NICU handovers – are we doing them right? Lessons from an audit

Clinical handover is a complex area of medicine that is increasingly recognised as a situation where advanced communication is essential to ensure patient safety. The current practice of handovers in a tertiary neonatal intensive care unit (NICU) was evaluated. Data was collected using a questionnaire; following implementation of the recommendations from the audit, a re-audit performed after two months showed a significant improvement in almost all standards of the handover. It is hoped that other units adopt a similar approach towards their handovers.

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Keywords

handover; neonatal; efficiency; guidelines

Key points

Mubashar Y., Kariholu U. NICU handovers – are we doing them right? Lessons from an audit. *Infant* 2016; 12(3): 101-104.

1. The practice of medical handovers at a regional level 3 NICU was evaluated.
2. The quality and efficiency of handovers in the NICU setting can be improved with the use of a structured and systematic approach.

Background

The clinical handover is a system by which the responsibility for immediate and ongoing care is transferred between healthcare professionals.[1] It is a complex area of advanced communication in medicine that is recognised as a situation where good communication is needed to ensure patient safety.[2]

August 2009 saw the full implementation of the European working time directive (EWTD) into UK legislation. For junior doctors, the EWTD limits workers to a maximum of 48 hours per week, averaged over a six-month period, and lays down minimum requirements in relation to working hours, rest periods and annual leave.[3,4] The directive resulted in new challenges for UK training programmes; one such challenge is the dramatic increase in the number of handovers. As a result, it is important to develop strategies to optimise the patient handover process in order to improve patient care. Similar experiences have been reported in other countries, such as the US.[5] The Royal College of Surgeons has produced guidelines on safe handover practice in which a minimum dataset is recommended for inclusion when handing over patients to incoming surgical teams; studies have indicated better adherence to these guidelines when pre-printed handover *pro formas* are used.[6]

In recent literature there is awareness that effective patient handover is critical for patient safety by ensuring appropriate coordination among healthcare providers and continuity of care. It has been repeatedly noted that lack of training and formal systems for patient handover impedes the good practice necessary for maintaining high standards of clinical care. Thus, patient handover has been defined as a research priority for patient safety.[7-9]

Despite being essential to patient care, current clinical handover practices are inconsistent and error prone.[10] Various methods have been tried and adopted to improve and standardise the handover process and teach effective handover techniques to various healthcare professionals. These include the use of the SBAR (situation-background-assessment-recommendation) tool,[10] a specialised handover toolbox that was designed in the context of the European HANDOVER Project,[11] and the use of simulation to teach student nurses effective handover techniques.[12] The SBAR handover technique breaks down information for handover into:

- Situation – reason for admission, active problems, concerns
- Background – relevant points in medical history, before admission, since admission (progress, procedures)
- Assessment – assessment of clinical progress/deterioration, assessment of blood analyses/tests
- Recommendation – outstanding tasks, further care planning.

In 2005, the Royal College of Paediatrics and Child Health (RCPCH) produced the document *Safe Handover: Safe Patients,*[13]

which provides guidelines on improving the standards of handovers. The detailed strategy for handover laid out in this document states that the handover should be supervised by the most senior clinician. The guidelines recommend that all grades of staff from all wards – advanced neonatal nurse practitioners (ANNPs), the senior nurse and a senior clinician (preferably consultant) – should be present at a handover. The document also clearly asserts what should be handed over to the next team, in which order and the ideal location for the handover to take place. Other key recommendations from this document are summarised in **TABLE 1**.

A handover technique, which includes breaking down information for handover into SBAR format, that was first used by the US navy,[14] is now recommended by the Royal College of Physicians (RCP),[1] RCPCH[13] and the National Clinical Effectiveness Committee Ireland.[15]

Handovers should take place in a large room close to the ward to allow everyone to attend
There should be access to laboratory results, X-rays and a telephone
The handover room should not be used by other professionals for other purposes at those times
There should be a predetermined format and structure to ensure adequate information is exchanged
An electronic record and work book should be kept of all handovers to monitor progress of outstanding tasks, which should be reviewed at the next handover. This would avoid repetition of the same information and save time
The team leader should distribute tasks according to individual competencies
Every effort should be made to maintain handover start and finish times, hence the handovers should take place at fixed times and be of sufficient length at each change of shift. During these times a bleep-free period is maintained, except emergencies. Attendance at handover should take priority except during emergencies
Staff shifts should be aligned to include time for handover within all working shift times
Handover should include outstanding tasks together with the management plans linked to results of the patients and information on relevant children at home or on other wards, eg postnatal wards
The sequence for handing over patients should include clinically unstable children first. Also, the handing over team should ensure all acutely unwell and at-risk patients, including child protection cases, are known to the senior members of the team
The handover sheets should include a complete up-to-date list of patients and their whereabouts, names of accepted and referred patients due to be assessed, information given to parents/carers, operational matters, eg bed availability, patients with anticipated problems with their management plans and times for review

TABLE 1 A summary of the key recommendations from the RCPCH document *Safe Handover: Safe Patients*.[13]

Aims and methodology

With the above mentioned guidelines in mind, the current practice of medical handover at the regional level 3 NICU in Derriford Hospital, Plymouth, was evaluated to determine if 100% compliance with the standards set out in *RCPCH Good Practice in Handover*[13] document is achieved.

Data were collected for 25 handovers between 30 April 2015 and 27 May 2015 including a weekend, via a questionnaire developed from *RCPCH Good Practice in Handovers*[13] (**TABLE 2**). The recommendations that came out of the audit were implemented and after two months a re-audit was performed. This time data were collected for 27 handovers between 23 July 2015 and 21 August 2015.

Results

The results of the first audit

The results of the first audit were generally positive (**TABLE 2**). The quality of NICU handovers was good with minimal interruptions. There was consultant/senior medical staff presence in all handovers. Areas for improvement were:

- time keeping within the pre-agreed time for handover of 45 minutes (60%)
- the presence of a senior nurse (56%).

Similarly staff briefing was generally found to be good within all areas of the NICU, high dependency unit (HDU), special care baby unit (SCBU) and transitional care ward (TCW) (patients and tasks handover, 100%).

Areas for improvement were:

- discussion of high risk deliveries (72%)
- safeguarding concerns (8%)
- concerns regarding parents (32%).

It was found that handover regarding ward management was generally poor. Staffing issues (medical and nursing) were each discussed only 8% of the time, bed availability 12% and expected community referrals just 4% of the time.

After analysing the results of the audit, recommendations for adopting the questionnaire template for handovers were made, with the plan to re-audit after eight weeks of its use. The handover briefing checklist was displayed in the handover room (**FIGURE 1**).

Results of the re-audit

The results of the re-audit (**TABLE 2**) showed a significant improvement in all standards except handover time (60% pre *vs* 74% post) and interruptions (8% pre *vs* 15% post). The re-audit confirmed improvement in handover practices, particularly in the areas of:

- time efficiency (ensuring all vital information is passed on)
- discussion of high risk deliveries
- safeguarding concerns
- concerns regarding parents
- medical and nursing staffing issues
- bed availability issues
- anticipated community referrals.

The re-audit confirmed that most of the standards derived from the RCPCH guidance[13] had improved to 100%. Only one standard, related to handover time management, had improved but did not achieve 100% compliance.

The final recommendations from the re-audit included:

- continue displaying the handover briefing checklist in the handover room
- maintain using the SBAR template for medical handovers
- re-audit after six months.

Discussion

The clinical handover of critically ill patients in the NICU is a dynamic and complex process that can lead to

communication and technical errors. Apart from an article from Brown et al,[16] a literature search did not reveal any articles that assessed or improved upon neonatal handovers. In the RCP handover survey[1] it was found that handover most commonly takes place between consultants and their junior teams once or twice within 24 hours (69% and 66%, respectively) and between teams of juniors three or more times within 24 hours (27%).[1]

The expectation would be for a designated consultant and nurse to coordinate the multidisciplinary team. At challenging times, eg nights, weekends or during an emergency admission, the responsibility for care must pass from one team or consultant to another. It remains the ultimate responsibility of doctors to ensure that their patients are safe, diagnosed efficiently and treated effectively.[1] Active consultant participation in handover is uncommon (acute care handover 34%, service handover 32%, hospital-wide handover 9%).[17]

In this audit, it was found that a consultant/senior clinician/ANNP was present 100% of the time. Over a typical weekend up to five handovers can take place between different teams; the quality of handover is affected by the way it is recorded and transferred to the next team. Bhabra et al[18] found that in verbal handovers only 2.5% of information from the first handover is retained at the final handover, increasing to 85.5% if notes are taken. This figure rises to 99% when a standardised *pro forma* is used. Improvement and standardisation of handover are vital keys to improvement in efficiency, patient safety and patient experience.[1]

Question (yes/no)	First audit Total	First audit Yes (%)	First audit No (%)	Re-audit Total	Re-audit Yes (%)	Re-audit No (%)
Quality						
Was the handover time as per rota?‡	25	15 (60)	10 (40)	27	20 (74)	7 (26)
Presence of outgoing senior doctor/ANNP?	25	25 (100)	0	27	27 (100)	
Presence of incoming senior doctor/ANNP?	25	25 (100)	0	27	27 (100)	
Presence of in-charge nurse?	25	14 (56)	11 (44)	16*	16 (100)	
Were there any interruptions?	25	2 (8)	23 (92)	27	4 (15)	23 (85)
Staff briefing						
Patients in NICU handed over?	25	25 (100)	0	27	27 (100)	
Patients in HDU handed over?	25	25 (100)	0	27	27 (100)	
Patients in SCBU handed over?	25	25 (100)	0	27	27 (100)	
TCW tasks handed over?	25	25 (100)	0	27	27 (100)	
High risk deliveries discussed?	25	18 (72)	7 (28)	27	27 (100)	
Safeguarding concerns discussed?	25	2 (8)	23 (92)	27	27 (100)	
Parental concerns discussed?	25	8 (32)	17 (68)	27	27 (100)	
Ward management						
Medical staffing issues discussed?	25	2 (8)	23 (92)	27	27 (100)	
Nursing staffing issues discussed?	25	2 (8)	23 (92)	27	27 (100)	
Bed status/availability discussed?	25	3 (12)	22 (88)	27	27 (100)	
Expected community referrals discussed?	25	1 (4)	24 (96)	27	27 (100)	

TABLE 2 The results of the two audits. *The in-charge nurse could not attend all handovers due to prior commitments hence the total number of handovers where the nurse was expected was less than the total number of handovers. This is taken into account in the analysis. ‡The handover time was previously agreed to be ≤45 minutes. This was an arbitrary time limit agreed by the clinical teams, which reflected the average number of patients while ensuring time for all vital information to be passed on. Key: ANNP = advanced neonatal nurse practitioner, NICU = neonatal intensive care unit, HDU = high dependency unit, SCBU = special care baby unit, TCW = transitional care ward.

The Derriford Hospital evaluation of NICU handovers comprised an audit cycle whereby an intervention was performed based on recommendations from the first audit, and the effects and change of practice were recorded in a re-audit. This approach was adopted as the implementation of recommendations from the original audit was immediate and there was a definite change in practice noted within two months.

The data from the original audit confirmed that a safety briefing was regularly left incomplete by not addressing the issues of high risk deliveries, safeguarding concerns and concerns regarding parents. In addition to this, ward management issues were frequently not discussed, including medical and nursing staffing issues, bed availability and expected community referrals. These findings are consistent with Bhabra et al's study,[18] which showed that the quality of verbal handovers is generally poor.

A systematic literature review[19] highlighted that 24 studies recommended structuring and standardising the handover process by the use of checklists and protocols and that these measures improved effectiveness, efficiency of handovers and perceived team work. The clear need for improvement in clinical handovers in Derriford NICU, as demonstrated by the original audit, was addressed by displaying a safety briefing checklist on the wall of the handover room (**FIGURE 1**).

Implementation of a handover bundle consisting of standardised communication and handover training with a verbal mnemonic has been associated with a significant reduction in medical errors and preventable adverse events among hospitalised children.[20] With such processes in place, improvements in verbal and written handover processes occurred, and resident workflow did not change adversely. Consistent with this study, the comparative data from the original Derriford audit and re-audit suggests that the safety briefing checklist, which was displayed in the handover room, improved the communication as well as facilitated smooth transition, without the risk of loss of any important information between the two clinical teams at the time of handover.

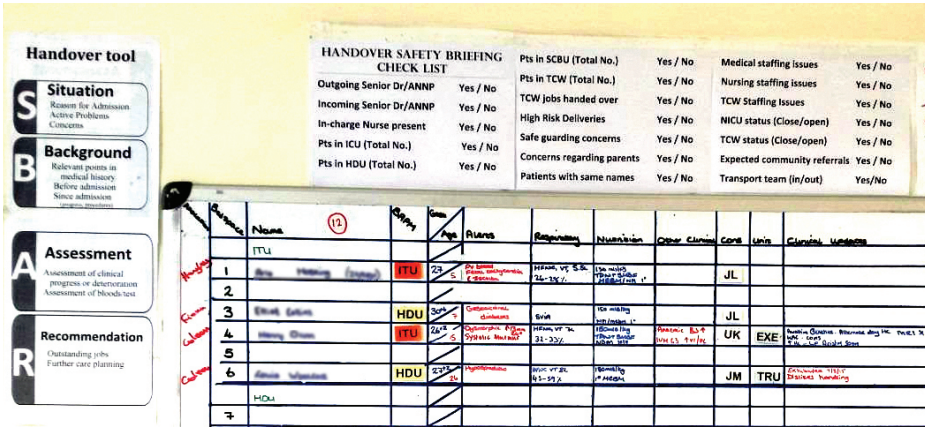

FIGURE 1 The handover briefing checklists, as displayed in the handover room.

Conclusion

Although the number of handover encounters captured within this audit was small (25 and 27 in the audit and re-audit respectively), the authors believe that the results are a true representation of usual practice. With the implementation of the audit's recommendations it was shown that, with the use of a structured and systematic approach, the quality and efficiency of handovers in an intensive care setting can be improved.

Acknowledgement

The authors would like to thank all staff working at Derriford Hospital NICU for their participation in the audit.

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