

## INTRODUCTION

Latent safety threats (LSTs) are system-based threats to patient safety. In-situ simulation provides a safe environment to identify LSTs and an opportunity to mitigate these threats and improve patient safety<sup>1</sup>. Covid-19 has led to many changes in perioperative systems, environments, staffing, protocols and guidelines. In-situ simulation can test these innovations.

Threat and error management is a widely used technique in aviation<sup>2</sup>. Human factors feedback delivered by airline pilots can provide unique insights and help facilitate change in our systems to improve patient safety.

## METHODS

Anaesthetic multidisciplinary in-situ simulation is carried out fortnightly in our district general hospital. Furloughed airline pilots provide respected human factors feedback.



LSTs are formally documented and escalated via the critical incident reporting system; they are filed under 'simulation' to allow appropriate incident response and to keep clear records for the project. Incidents are categorised as 'near miss' patient safety incidents, and reported externally via the National Reporting and Learning System (NRLS) to help capture national themes and trends. The Trust quality governance lead ensures action is taken to resolve each threat.

An anonymised technical and human factors debrief, including relevant LSTs and actions taken, is disseminated to the department after each simulation to enhance learning. Scenarios have been developed based on previous critical incidents and recurrent themes are tested in repeated simulations.

## RESULTS

Sixteen anaesthetic multidisciplinary in-situ simulations have taken place between August 2020 to February 2021 and approximately 1-3 LSTs have been identified from each simulation.

Scenario	LST identified	Action to improve patient safety
<b>Drug overdose with airway compromise</b>	• "Fast bleed to anaesthetist" does not alert ODP	• Disseminated to ED staff regarding need to put out 2222 call
	• Adult and paediatric anaesthetic airway trays very similar appearance	• Improved colouring and labelling of airway trays
<b>Trauma call</b>	• Chest drain kit – wrong type of chest drain present	• Availability of correct chest drain equipment and awareness
	• Major haemorrhage protocol requires porter separately	• Teaching and revision of protocol
	• No crash ODP available	• Staffing issues escalated and placed on risk register, training discussed
<b>Covid-19 intubation</b>	• Intubation checklist not used	• Checklist laminated and disseminated
	• Unsure where to find capnography in ED	• Location confirmed and added to anaesthetic equipment box
	• Difficult communication in PPE	• Walkie talkies for communication and creation of aviation technique video
<b>Transfer to new surgical ward</b>	• Emergency buzzer not working	• Emergency buzzer fixed and added to daily checks
<b>Laryngospasm</b>	• Location of paediatric crash trolleys for paediatrics	• Information disseminated about location of manual defib for paediatrics
<b>Can't intubate can't oxygenate</b>	• Unsure where to find emergency front of neck access kit in ED	• Location clarified and disseminated, label added to crash trolley
<b>Obstetric failed intubation</b>	• New staff unsure of difficult airway trolley location on labour ward	• Location clarified and disseminated amongst new trainees including at induction

Table 1: Examples of latent safety threats identified, and action taken to improve safety.



Figure 1. Faulty emergency buzzer.



Figure 2. New labelling of front of neck access trolley in Emergency Department.



## CONCLUSION

- LST identification and mitigation through in-situ simulation has improved perioperative safety.
- Involvement of airline pilots has been invaluable to boost awareness and infrastructure of in-situ simulation, and by enabling us to learn from their approach to threat and error management.
- The value of in-situ simulation for training and patient safety during the Covid-19 pandemic is highlighted.

## References

1. Patterson MD, Geis GL, Falcone RA, LeMaster T, Wears RL. In situ simulation: detection of safety threats and teamwork training in a high risk emergency department. *BMJ Qual Saf.* 2013;22(6):468-77.
2. Ruskin KJ, Stiegler MP, Park K, Guffey P, Kurup V, Chidester T. Threat and error management for anesthesiologists: a predictive risk taxonomy. *Curr Opin Anaesthesiol.* 2013;26(6):707-713.