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# Drug Shortages – PDA's Approach to Prevention and Management

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# Presentation to Animal Pharmaceuticals Supply Chain Interruption

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# Agenda

- Introduction
- Why Does a Drug Shortage Occur?
- Examples
- PDA's Approach to Prevention and Management
- QRM – Quality Risk Management
- Risk Levels and Risk Priority
- Drug Shortage Prevention and Response Plan
- Introduction to Workshop



# Why Does a Drug Shortage Occur?

Is it a 'good' shortage if Sales exceed Marketing forecasts?



# Why Does a Drug Shortage Occur?

Is Someone 'Gaming' the System?



# Why Does a Drug Shortage Occur?

Is it Not Worthwhile Making?  
(Business Decision)

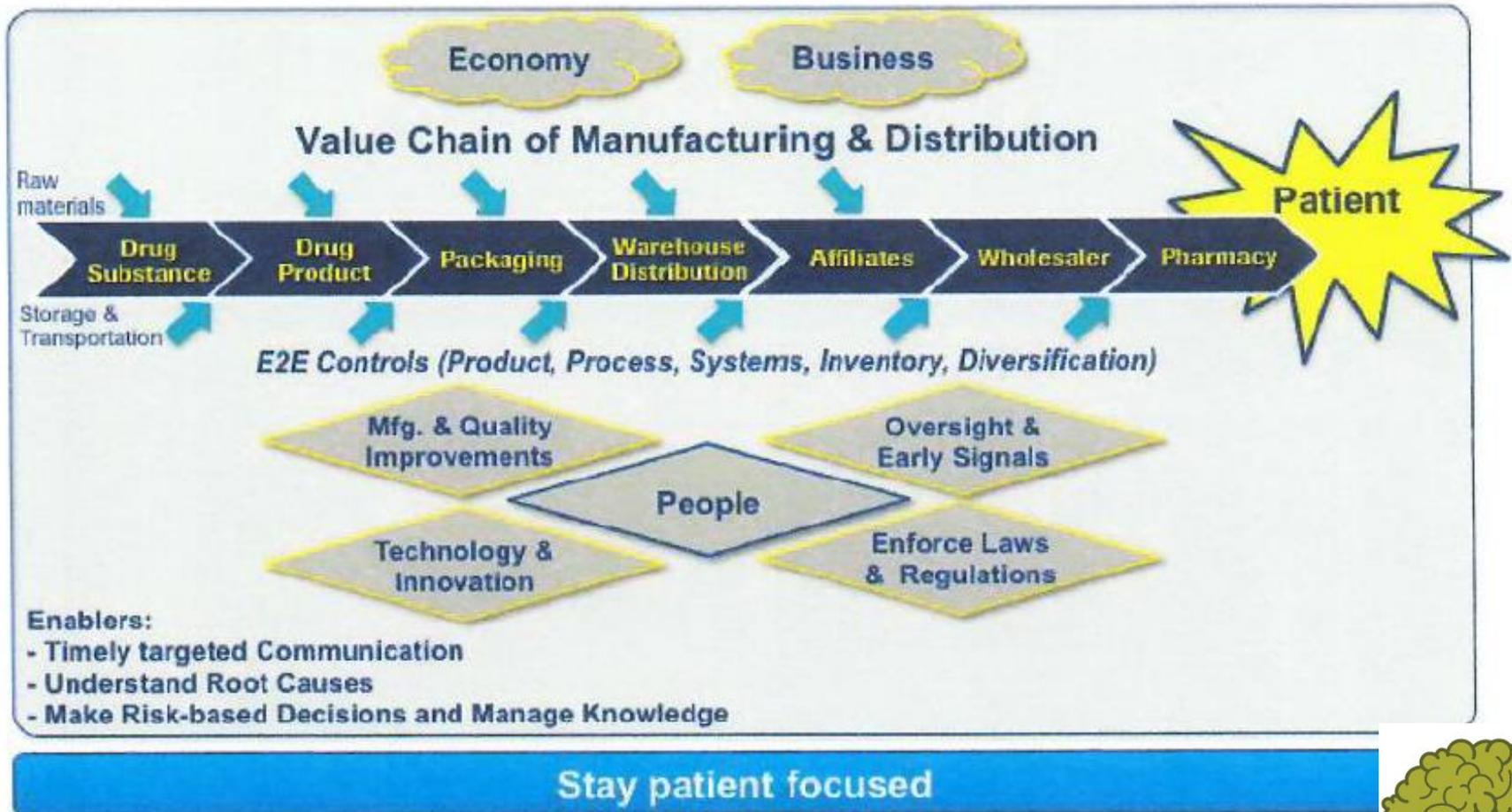


# Why Does a Drug Shortage Occur?

Would a Shortage Occur During a New Product Launch?



# PDA's Approach to Prevention and Management of Drug Shortages



# Sources of Risks of Shortage

Anywhere in the Value Chain

- Potential Risk to
  - API
    - Unreliable Source
    - Poor Specifications Resulting in Rework
  - Aging Facility
    - Unreliable Equipment
    - Unreliable Utilities
    - Regulatory Issues



# QRM – Risk Ranking

Risk Ranking	Risk to Patients (product quality and/or product availability)	Risk to GMP Compliance
High	<ul style="list-style-type: none"> <li>• Irreparable patient harm or death</li> <li>• <i>Shortage of a medically necessary (life supporting or life sustaining) product</i></li> </ul>	<ul style="list-style-type: none"> <li>• Consent decree or warning letter</li> <li>• Withdrawal of GMP certificate or manufacturing authorization</li> <li>• Critical health authority observations or repeat inspection observations</li> <li>• Systemic breakdown of GMP systems</li> <li>• Recall</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• Reversible patient harm</li> <li>• <i>Shortage of product used for acute short-term or chronic long-term product indications</i></li> </ul>	<ul style="list-style-type: none"> <li>• Major health authority observations</li> <li>• High complaint rate</li> </ul>
Low	<ul style="list-style-type: none"> <li>• No product or patient impact</li> <li>• <i>No shortage or multiple sources available for products that are not medically necessary</i></li> </ul>	<ul style="list-style-type: none"> <li>• Minor observations</li> <li>• Minor departures from GMPs</li> </ul>



# The Process

The Matrices should be applicable to all circumstances –

- Your firm may chose to evaluate the risk definitions
- The Key is:
  - Identify the highest risk (Priorities)
  - Take steps to reduce that risk (Mitigate)



# QRM – Impact to the Patient

			Availability of Alternatives		
			No Alternatives Available	Alternative Products Available: Similar Therapy	Exact Product Available but in Other Presentations
Therapeutic Use & Consequences if Product not Available	Medically Necessary Product, Life supporting or Life sustaining	Fatal or severe irreversible harm if the patient is not treated with the product	Risk Level A	Risk Level A	Risk Level B
	Acute short term or chronic long term	Severe harm but reversible if patient is not treated with the product	Risk Level A	Risk Level B	Risk Level C
	Other indications	Inconvenience if patient is not treated with the product	Risk Level B	Risk Level C	Risk Level C



# The Process

A Couple of Slide Back –

- Matrix described risk in terms of risk to the patient and risk to cGMP compliance
- Going forward, our focus will be on the risk to the patient
  - Addressing risk to the patient is not an excuse to short-cut GMPs



# QRM – Risk Levels

Product	Therapeutic Use	Consequences if Product not Available	Availability of Alternatives	Risk Level
Targeted biologics for oncology treatment (Trastuzumab)	Medically necessary product, life supporting or life sustaining	Death or severe irreversible harm	No alternatives available	Risk level A
Antibiotics (Azithromycin or Ciprofloxacin)	Medically necessary product, life supporting or life sustaining	Death or severe irreversible harm	Alternative products available: similar therapy	Risk level A
Diabetes treatment (Insulin)	Medically necessary product, life supporting or life sustaining	Death or severe irreversible harm	Alternative products available: similar therapy	Risk level A
Congestive heart failure medicine (Digoxin)	Medically necessary product, life supporting or life sustaining	Death or severe irreversible harm	Exact product available but in other presentations	Risk level B
Epilepsy medicine (Diazepam)	Acute short-term or chronic long-term condition	Severe, reversible harm	Alternative products available: similar therapy	Risk level B
Plasma protein therapies	Acute short-term or chronic long-term condition	Severe, reversible harm	Exact product available but in other presentations	Risk level C
OTC Cough suppressants (Robitussin)	Minor indications	Inconvenience	Alternative products available: similar therapy	Risk level C



# The Process

This is where your products fit into the matrix  
Based on the therapeutic use, consequence if a shortage occurs, and availability of alternatives, a Risk Level is assigned.

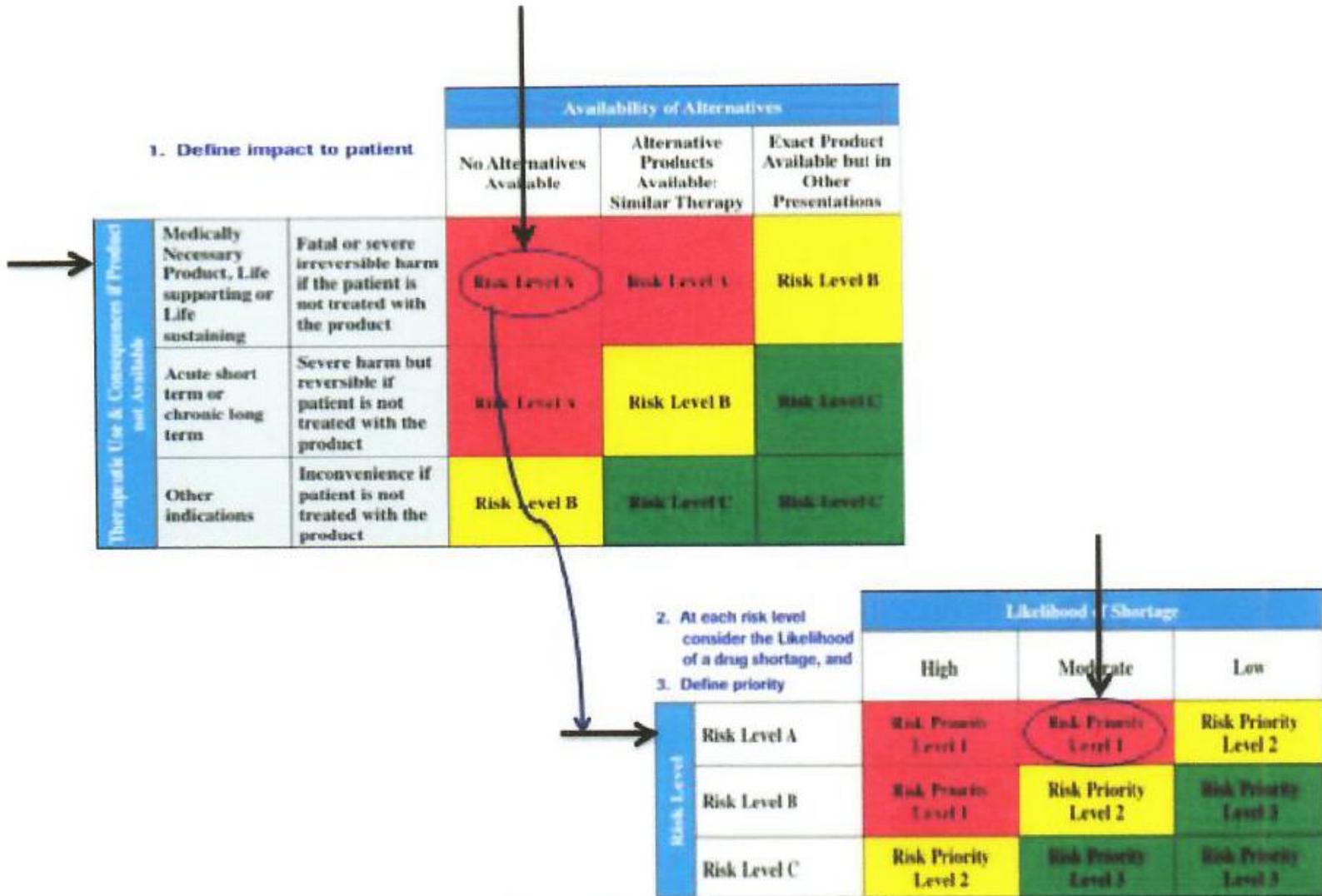


# QRM – Risk Priority

		Likelihood of Shortage		
		High	Moderate	Low
Risk Level	Risk Level A	Risk Priority Level 1	Risk Priority Level 1	Risk Priority Level 2
	Risk Level B	Risk Priority Level 1	Risk Priority Level 2	Risk Priority Level 3
	Risk Level C	Risk Priority Level 2	Risk Priority Level 3	Risk Priority Level 3



# QRM – Risk Triage



# The Process

That Risk Level, A, B or C, then is matched up with information from your Risk Assessment

- Is the risk of the shortage
  - High
  - Medium
  - Low
- What is the resulting Risk Priority?



# QRM -Risk Controls

Risk Priority	Suggested Controls
<b>Level 1</b>	<ul style="list-style-type: none"><li>• <b>Appropriate inventory and safety stock management</b></li><li>• <b>Multi site sourcing with higher manufacturing capacity reserves</b></li><li>• <b>Supplier management controls (see sec. 5.4 of TR54)</b></li><li>• <b>Supply chain/transportation line security, business continuity and communication plan</b></li><li>• <b>Extended Value Stream Mapping (VSM)</b></li></ul>
<b>Level 2</b>	<ul style="list-style-type: none"><li>• <b>Consider multi site sourcing</b></li><li>• <b>Value Stream Mapping (VSM)</b></li><li>• <b>Proactive inventory management</b></li><li>• <b>Process capability and robustness exercised (with Quality Metrics)</b></li></ul>
<b>Level 3</b>	<ul style="list-style-type: none"><li>• <b>Generally accepted risk level</b></li></ul>



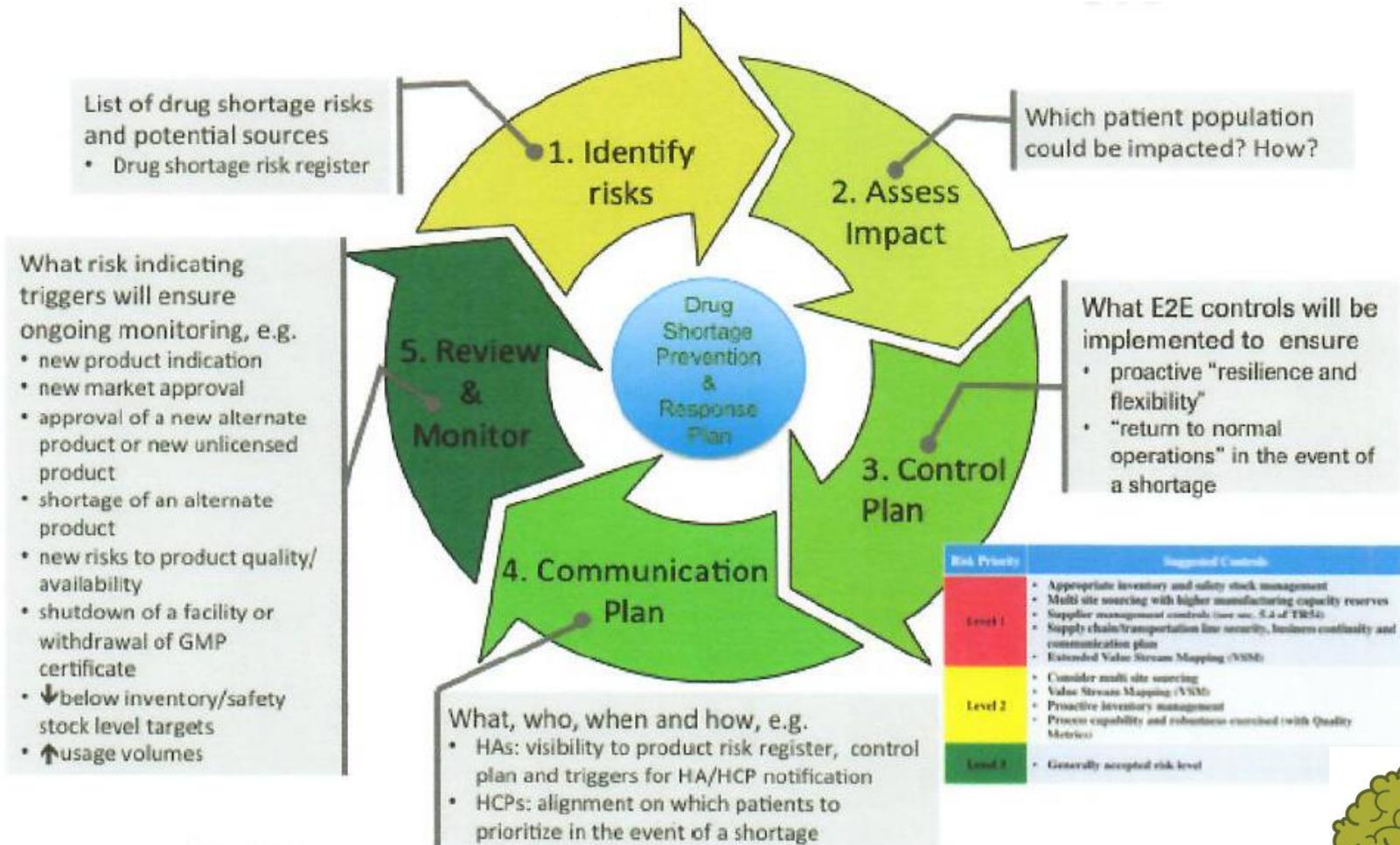
# The Process

The Risk Priority shows where your firm should focus its resources

- Suggested controls to mitigate risk
- Remember – what is done from a new product launch?



# Drug Shortage Prevention and Response Plan



# Introduction to Workshop

Based on the Worksheets from the Technical Report

- You can chose to use a product from one of your firms
  - Best results for practice are for ‘legacy’ products
- Alternatively, you can create Product ‘X’ and create a scenario
  - A product that lands in Risk Priority Level 3 will not provide much experience using the tool
- Use additional paper to describe the reasons for selecting the ‘Probability of Shortage’



# Questions



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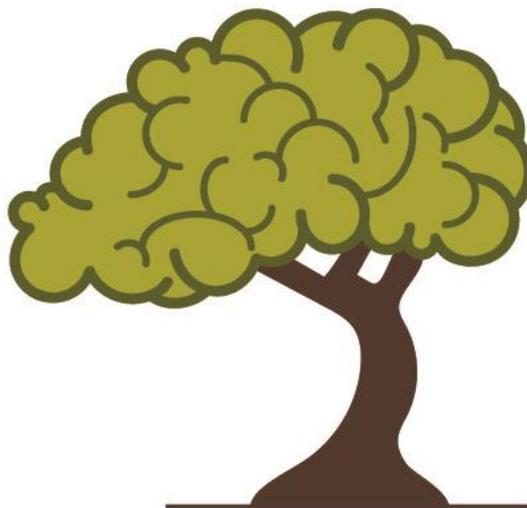
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