Improving patient safety and outcomes in the Leeds Neonatal Service – the role of the simulation training programme

infant
PATIENT SAFETY
Working together

Hannah Shore Consultant in Neonatal Medicine, Neonatal Unit, Leeds Children's Hospital
hannah.shore@leedsth.nhs.uk

Simulation offers the opportunity to anticipate and prepare for problems in high risk events. Since August 2011 the Leeds Neonatal Service has had an active simulation training programme, contributing to improving patient safety and outcomes in a range of innovative ways. Incidents are reviewed as part of the governance process and many of these are used to form the basis of future training and/or simulated scenarios. Five key areas are considered:

1. Junior doctor induction

The great challenge with the change of neonatal unit staff in February and August, is how to efficiently train team members to function effectively in the first few days and weeks of the post.

In Leeds, two afternoon sessions of 'skills and drills' are run on day 1 and 3 of the post, including basic resuscitation skills, use of emergency equipment, resuscitation equipment bags, insertion of cannulae, aseptic access of central lines, etc (**FIGURE 1**). These are followed by two sessions of commonly encountered scenarios in the second week of induction: the first considers a term infant born with cardiorespiratory depression at birth, the second, delivery of an extreme preterm infant (**FIGURE 2**).

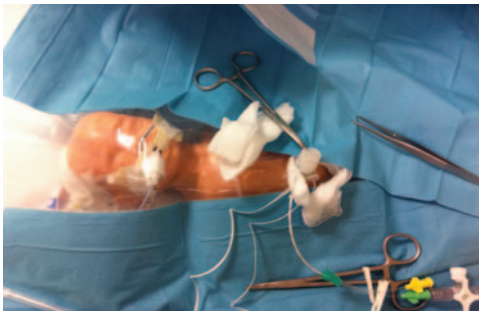

FIGURE 1 'Skills and drills', practising umbilical venous catheter insertion on a training manikin.

These training scenarios highlight the important treatment points that all junior staff need to understand from the start of their neonatal roles and introduce the Trust guidelines in a practical way.

2. Nursing mandatory training days

A key part of neonatal care is skin-to-skin, 'kangaroo' care and staff in Leeds are aiming to safely implement this with smaller and more preterm infants. This is not without risk as many of the infants are receiving continuous positive airway pressure or high flow therapy and/or have umbilical or PICC lines (peripherally inserted central catheter) *in situ*.

The incident reporting system in Leeds had revealed a range of problems associated with caring for lines while parents were carrying out the important task of kangaroo care, and highlighted the need to improve training for nursing staff in handling infants with lines.

Local nursing mandatory training has always included kangaroo care but now training is delivered using manikins –

FIGURE 2 A 'premature manikin' linked to a ventilator for training purposes.

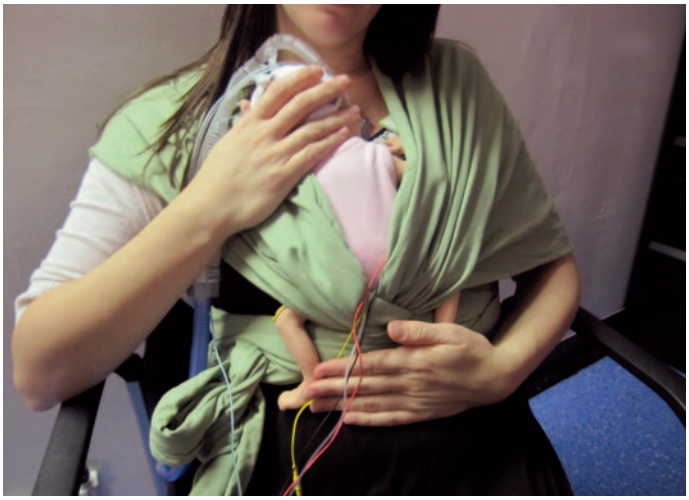

FIGURE 3 Simulating the complexities of kangaroo care with a training manikin.

FIGURE 4 Simulating the initial resuscitation of conjoined twins.

the Nita Newborn and Life/Form Micro-Preemie Simulator, which have lines in place, to allow the training to focus on the practical elements of delivering skin-to-skin care to these complex infants (**FIGURE 3**).

Anecdotally, it appears that rehearsing this technique in a low risk environment results in fewer incidents relating to lines and increases staff confidence in handling these infants so that kangaroo care can be safely and effectively delivered.

3. Guideline implementation

The implementation of, and adherence to, guidelines is a key part of patient safety and improving outcomes. Recently the Leeds Neonatal Service significantly changed its ventilation guideline and acquired new ventilators. A range of simulated scenarios were run in order to familiarise multidisciplinary staff with all aspects of the guidelines and new equipment.

This exercise greatly increased confidence in using the equipment (eg changing settings and ventilator modes) with the added bonus that staff were more enthusiastic to accept such a significant change to practice.

4. Pre-briefing for anticipated events

As previously reported in *Infant*, there was potential for delivery of conjoined twins within the Leeds region.[1] This represented a 'low incidence-high risk' event for which a meticulous simulation was performed so that a detailed plan looking at equipment, multidisciplinary staffing issues and medical management was in place before the incident occurred (**FIGURE 4**).

It is envisaged that preplanning for anticipated events will be taken further in the future, eg preparing an infant with hypoplastic left heart for transfer.

5. Collating latent risks and feeding into the governance process

In Leeds, multi-professional *in situ* training is delivered within the neonatal units at least once a month. This improves team working, communication, familiarisation with equipment and permits testing of processes in a safe and repeatable way. In this way, problems have been identified with the equipment, environment or staffing, deemed latent risks or 'accidents waiting to happen'.

For example, it became evident that it was completely impractical in this setting to transfer infants from the labour ward to the neonatal unit in a transport incubator, as stipulated in the local guideline. Therefore, a change was made to transfer infants on the resuscitation platform and strategies to maintain thermoregulation were initiated. In another scenario, it was established that the emergency bags that were in use, were not fit for purpose. Consequently, they were completely redesigned, making it easier to find the equipment in an emergency.

Simulation offers the opportunity to identify these unanticipated latent risks, which can then be worked on using risk management techniques to ensure that they never manifest as actual adverse events. When issues are discovered through training exercises, they are documented, discussed at governance meetings and fed into the education programme.

References

1. **Howard C., Shore H., Talbot H. et al.** Preparing for a low incidence-high risk event with conjoined twins. *Infant* 2014;10:95-96.