

Texas Children’s –Simulation-based Test (SbCST)
Project: Main Campus MPERT Walkthrough COVID-19 PUI
PRELIMINARY Report of Findings with Failure Modes and Effects Analysis (FMEA)

<u>Background/Definitions</u>	<u>Use of Clinical Simulation to Promote High-Reliability in Healthcare</u>
<p>High-reliability science is the study of organizations in industries like commercial aviation and nuclear power that operate under hazardous conditions while maintaining safety levels that are far better than those of health care. These organizations have become known as High-Reliability Organizations (HROs). Five key principles of organizational safety culture have emerged as drivers of high reliability (Weick & Sutcliffe, 2007):</p> <ul style="list-style-type: none">• Preoccupation with failure• Reluctance to simplify observations• Sensitivity to front-line operations• Commitment to resilience• Deference to expertise <p>Hospital quality and patient safety departments are increasingly examining the potential of adapting and applying the lessons of HRO science to health care to reach levels of quality and safety that are comparable to those of the best high-reliability organizations.</p> <p><i>In situ</i> simulation, a simulation that is physically integrated into the clinical environment provides a method to improve teamwork, communication, and patient safety in high-risk patient care areas. The most valuable benefits of in situ simulation are likely related to the identification of latent hazards, knowledge gaps, and opportunities for clinical teams to rehearse infrequent and/or high-risk clinical scenarios.</p>	<p>Simulation-based Clinical System Testing (SbCST) is a robust process improvement tool that can be used to proactively test the complex systems (people + physical environment + processes) involved in new patient care settings. By involving front-line personnel in clinical simulations aimed at stressing systems to find potential threats to patient/provider safety (LST – latent safety threats), it applies at least 3 HRO principles: Preoccupation with failure, Reluctance to simplify observations, and Sensitivity to front-line operations.</p> <p>Failure Modes and Effects Analysis (FMEA) is an established and widely used means of proactively seeking out both latent and active weaknesses and failures in healthcare systems to analyze causes, assess risk, and address resolutions (The Joint Commission, 2005). Joint Commission requires the incorporation of FMEA into patient strategies for hospital accreditation. By adding the optional tool of FMEA Risk Prioritization to the SbCST findings, new hospitals can both prioritize how to address SbCST findings AND meet the Joint Commission requirement before their first accreditation survey.</p> <p style="text-align: center;"><u>Overview of this SbCST</u></p> <p>A simulation walkthrough of the Main Campus MPERT location was conducted with the Main Campus EC team utilizing a simulated patient and parent. Our goal was to identify potential latent safety threats before the MPERT activation and Go-Live. 27 issues were identified.</p>

Failure Mode and Effects Analysis Worksheet

Project Leader(s): Julia Lawrence, Jeannie Eggers, Nichole Davis, Cara Doughty

Operational Leader: Tarra Kerr

Project Aim/Goal: Identify latent safety threats related to preparedness of MPERT prior to activation

Targeted Units/Departments: Main Campus MPERT

Resources, facilities, processes, and/or personnel to be examined: all

FMEA Scoring Tool:

Risk Priority Number (RPN) is calculated by multiplying **Severity** score by **Probability** score. Issues are considered significant priorities if **RPN** is between 8-16 on the scale of 1-16.

	4 - Catastrophic	3 - Major	2 - Moderate	1 - Minor
Severity of Categories	<p><i>Failure could cause death, injury</i></p> <p><u>Patient Outcome:</u></p> <ul style="list-style-type: none"> Death or major permanent loss of function (sensory, motor, physiologic, or intellectual) <p><u>Visitor Outcome:</u></p> <ul style="list-style-type: none"> A death; or hospitalization of ≥ 3 <p><u>Staff Outcome:</u></p> <ul style="list-style-type: none"> A death; or hospitalization of ≥ 3 <p><u>Equipment/Facility damage:</u></p> <p>Fire beyond the incipient stage; or damages $\geq \\$250,000$</p>	<p><i>Failure could cause high degree customer dissatisfaction</i></p> <p><u>Patient Outcome:</u></p> <ul style="list-style-type: none"> Permanent lessening of bodily functioning (sensory, motor, physiologic, or intellectual); or Increased length of stay or increased level of care for ≥ 3 patients <p><u>Visitor Outcome:</u></p> <ul style="list-style-type: none"> Hospitalization of 1-2 visitors <p><u>Staff Outcome:</u></p> <ul style="list-style-type: none"> Hospitalization of 1-2 staff; or ≥ 3 staff experiencing lost time, or restricted duty <p><u>Equipment/Facility damage:</u></p> <ul style="list-style-type: none"> Damages \$100,000-\$250,000 	<p><i>Failure can be overcome, but there is a minor performance loss</i></p> <p><u>Patient Outcome:</u></p> <ul style="list-style-type: none"> Increased length of stay or increased level of care for 1-2 patients <p><u>Visitor Outcome:</u></p> <ul style="list-style-type: none"> Evaluation, treatment of 1-2 visitors <p><u>Staff Outcome:</u></p> <ul style="list-style-type: none"> Medical expenses, lost time, or restricted duty for 1-2 staff <p><u>Equipment/Facility damage:</u></p> <ul style="list-style-type: none"> Damages \$10,000-\$100,000; or Fire, at/smaller than incipient stage 	<p><i>Failure not noticeable to customer, no effect on the delivery of service</i></p> <p><u>Patient Outcome:</u></p> <ul style="list-style-type: none"> No injury, nor increased length of stay, nor increased level of care <p><u>Visitor Outcome:</u></p> <ul style="list-style-type: none"> Evaluated, but no treatment <p><u>Staff Outcome:</u></p> <ul style="list-style-type: none"> First aid only, no lost time, or restricted duty <p><u>Equipment/Facility damage:</u></p> <ul style="list-style-type: none"> Damages $< \\$10,000$; or Loss of utility without an adverse patient outcome
Probability Ratings	Frequent	Occasional	Uncommon	Remote
	<i>Likely to occur immediately or within a short period (may happen several times in 1 year)</i>	<i>Probably will occur (may happen several times in 1 to 2 years)</i>	<i>Possible to occur (may happen sometime in 2 to 5 years)</i>	<i>Unlikely to occur (may happen sometime in 5 to 30 years)</i>

Outcomes and Results

I. Table 1: Potential Latent Safety Threats Identified with FMEA Hazard Scores (RED=Very High Priority 12-16; YELLOW=High Priority 8-11)

Item #	Potential LSTs Identified During Debriefings By Participants and Observers	Severity of Effect	Probability for Occurrence	Risk Priority Number	Possible Solutions Identified During Debriefings By Participants and Observers
1	<p>Registration folder:</p> <ul style="list-style-type: none"> • Can there be folders that contain all the information and questionnaires needed for registration? • It can also be preloaded with Covid-19 information sheets. • Unsure of consent form <ul style="list-style-type: none"> ○ If new patient, they would need total consent form. ○ If returning patient, they would be able to print existing form. • They can insert arm band and labels after printing. <ul style="list-style-type: none"> ○ Staff could take out what they need in the patient care area. • It would help to keep everything together. • Folder would go home with the parent. 	2	4	8	
2	<p>Where will equipment be located?</p> <ul style="list-style-type: none"> • Dynamap • Scales (infant and standing) • Otoscope/ophthalmoscope 	1	4	4	Will be moved from main EC when MPERT is activated.
3	<p>PPE storage: If they will be changing PPE between each patient, then they will need storage space and trash cans outside each room.</p>	2	4	8	
4	<p>Supplies storage:</p> <ul style="list-style-type: none"> • Can we keep supplies closer to patient care rooms? • Premade packs that we can take into the room. <ul style="list-style-type: none"> ○ Would need to be restocked between patients. 	2	4	8	

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	<ul style="list-style-type: none"> ○ Infection control issues: if inside the room, it would be considered dirty. ● Have supply cart outside the room: <ul style="list-style-type: none"> ○ Store swabs, tongue depressors, otoscope covers, red bags, urine cups. 				
5	<p>Suction: There is no way to suction patients in MPERT.</p>	3	2	6	<ul style="list-style-type: none"> ● Patients who need suctioning should not be going to MPERT. ● They would send patient to EC.
6	<p>Tech:</p> <ul style="list-style-type: none"> ● Concern with only having 1 tech. ● They may need additional help to hold patients during procedures/testing. 	2	3	6	2 nd RN or MD can help hold.
7	<p>AVS printer: Where does AVS print?</p>	1	4	4	Best location would be in the back by checkout desk.
8	<p>Runner:</p> <ul style="list-style-type: none"> ● Who is filling the role? ● If they are sending off labs, they will be going in and out of the space. Therefore, their PPE needs may be different. 	2	4	8	
9	<p>Registration line/wait:</p> <ul style="list-style-type: none"> ● Do they stop at triage before going to the waiting area or do they go to the waiting area first? ● What if there is a line of people at registration? <ul style="list-style-type: none"> ○ Is there a certain number of people that would trigger them to send to waiting area first? ○ How do they get them to the waiting area? <ul style="list-style-type: none"> ▪ Unsure if able to get there directly or if they will have to walk around triage. 	2	4	8	<ul style="list-style-type: none"> ● Ideal flow would be registration first, triage second, and the waiting area last. ● They could use a runner to take patient to the waiting area. ● They could move registration table to ensure a pathway to the waiting area.

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10	Assessments: Does the nurse and provider go in the room together?	1	4	4	May depend on the team, patient volume, flow, PPE requirements, etc.
11	WOW: Would like a WOW set up in the supply area in order to look up information (i.e. medications).	2	3	6	
12	Nasal swab testing: <ul style="list-style-type: none"> If the nurse and provider are going in together, who is performing the swab? Does the nurse perform the swab while the provider finishes their discussion with the parent? <ul style="list-style-type: none"> Parent may be distracted or trying to console patient. Do you bring supplies in the room for every patient that might need testing so you don't have to leave the room to get them? 	1	4	4	
13	Stethoscopes: Are they using a new one for each patient or cleaning in between?	2	4	8	
14	Discharge process: <ul style="list-style-type: none"> Patient to be moved to sub-waiting area while waiting for lab results. Do they give results and instructions there? <ul style="list-style-type: none"> Lab results Discharge instructions/AVS 	2	4	8	<ul style="list-style-type: none"> The providers should give parents anticipatory instructions in the room. If results are positive, do this. If results are negative, do this. Need to include in provider training. If additional conversations are needed, then can bring patient and parent back to the room.
15	Completing registration: <ul style="list-style-type: none"> AVS can't be printed until registration is complete. Are they sending patient to registration and then to wait in the subwait area? 	1	4	4	

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	<ul style="list-style-type: none"> Registrar would normally be able to go into the room to complete registration process. <ul style="list-style-type: none"> What kind of PPE will they be in? 				
16	Cleaning stretchers: Who will clean the stretchers between each patient?	1	4	4	<ul style="list-style-type: none"> There will be paper rolls to cover the stretcher. RN to caviwipe between patients.
17	If the patient needs to go back to the EC, what pathway do they use to get there?	2	3	6	
18	Crowd control: <ul style="list-style-type: none"> Are we regulating how many people can come into the MPERT area? Is this something security or labor pool can help with? 	2	3	6	
19	Triage area: <ul style="list-style-type: none"> Unsure whether to have parent/patient to sit down or stand. <ul style="list-style-type: none"> It would be difficult to do vital signs while patient is standing or while parent holds the child while standing. So they need a chair to sit in. Chairs are on the opposite side of the table from where the parent/patient would walk up. Do we need a table there or just chairs? 	2	4	8	<ul style="list-style-type: none"> Suggest moving chairs to other side of the table by the walkway. If keep table, then separate from registration tables to make it easier to walk parent/patient around.
20	Registration paperwork: <ul style="list-style-type: none"> Where will the parent fill out the forms? Can the registrar help fill out the paperwork? Can they do verbal consent? The registration table is low, which may be difficult for parents to write on. <ul style="list-style-type: none"> Can we add a chair? It is difficult for the parent to fill out the paperwork in the waiting area, especially if they are holding an infant. 	2	4	8	

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	<ul style="list-style-type: none"> If there is a stretcher in the patient care area, then they are able to set the child on the stretcher to complete the paperwork. 				
21	<p>Chair setup:</p> <ul style="list-style-type: none"> Chairs are close together, so how would we ensure social distancing? <ul style="list-style-type: none"> May depend on PPE decisions. All parents and patients would have on a mask. 	2	4	8	
22	<p>Lab printer:</p> <ul style="list-style-type: none"> Current location of the POCT area is far away. <ul style="list-style-type: none"> Can it be moved closer to the supply area? Can the lab printer be placed on the WOW? 	2	4	8	
23	<p>Signage:</p> <ul style="list-style-type: none"> Need to add signage for the following: <ul style="list-style-type: none"> Mark the exit, waiting areas, patient rooms, etc. Cover the "one-way" signs Arrows for wayfinding Social distancing Can they paint the entrance and exit doors different colors for wayfinding? 	3	4	12	
24	<p>Room walls:</p> <p>Behind the columns there are not patient room walls, so you can see the other patients.</p>	3	4	12	
25	<p>Noise level:</p> <ul style="list-style-type: none"> It is loud in the space and there is an echo. Need to be mindful of patient privacy. 	3	4	12	
26	Can the parking garage arm be removed?	2	4	8	
27	<p>Exit:</p> <ul style="list-style-type: none"> Parents may need help with wayfinding once they exit. <ul style="list-style-type: none"> Can there be someone there to direct them where to go? Concerns about safety of exit. 	3	4	12	

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	<ul style="list-style-type: none"> ○ The exit opens up to the driveway. ○ There is no cross walk right there. ○ Can they block it so families can't walk across the driveway and have to walk down towards the crosswalk? 				
	None				

High Priority Themes:

- Crowd control –accommodating an increase influx of patients
- Wayfinding – signage within the space and upon exiting
- Re-arranging the areas within MPERT for a better flow – triage and registration setup, POCT location, additional supplies closer to the patient rooms
- PPE process- still under discussion