% of all injectable drugs

Often leads to...

PRODUCTION DELAYS (~30%)

- Impact generic medications more frequently
 - Lack of contingency
 - Low profit margins

BUSINESS DECISIONS

- Closing production lines due to reduced or low profits
- Increasing price of manufacturing
- Raw material suppliers
 - Active Pharmaceutical Ingredients suppliers considered proprietary
- “Just in time” inventory management
 - Lower overall inventory supplies
 - Less supply chain resilience
- Product hoarding, stockpiling in response to shortages



PROFESSIONAL CHALLENGES

- Lack of communication or awareness
 - Nationally and locally
- Increase resource utilization
 - Time
 - Cost
- Availability of alternatives?
 - Rationed care for those in need

PATIENT IMPACT

- Increased drug costs
- Increased adverse events
- Increased risk of drug errors
- Increased time
- Increased.....
 - Mortality?

2017 Retrospective study in JAMA showed increased sepsis mortality during a critical norepinephrine shortage in 2011



COMMUNICATION AND
MANAGEMENT

AVAILABLE RESOURCES

American Society of Health System Pharmacists (ASHP)

- <https://www.ashp.org/drug-shortages/current-shortages>
- Sortable by: Current, Discontinued Drugs, Resolved, etc
- Each shortage is reported in several section:
 - Products affected, reason, available products, estimated resupply

<https://www.ashp.org/drug-shortages/shortage-resources>

- Background info and stats
- Some documents/guidelines for management of significant shortages

7/28/2023

Clonazepam Oral Tablets

Products Affected - Description

- Clonazepam oral tablet, Accord, 0.5 mg, bottle, 100 count, NDC 16729-0136-00
- Clonazepam oral tablet, Accord, 0.5 mg, bottle, 500 count, NDC 16729-0136-16
- Clonazepam oral tablet, Accord, 1 mg, bottle, 100 count, NDC 16729-0137-00
- Clonazepam oral tablet, Accord, 1 mg, bottle, 500 count, NDC 16729-0137-16
- Clonazepam oral tablet, Accord, 2 mg, bottle, 100 count, NDC 16729-0138-00
- Clonazepam oral tablet, Accord, 2 mg, bottle, 500 count, NDC 16729-0138-16
- Clonazepam oral tablet, Solco Healthcare US, 0.5 mg, bottle, 100 count, NDC 43547-0406-10
- Clonazepam oral tablet, Solco Healthcare US, 0.5 mg, bottle, 500 count, NDC 43547-0406-50
- Clonazepam oral tablet, Solco Healthcare US, 0.5 mg, bottle, 1000 count, NDC 43547-0406-11
- Clonazepam oral tablet, Solco Healthcare US, 1 mg, bottle, 100 count, NDC 43547-0407-10
- Clonazepam oral tablet, Solco Healthcare US, 1 mg, bottle, 500 count, NDC 43547-0407-50

Reason for the Shortage

- Accord has clonazepam tablets on back order due to a manufacturing issue.
- H2 Pharma has Klonopin available.
- Solco did not provide a reason for the shortage.
- Teva did not provide a reason for the shortage.

Available Products

- Klonopin oral tablet, H2 Pharma, 0.5 mg, bottle, 100 count, NDC 61269-0605-10
- Klonopin oral tablet, H2 Pharma, 1 mg, bottle, 100 count, NDC 61269-0610-10
- Klonopin oral tablet, H2 Pharma, 2 mg, bottle, 100 count, NDC 61269-0620-10
- Clonazepam oral tablet, Teva, 0.5 mg, bottle, 500 count, NDC 00093-0832-05

Estimated Resupply Dates

- Accord has all clonazepam tablet presentations on back order and the company cannot estimate a release date.
- Teva has clonazepam 0.5 mg tablets in 100 count and 2 mg tablets in 500 count bottles on back order and the company estimates a release date in mid- to late-October 2023. The 1 mg tablets and 2 mg tablets are on intermittent back order and the company is releasing product as it become available.

AVAILABLE RESOURCES

FDA Website

<https://www.accessdata.fda.gov/scripts/drugshortages/default.cfm>

- Information is generally aimed at terminal distributors
- Allows for email alerts (can't customize which drugs ☹)

Society of Critical Care Medicine

- <https://www.sccm.org/Clinical-Resources/Drug-Shortages>
- Very detailed management strategies, references
- Not as robust of a database
- Narrow focus

OUTPATIENT

KEY SHORTAGES

Diabetic and
weight loss

ADHD and
stimulants

Clonazepam and
controls

DIABETIC AND WEIGHT LOSS

Semaglutide (Ozempic, Wegovy), tirzepatide (Mounjaro)

- Increased demand driven by weight loss and social media
- Shortage impacting diabetic care

Current status:

- Wegovy- 1.7mg/0.75ml and 2.4mg/0.75ml are available
 - 0.25, 0.5, 1 mg strengths on backorder
- Ozempic more consistent supply, all strengths on allocation
 - Resolution date? *Said* 10/19...
- Tirzepatide “Intermittent backorder”- releasing about once a month

ADHD AND STIMULANTS

- Amphetamine mixed salts (Adderall),
 - 144 different products
 - Stress on Adderall supplies flowed to other products
- DEA limits on raw ingredients
 - Manufacturers say “not enough”
 - DEA claims they use only 70% of allocation
- Increased demand by 45%
 - Post-pandemic
 - Back to school

ADHD AND STIMULANTS

- Dexmethylphenidate (Focalin XR), Lisdexamfetamine (Vyvanse), Mixed amphetamine salts (Adderall XR), Methylphenidate ER (Concerta)
- Current Status
 - Dexmethylphenidate: Release date of mid-to-late October
 - Mixed amphetamine salts: Mostly resolved, intermittent backorder
 - Lisdexamfetamine: recent transition to generic. Low generic manufacturing
 - Good availability 10mg – 50mg
 - Shortage of strengths 60mg – 70mg
 - Expected resolution listed as September 2023
 - Methylphenidate ER: Variable strengths with different generic companies
 - Generic ratings are difficult to interchange based on FDA regulations
 - 40mg, 50mg, 60mg strength resolution December 2023

CLONAZEPAM AND CONTROLS

- Clonazepam
 - Primary manufacturer (Teva) 0.5mg and 2mg mid-late October
 - 1mg is on intermittent backorder
- Lorazepam
 - Primary manufacturer (Teva) 0.5mg and 2mg, late December
 - 1mg early December
- Oxycodone/Acetaminophen
 - Generic availability changes regularly
 - Most resupply notices mid-late October



INPATIENT

KEY SHORTAGES

IV Steroids

Dextrose 50%

Sodium
Bicarbonate

IV CORTICOSTEROIDS

<https://www.sccm.org/sccm/media/PDFs/Drug-Shortage-Alert-Parenteral-Corticosteroids.pdf>

- Methylprednisolone
 - Manufacturing delays
 - Use oral agents where able (prednisone)
 - Restrict utilization to known indications and dosages
 - Supply has stabilized as of mid-October
- Hydrocortisone
 - Manufacturing delays
 - Restrict to patients requiring presser support
 - Consider methylprednisolone + fludrocortisone combinations
 - Release date of September has been pushed back

DEXTROSE 50%

- Manufacturer delays
 - Only two manufactures
- On backorder/allocation
- Resupply date: None provided

- Management:
 - Prioritize oral glucose replacement when patient can tolerate

SODIUM BICARBONATE

- Manufacturer delays
- Vials primarily impacted (Bicarbonate drips)
 - Syringes still generally available (ACLS)
- Resupply date: Late October

- Management:
 - Limit utilization
 - Avoid use in anion-gap elevated acidosis
 - Avoid for hyperkalemia (unless also acidotic)
 - Reduce waste (Crash carts, EMS squads, etc)
 - Short dates can be used to make drips instead of vials

WHAT IS NEXT?

- Who knows?!

IDENTIFICATION AND MITIGATION

Key: Communication!

- Utilize resources like ASHP shortage website
 - Weekly updates and “restock” timelines
- Talk to other providers and pharmacists
- Utilize protocols to reduce utilization and waste
 - Clinical pathways (diabetes, etc)
 - Therapeutic substitutions
- Be as “generic” with prescription writing as possible

SHORTAGE PEARLS FROM PHARMACISTS

- For controlled substances- providers need to call
- When in doubt:
 - Use paper prescriptions
 - Use generic names without reference to brand
 - Ex: Concerta vs Methylphenidate ER
 - “Substitute to available generic”
- Avoid “patient telephone”

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