

Failure Mode and Effects Analysis

Pre OPIS Process for Blood Work and Order Entry in the Oncology Clinic

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Introduction

FMEA is a team-based systematic and proactive approach for identifying:

- ways that a process or design can fail
- why it might fail
- the effects of that failure, and
- how it can be made safer

Objectives

- Prior to the implementation of the Cancer Care Ontario CPOE system a Pharmacy, Nursing and Laboratory Team looked at the medication related processes in the Oncology Clinic to identify high risk process points.
- To prioritize mitigation of risk based on risk priority number.

Methodology

Step 1: Select high risk processes and assemble the team.

High risk processes generally have one or more of the following:

- Variable input.
- Complexity.
- Lack of standardization.
- Tight coupling.
- Heavily dependent on human intervention.
- Time constraints that are too tight or too loose.
- Hierarchical versus team orientation.

Step 2: Diagram the process.

- Define beginning and end of process under analysis.
- Chart the process as it is normally done.
- Using the collective process knowledge of the team, a flow chart is sketched.
- Process diagrams are the most common.

Step 3: Brainstorm potential failure modes and determine their effects.

Step 4: Identify the causes of failure modes.

- Single point weakness is a step so critical that its failure will result in a system failure or adverse event.
- All single point weaknesses should be acted upon.

Step 5: Prioritize failure modes based on Risk Priority Number (RPN).

- Score severity of effect of failure mode. (If 5, always address it.)
- Score frequency of occurrence of failure mode.
- Score likelihood of detection of failure prior to the impact of the effect being realized.

Step 6: Redesign the processes.

- Apply strategies to reduce severity and frequency and increase detection.
- High leverage to low leverage error prevention strategies.

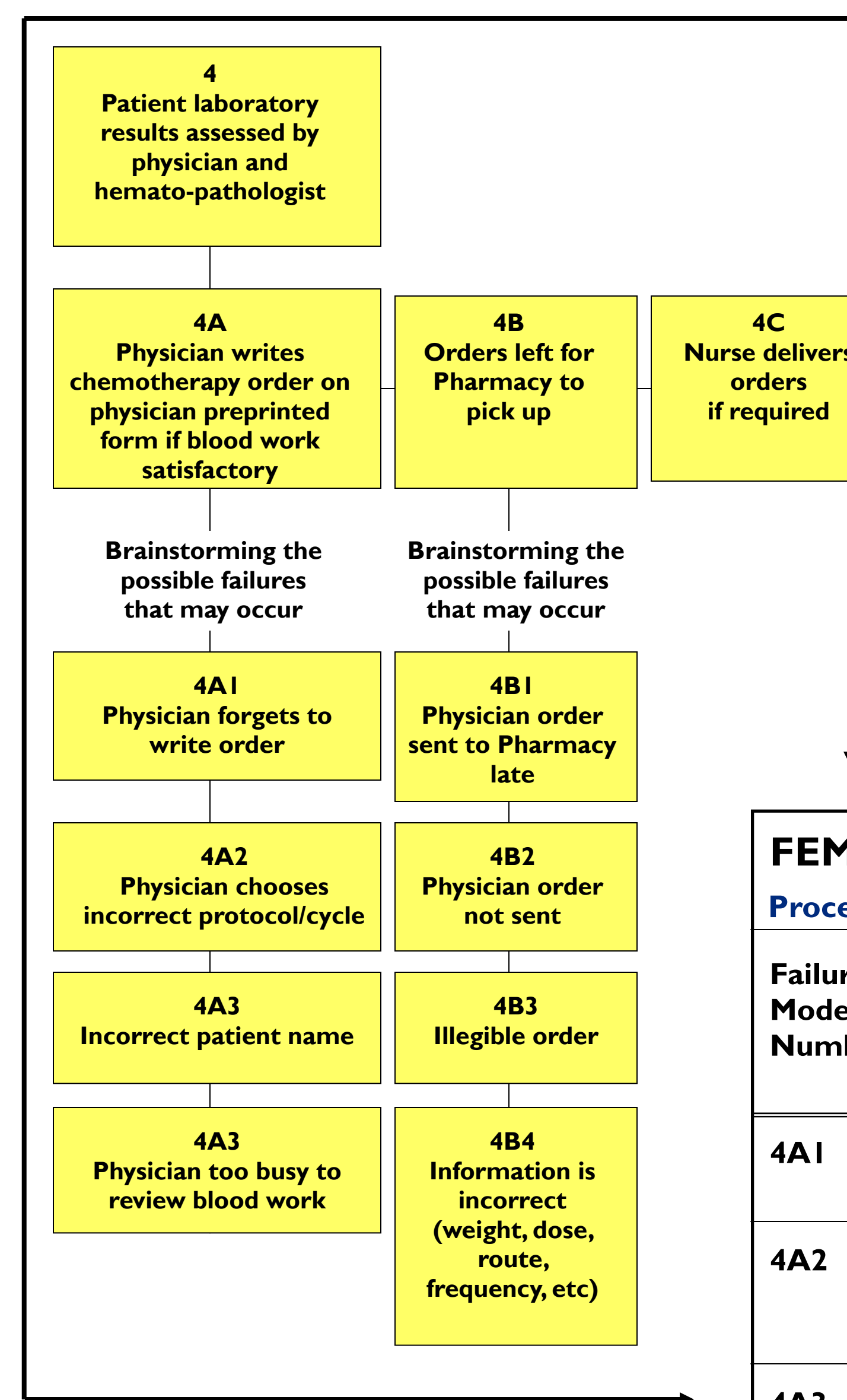
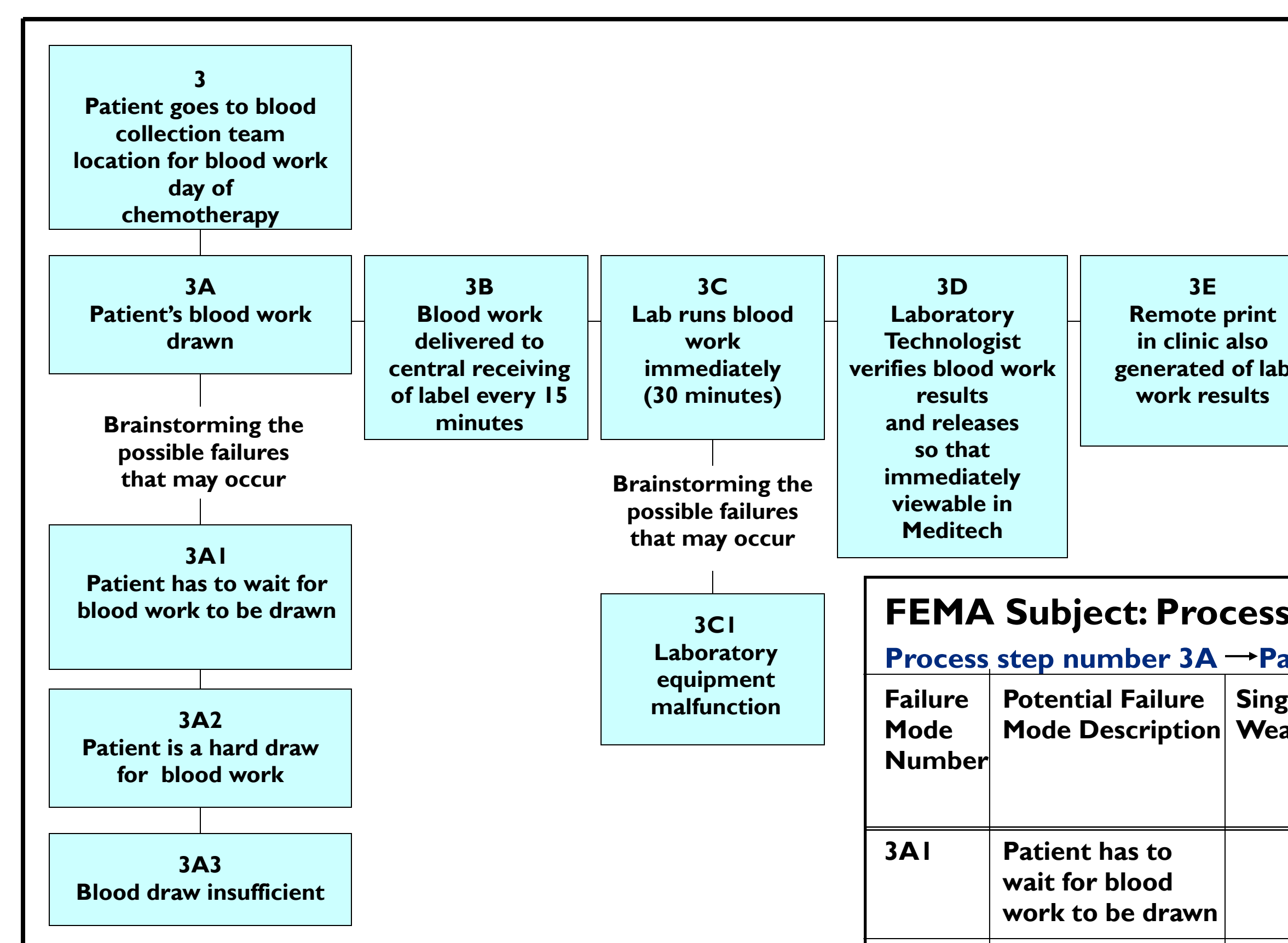
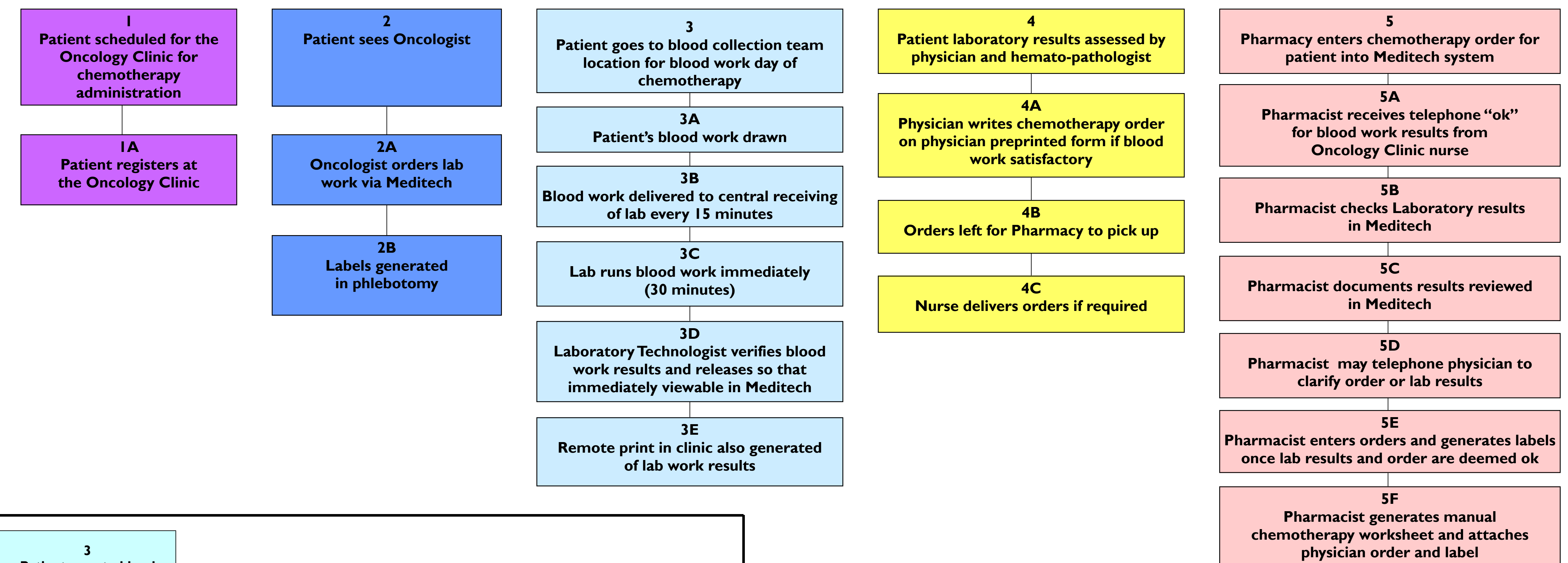
Step 7: Analyze and test the changes.

- Conduct FMEA of redesigned process.
- Use simulation testing whenever possible.
- Conduct pilot testing in one area.

Step 8: Implement and monitor the redesigned processes.

- Communicate reasons for process change.
- Find change agents.
- Define process and outcome measures.
- Monitor overtime.

PRE-OPIS PROCESS FOR BLOOD WORK AND ORDER ENTRY IN THE ONCOLOGY CLINIC



Failure Mode and Effects Analysis Worksheet			
Failure Mode: What could go wrong?	Severity: 1-5, 1= no effect, 2= slight, 3= moderate, 4= major, 5= severe	Failure Causes: Why would the failure happen?	Failure Frequency: 1-5, 1= yearly, 2= monthly, 3= weekly, 4= daily, 5= hourly
Failure Effects: What would be the consequences of the failure?	Detectability: 1-4, 1= always, 2 = likely, 3 = unlikely, 4 = never		
Risk Priority Number (RPN): Severity x Failure Frequency x Detectability			

FEMA Subject: Process for Oncology Clinic									
Process step number 3A — Patient's blood work drawn									
Failure Mode Number	Potential Failure Mode Description	Single Point Weakness	Potential Effect (s) of Failure	Potential Cause(s) of Failure	Severity	Failure Frequency	Detectability	RPN	Actions to reduce risk
3A1	Patient has to wait for blood work to be drawn		Increased wait time for pharmacy to receive orders	Phlebotomist not available until 8:45	4	5	2	40	Phlebotomist should be available
			Workflow bottleneck for pharmacy	Collection team is not dedicated to Oncology Clinic (on pager for stats, general medicine)	4	5	2	40	Blood work drawn day prior to chemotherapy Oncology Program discussed this change with patients and patients agreed. Patient satisfaction survey indicated a higher level of patient satisfaction with new process
			Increased wait time for nursing to administer drug	Patients with PICC lines can only be drawn by oncology nurse impacting oncology nurse workload—nurse takes blood directly to lab	3	5	2	30	Phlebotomists to be trained to do PICC draws
			Delay in treatment	Patient not informed that blood work is required	3	4	2	24	
			Delay in treatment	No Patient list for phlebotomist	3	3	1	9	
			Delay in treatment	Downtime procedures in effect	2	1	2	4	Review/update Downtime Procedures
3A2	Patient is a hard draw for blood work		Delay in treatment	Patient veins are difficult to access by phlebotomist	2	4	1	8	

FEMA Subject: Process for Oncology Clinic									
Process step number 4A — Physician writes chemotherapy order on physician preprinted form if blood work satisfactory									
Failure Mode Number	Potential Failure Mode Description	Single Point Weakness	Potential Effect (s) of Failure	Potential Cause (s) of Failure	Severity	Failure Frequency	Detectability	RPN	Actions to Reduce Risk
4A1	Physician forgets to write order		Delay in treatment	Physician busy	5	4	3	60	OPIS Implementation
4A2	Physician chooses incorrect protocol/cycle		Delay in treatment	Physician busy	5	3	3	45	OPIS Implementation
4A3	Incorrect patient name		Wrong medication administered	Wrong addressograph used	5	2	3	30	OPIS Implementation
4A4	Physician too busy to review blood work		Delay in treatment	Too many patients booked at the Oncology Clinic	3	4	3	36	Blood drawn day prior to chemotherapy

Conclusions

- Patients agreed to blood work draw day prior to chemotherapy. Patient satisfaction with this new process was evaluated and was positive.
- Successful implementation of OPIS has significantly reduced the risk of errors associated with chemotherapy order process.