
Management Case Study:
*Be Prepared –
High Risk Compounding in the Management
of Drug Shortages*


Angela W. Yaniv, Pharm.D.
Assistant Director of Pharmacy
Cleveland Clinic

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Learning Objectives

1. Describe a process to evaluate the feasibility of and then implement a high risk compounding procedure in response to a drug shortage.
2. Identify three requirements for high risk compounding.
3. Discuss materials and techniques used in high risk compounding.

Cleveland Clinic – Main Campus



Sterile Products Compounding

- 5 Clean Rooms
- 1 Immediate Use Satellite
- 870,900 compounded doses

Main Pharmacy Clean Room



Shortages

- "In 2010, there were 178 drug shortages reported to the U.S. Food and Drug Administration (FDA), 132 of which involved sterile injectable drugs. In 2011, there were 251 drug shortages reported, 183 of which involved sterile injectable drugs. FDA continues to see an increasing number of shortages, especially those involving older sterile injectable drugs. These shortages have involved cancer drugs, anesthetics used for patients undergoing surgery, as well as drugs needed for emergency medicine, and electrolytes needed for patients on IV feeding." (www.FDA.gov)

Options

- Therapeutic Substitution
- Inventory management
 - Short-term and lower use drugs
- Aliquotting
 - Extend supply when larger vials are available
- Outsourcing
 - If allowed
 - Know your outsourcer!
- Compounding from active pharmaceutical ingredients


Compounding - Be Prepared

- Know your limits (and stick to them)
 - High risk compounding (yes/no)
 - Extended dating (yes/no)
 - Volume capacity
- Assess your capabilities
 - Clean room
 - Equipment
 - Staff training and expertise

High Risk Compounding Requirements

- USP <797> compliant clean room
- High-risk media fill testing
- Staff training
- Process development
 - If you don't do this all the time, what processes can you do safely when the need arises?
- Equipment
- Sterilization methods
 - Heat
 - Filtration
- Bottom line – If you are not comfortable, don't do it.


True or False:

Before high risk compounding, compounding personnel must complete and pass a high risk media fill competency. 

A True

B False

True or False:

All products can be sterilized by cold filtration. 

A True

B False

Questions

- How much do we have on hand?
- How long do we expect the shortage to last?
- Alternate manufacturer or size available?
 - If so, is the supply adequate to meet needs?
- Therapeutic alternative available?
 - If so, do you need P&T approval to move forward?

Can't address the shortage with these strategies?

More Questions

- Compounding recipe available?
 - Referenced
 - USP monograph
- Required equipment in place?
 - pH meter
 - Sterilizing equipment
 - Final containers, etc
- USP-grade active pharmaceutical ingredient available?
 - Certificate of analysis
- End-product testing?
 - Potency/Stability
 - Sterility
 - Pyrogens

Scenarios

- Sodium Bicarbonate
 - How much? A lot
 - Alternatives? No
 - Recipe? Yes
 - Potency testing? Not readily available
- Needed for subsequent compounding
- Compound daily
- No extended dating (72 hour – refrigerated)
- Waste potential \$ < sterility testing \$

Scenarios

- Papaverine
 - How much? A lot
 - How long? Unknown
 - Recipe? Yes
 - Alternatives? 1 mL vials, but inadequate to meet needs
- Distribution in ADC's
- Compound in batches
- Extended dating
 - Quarantine for Sterility and pyrogen testing
- Potency testing

Compounding Process and Documentation

- Standardize frequently used compounding processes
- Standard work sheets
- Labeling requirements
 - Bar-coding
 - Sound alike-Look alike

Sample Compounding Worksheet

Compounding Information

Ingredient	Amount	x	Name	Strength	Final	Final
					Yield	Strength
Papaverine HCl USP	150 mg					
Hydrochloric Acid USP	10 mL					
Distilled Water USP	5 mL					
Distilled Water for Injection USP	100 mL					
Other and not defined above						
Empty Vials, 5 mL	200					
Non-Proprietary Batch Number						
Empty Batch Container						
Batch #/Container						
Batch/Container						

Final Product Verification

Batch	Yield	Strength
200		

Program Test

Test	Result
Potency	PASS / FAIL
Sterility	PASS / FAIL
Pyrogen	PASS / FAIL

End of the Day


- Always ask yourself:
 - Will this keep me up at night?
- If the answer is yes:
 - Keep looking for another alternative, or
 - Develop the skills and knowledge to do it right
- If the answer is no:
 - Make sure you do it right

True or False:

High risk compounding should be the method of last resort to address a drug shortage situation.

A True

B False



Patient Safety = Knowledge + Care

