

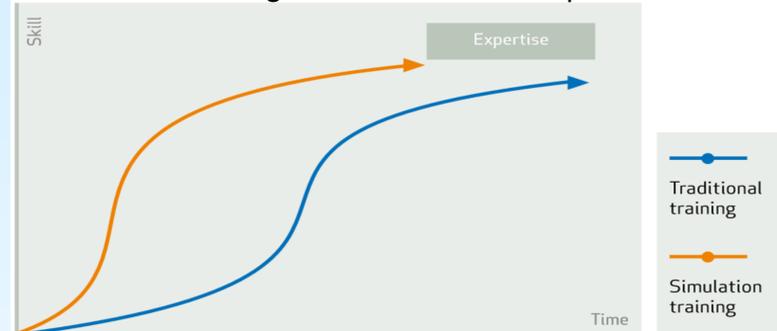
In situ simulation detects serious latent errors on the labour ward

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Introduction

Training in anaesthesia relies on the duration and quality of clinical experience. This works well in routine cases but less so when an uncommon life-threatening event occurs. Simulation offers a chance to rehearse these uncommon scenarios.(1) Thus it also offers the potential to accelerate the learning curve within training.(2)

Simulation training accelerates the acquisition of skills



Source: see reference 2

In situ simulation has evolved as a particular form of simulation, distinct from simulation that is conducted in a simulation centre. In situ simulation may be defined as “Simulations that occur in the actual clinical environment and whose participants are on-duty clinical providers during their actual workday.” In situ simulation improves teamwork (3) and identifies latent errors and performance gaps in managing obstetric patients.(3,4,5,6) We present our experience of in situ simulation on the labour ward of a busy teaching hospital.

Methods

Unannounced simulated emergency drills using manikins were run monthly on our labour ward since August 2014. Our scenarios were based on sepsis, local anaesthetic toxicity, pre-eclampsia/eclampsia and amniotic fluid embolism and all involved maternal cardiac arrest. We replaced the equipment in the clinical area with reusable equipment used only for simulations. For example, our cardiac arrest trolley was stocked exactly like those used in the labour ward. All such equipment was removed after the simulation. For each drill one technician videotaped, one ran the equipment and the session trainer observed and facilitated the session. The ancillary equipment and operators were shielded from the participants.

Midwives, obstetricians and anaesthetists on duty attended the drill which was videotaped and replayed during debriefing. Resuscitation skills, human factor approach and theoretical knowledge were critiqued. The session trainer completed a latent risk form following each exercise which identified the risk, categorised it and assigned a risk score using the National Patient Safety Agency (NPSA) risk analysis model(7) with details of the action taken.

NPSA Risk Matrix Scoring (Consequence x Likelihood)

Likelihood score	Likelihood				
	1	2	3	4	5
	Rare	Unlikely	Possible	Likely	Almost certain
5 Catastrophic	5	10	15	20	25
4 Major	4	8	12	16	20
3 Moderate	3	6	9	12	15
2 Minor	2	4	6	8	10
1 Negligible	1	2	3	4	5

1 - 3 Low risk
 4 - 6 Moderate risk
 8 - 12 High risk
 15 - 25 Extreme risk

Source: see reference 7

Results

Risk Identified	Category	Risk Score	Action Taken
No magnesium sulphate	Medication	20	Inform theatre coordinator
Perimortem caesarean section (CS) pack unavailable	Equipment	4	Inform labour ward midwife practitioner
Resuscitation trolley misplaced	Equipment	4	Inform obstetric consultant and midwife lead
Syringe drivers unavailable	Equipment	9	Inform Operating Department Practitioner (ODP) lead
Location of crash trolley not known	Training	9	Feedback to them and inform ward manager
Location where perimortem CS should be performed not known	Training	9	Feedback to them and inform ward manager
Maternal resuscitation algorithm knowledge	Training	4	Inform obstetric consultant and midwife lead
Location of Intralipid not known	Training	20	Inform labour ward and anaesthetics clinical leads

Discussion

Our in situ programme revealed persistent failure of teams to conduct a perimortem caesarean section (CS) within acceptable time frames, misplaced or unavailable vital equipment and missing drugs on our labour ward. A ready-to-use CS pack on all trolleys including in the accident and emergency department, immediate pharmacy input, urgent equipment replacement and complete overhaul of labour ward drug storage was instituted. Conventionally drills are used to refresh staff knowledge. Senior management 'buy in' and we believe our unique use of simulation as an environmental surveillance tool can reduce litigation costs and increase management support for educational activities. We recommend that in situ drills should be used by all units to identify and tackle latent risks to make the environment safer for patients.

References

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Summary

- In situ simulation has evolved as a particular form of simulation, distinct from simulation that is conducted in a simulation centre.
- Unannounced simulated emergency drills using manikins were run monthly on our labour ward since August 2014.
- These were based on sepsis, LA toxicity, pre-eclampsia/eclampsia and amniotic fluid embolism and all involved maternal cardiac arrest.
- They revealed failure of teams to conduct timely perimortem CS, misplaced or unavailable vital equipment and missing drugs.
- The latent risks identified were categorised and assigned a risk score using the NPSA risk analysis model, and appropriate action was taken.