Neonatal cranial ultrasound: An audit of trainee opportunities and compliance

**SUMMARY**
- Neonatal cranial ultrasound scanning is an important tool on the neonatal unit.
- Specific guidelines and a dedicated proforma improve scanning compliance, documentation, management and work planning.
- Expert training improves trainee confidence in performing and interpreting scans, ultimately enhancing service provision and patient care.

**OBJECTIVES**
- To enhance trainee opportunities in performing and interpreting scans under expert supervision, ultimately leading to improved service provision and confident independent practice.
- To produce departmental guidelines citing clinical indications regarding the frequency and appropriateness of cranial ultrasound scanning.
- To improve documentation and planning of scans to improve time management.

**PART 1**

**Methods**
- Senior Paediatric Specialty Trainees (ST4 and above) questionnaires utilised to frame the context of audit.
- To assess trainees’ confidence in performing and interpreting (P&I) cranial ultrasound scans (CUS): number of scans performed with/without supervision and who supervised.
- P&I confidence level assessed on a modified Likert scale.
- 6 data interpretation questions to gauge ability to identify abnormalities, to decide immediate management and discuss prognosis.

**Results**
- n=43 (37%) of Paediatric ST responded.
  - Level 2 trainees (ST4-6, n=7) had performed <25 scans stating ‘little confidence’ with P&I.
  - Level 3 trainees (ST6-8, n=1) had performed 25-75 scans stating ‘confident’ with P&I.
- All stated supervision with Paediatric consultant; no senior Radiology input.
- All identified major abnormalities on picture questionnaire, sensible answers provided regarding management, however limited information regarding prognosis.

**Discussion**
- Majority of ST were at Level 2 and stated little confidence with P&I.
- These trainees see the majority Paediatric presence in hospital out of hours; they need to be able to perform scans whenever necessary to assess intracranial pathology and transfer before a higher care facility.
- Trainee opportunity and exposure to Paediatric CUS is needed to be increased to improve their confidence and skill base.

**Action Taken**
- Weekly teaching sessions on the unit with a consultant Radiologist experienced in cranial ultrasound; sessions are very well attended.
- Up-to-date CUS list now on neonatal unit for quick reference.
- New ultrasound scanner on unit able to store images with working plan to connect & upload to PACS to facilitate discussion at departmental & Radiology meetings.

**PART 2**

**CYCLE 1**

**Methods**
- Audit design and standards set.
- Daily data collection over 12-week consecutive period against standards.

**Standard Sources**
- North Trent Neonatal Network Cranial Ultrasound guidelines, October 2009.
- Vimal Vasu Cranial Ultrasound guidelines, Guy’s Hospital, September 2011.

**Discussion**
- Poor compliance, documentation and lack of follow up scans all result from no formal guidelines and dedicated proforma to document findings.
- Loose scans placed in clinical collection wallet with no data, time, comment or reference to scan result in notes or result not documented.
- Time wasted searching to see if scan done, when, by whom, indication, of what was corrected gestational age (CGA), whether it was reviewed by senior; scan documentation, any further action undertaken.
- Unusual and dangerous practice, potential for litigation.
- No logic applied to scanning, appears random and ad-hoc, usually done pre-discharge rather than based on clinical need.
- No baby had a Standard Electronic Neonatal Database (SEND) CUS form completed.

**Action Taken**
- Changes introduced to unit:
  - Comprehensive guidelines covering clinical indications for scanning based on CGA presented to the department and made available to all.
  - How to scan guide created for use with new ultrasound machine including practical points and discussions with parents.
  - ‘How to scan’ guide for every baby who is admitted to the unit prompting an assessment for indication for CUS, easily integrated into admission paperwork therefore in hospital extra work.
  - Highly visible seminar posters next to scanner and computers to remind users to document findings on proforma and update SEND after scan & plan for next scan.
  - Support from neonatal unit manager and nursing staff to be proactive and encourage trainees to perform CUS at mutually convenient times.

**Cycle 2**

**Methods**
- Second round of daily data collection over 12-week consecutive period.
- Data analysis.
- Assessment of changes.
- Data presentation with further recommendations.

**Standard Source**
- Newly implemented guidelines 6 months after presentation to department & approval for use.

**Discussion**
- Improved compliance rate, improving work planning and use of resources.
- Scans performed on new ultrasound machine can be stored on hard drive reducing unneeded loose scan print outs in the notes.
- Over half of babies in this cycle (n=15, 60%) had a proforma ensuring that an assessment regarding the indication and need for CUS was taken.
- Significantly improved documentation including name, signature and level of supervision when performing scan.
- Significant number of scans documented with plan for follow up scan, considerable improvement on the previous ‘patchy’ documentation in the medical notes.
- No baby had a Standard Electronic Neonatal Database (SEND) CUS form completed.
- However, trainees cited using proforma shortened time completing discharge summaries as scan information could be copied directly onto the system.

**Action Taken**
- Results presented to Paediatric department.
- Presentation for excellent progress made but encouraged to continue to improve routine assessments for CUS and electronic documentation at time of scan.

**CONCLUSION**
Cranial ultrasound scanning is an important tool on the neonatal unit. To enhance trainee confidence in performing and interpreting scans, a dedicated proforma improves confidence surrounding parental discussions regarding the indication and need for CUS. Ultimately this enhances service provision, allows for appropriate use of resources and improves patient care.

**FUTURE ACTION**
To standardise neonatal cranial ultrasound guidelines throughout the Neonatal Network to ensure and improve continuity of care for babies transferred within the network, both immediately and at two-year neurodevelopment follow up.