NCEPOD audit pack

National Confidential Enquiry into Patient Outcome and Death

Are We There Yet?

A review of organisational and clinical aspects of children's surgery

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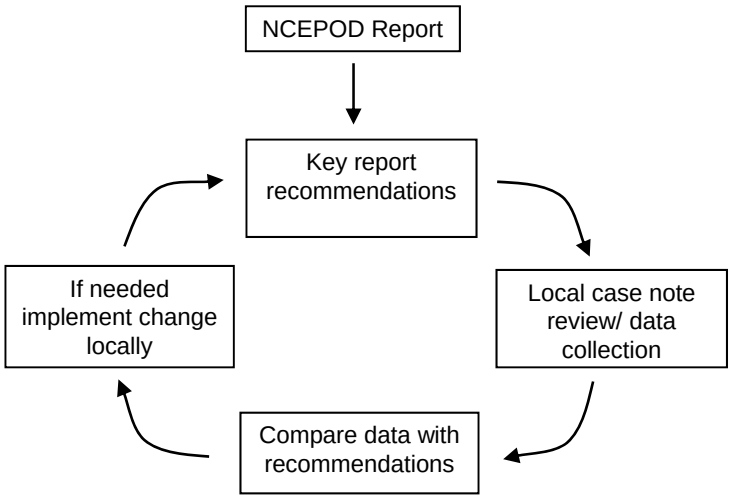
What is clinical audit?

The National Institute for Clinical Excellence (NICE) endorsed definition of clinical audit is: 'A quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Aspects of the structure, processes, and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated, changes are implemented at an individual, team, or service level and further monitoring is used to confirm improvement in healthcare delivery'. Please refer to the Health Quality Improvement Partnership (HQIP) www.hqip.org.uk for more details.

NCEPOD – "Improving the quality of medical and surgical care".
The overall aim of NCEPOD is to assist in maintaining and improving standards of medical and surgical care.

This is achieved by undertaking confidential questionnaire and peer review based studies, the findings of which are disseminated back to the medical profession and wider audience in the form of a report. Each NCEPOD report makes a number of key recommendations related to both clinical and organisational aspects of care. It is only when these recommendations are implemented that NCEPOD realises its function and overall aim.

The purpose of the NCEPOD audit pack is to provide clinicians with a tool to carry out local audits based on the findings of specific NCEPOD reports. Where appropriate report recommendations have been adapted to become more relevant to front line clinicians and case note review.



Introduction – Surgery in Children study

The delivery of surgical services for children in the United Kingdom has changed in the last 20 years. Since the first NCEPOD report about standards for the surgical and anaesthetic care of children[1] there have been a number of other documents with both direct and indirect effects on the totality of care for children in the health service including the National Service Framework for children[2]; the Healthcare Commission's 'Improving Services for Children in Hospital'[3]; the Every Child Matters programme[4]; the Children's Plan[5]; the NHS Next Stage Review[6]; the joint Department for Children Schools and Families/Department of Health[7] strategy for children and young people; Sir Ian Kennedy's report on children's services[8]; and a report by the Royal College of Paediatrics and Child Health[9]. As a result there has been both clinical and organisational change to health care provision for children. These include specialisation and centralisation of children's services, and modifications of staff training. There is direct evidence that there has been a reduction in the number of DGH's providing children's surgery. Even so the majority of operations are still undertaken in this setting[10].

Twenty-one years ago the first NCEPOD report which reviewed deaths in children within 30 days of surgery[1] showed that there were deficiencies in the skills of health care professionals who cared for surgical children and in the facilities available. This was thought to be especially so in District General and Single Specialty Hospitals.

Recommendations were made that surgeons and anaesthetists should not undertake occasional paediatric practice and that consultants who have responsibility for children need to maintain their competence in the management of children. The 1999 NCEPOD report, '*Extremes of Age',* recommended a regional approach to the organisation of paediatric surgical services[11]. These recommendations along with others have resulted in considerable debate on the best model for children's surgery in the UK both in terms of skills of health care professional and the appropriate facilities[12-14].

There has been a decline in the number of children who have surgery performed in District General Hospitals (DGHs) from more than 410,000 children under 18 years in 1994/1995 to 325,000 in 2004/2005. This is a complex situation and some of this reduction reflects changes in practice (e.g. general reduction in ear, nose and throat procedures). However, there has been an increase in referrals to tertiary centres, particularly in the areas of general and also orthopaedic surgery without any shift of resources[1].

Whilst in principle this may encourage greater paediatric specialisation and concentration of expertise there is a perception amongst some clinicians and anecdotal evidence that this has been detrimental to children's surgical services in DGHs[15].

Introduction – Surgery in Children study

There is a concern regarding the deskilling of surgeons and anaesthetists in DGHs who care for children which may limit their ability to manage critically ill children who present at their hospital[16]. The development of clinically managed networks for children's surgical and anaesthetic care has been recommended as a solution to this problem[17-20] but as yet has not been fully implemented. There is a risk of reaching a tipping point in the surgical and anaesthetic care of children in DGHs and several professional bodies have been calling for an urgent national review of paediatric surgical and anaesthetic services.

Whilst there have been national reviews of some subspecialty paediatric surgical services such as cardiac[21] and neurosurgical services[22], there has been no similar review of those paediatric surgical services which provide the majority of care to children in the UK.

With these factors in mind, this study aims to provide valuable data on the current state of paediatric surgical and anaesthetic practice which can be used to inform and provide recommendations for those planning the future direction of surgical and anaesthetic services for children.

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Method

Aims
To explore remediable factors in the processes of care of children aged 17 and younger, including neonates, who died prior to discharge and within 30 days of emergency or elective surgery.
The aims were to look in detail at: 1. The organisational structure of services provided and 2. The quality of care received by individuals.

Expert group
A multidisciplinary group comprising consultants from surgery and anaesthetics (both paediatric general and cardiac), intensive care, nursing, a representative from the Centre for Maternal and Child Enquiries, a lay representative and a scientific advisor contributed to the design of the study and reviewed the findings.

Objectives
The Expert Group identified objectives that would address the overall aim of the study and these will be addressed throughout the following chapters:

- Organisational structure of care
- Pre-operative care and admission
- Inter-hospital transfer
- Networks of care
- The seniority of clinicians
- Multidisciplinary team working (including the involvement of paediatric medicine)
- Delays in surgery
- Anaesthetic and surgical techniques
- Acute pain management
- Critical care
- Comorbidities
- Consent

Hospital participation - organisational data and peer review data
All National Health Service hospitals in England, Wales and Northern Ireland as well as hospitals in the independent sector and public hospitals in the Isle of Man, Guernsey and Jersey were expected to participate if they undertook surgery in children aged 17 and younger. Within each hospital, a named contact, referred to as the NCEPOD Local Reporter, acted as a link between NCEPOD and the hospital staff, facilitating case identification, dissemination of questionnaires and data collation.

Population
Organisational data: All hospitals undertaking surgery in children were asked to return and organisational questionnaire.

Peer review data: All patients aged 17 years and younger, who died within 30 days of a surgical procedure (defined by the giving of a general or regional anaesthetic) between 1st April 2008 and 31st March 2010 were included in the study. For the purposes of the study, this also included patients who underwent interventional procedures or radiology either in the operating theatre or elsewhere. Throughout the report the term 'operation' refers to both surgery and interventional procedures.

Exclusions - Peer review data
1. A number of procedures were excluded where performed in isolation (See Appendix 4 on the website); 2. Patients undergoing surgery without the use of general or regional anaesthesia; 3. Patients transferred alive to another Trust following surgery, who subsequently died.

Method

Organisational questionnaire
Data on a hospital by hospital basis was collected to provide information on the facilities provided at all hospitals that undertook surgery in children irrespective of whether cases were included in the peer review aspect of the report. Data collected concerned networks of care, arrangements for the transfer of patients, critical care facilities, hospital facilities, acute pain management, pre-admission facilities, surgical facilities, and audit. Respondents were asked to categorise their hospital type. However, there were some inconsistencies in this designation, e.g. a hospital selecting both University Teaching Hospital and Specialist Tertiary Paediatric Centre and when a respondent categorised their hospital to be in more than one category it was allocated to the most appropriate category based on existing data on hospital types[11,18]. The fact that some respondents did not know how to define their hospital's purpose suggests that clearer definitions, or clearer communication of existing definitions is required. To ensure consistency with other similar datasets further cross-checking was undertaken to ensure robust categorisation for the purpose of analysis. The organisational questionnaire was sent to the Local Reporter for completion in collaboration with the relevant specialties. The Medical Director was also asked to contribute where appropriate.

Case ascertainment - peer review data
Cases were identified using OPCS codes. The NCEPOD Local Reporter identified all patients who died within their hospital(s) during the study period, within 30 days of the primary surgical procedure. The information requested for each case included the details of the surgeon and anaesthetist who carried out the procedure. All cases identified to NCEPOD with an included OPCS code were included in the study. Data concerning the type of anaesthetic administered was also requested but since this was not routinely recorded it was rarely available.

Clinical questionnaires and case notes
Two questionnaires were used to collect data for the peer review aspect of this study, a surgical questionnaire and an anaesthetic questionnaire per case included.

Surgical and anaesthetic questionnaire
The surgical questionnaire was sent to the surgeon who carried out the primary procedure of the patient's final admission. The anaesthetic questionnaire was sent to the anaesthetist who was responsible for the patient during the primary procedure of the final admission. These questionnaires covered all aspects of patient care from admission, to specific information around the procedure, to death. As the anticipated sample size was small, the number of questionnaires was not limited per surgeon. Where a surgeon or anaesthetist had more than one questionnaire to complete, extra time was given. These questionnaires were either sent directly to the surgeon or via the Local Reporter for dissemination, depending on the Trust's preference. It was also suggested that anaesthetists and surgeons liaised closely with neonatal/paediatric intensive care unit colleagues to answer some of the questions.

Method

Case notes

For each case, the following case note extracts were requested to enable peer review:

- Inpatient and outpatient annotations from preadmission (birth where applicable) to death;
- Integrated care pathways;
- Nursing notes;
- Drug charts;
- Imaging reports;
- Paediatric Intensive Care/Special Care Baby Unit charts;
- Fluid balance charts;
- Operation notes;
- Notes from multidisciplinary team meetings;
- Consent forms;
- Pathology results;
- Haematology and biochemistry results;
- Incident report form and details of outcome;
- Discharge summary;
- Operation notes;
- Anaesthetic charts;
- Pre-anaesthetic or pre-admission protocols/checklists;
- Recovery room records;
- Do Not Attempt Resuscitation documentation;
- Post mortem report.

Advisor groups

A multidisciplinary group of Advisors was recruited to review the case notes and associated questionnaires. The group of Advisors comprised: paediatric general/ urological surgeons, paediatric cardiac surgeons, paediatric otolaryngology surgeons, paediatric orthopaedic surgeons, paediatric neurosurgeons, paediatric cardiologists, specialist and non-specialist paediatric anaesthetists, paediatricians, neonatologists, emergency medicine physicians, paediatric intensivists, paediatric radiologists, and children's nurses.

All questionnaires and case notes were anonymised by the non-clinical staff at NCEPOD who removed all patient, clinician and hospital identifiers. The Clinical Coordinators at NCEPOD, and the Advisors had no access to such identifiers.

After being anonymised each case was reviewed by one Advisor within a multidisciplinary group. At regular intervals throughout each meeting, the chair (an NCEPOD Clinical Co-ordinator) allowed a period of discussion for each Advisor to summarise their cases and ask for opinions from other specialties or raise aspects of a case for discussion.

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Key findings and recommendations

Organisation of care - Transfer of children

Key findings
93% (266/285) of hospitals had a policy for the transfer of children to another hospital. However many of these policies did not include staffing arrangements for the transfer or family support during the transfer.

Recommendations
All hospitals that admit children should have a comprehensive transfer policy that is compliant with Department of Health and Paediatric Intensive Care Society guidance and should include; elective and emergency transfers, staffing levels for the transfer, communication procedures, family support, equipment provision and transport arrangements. *(Medical Directors)*

Peri-operative care – Inter-hospital transfer

Key findings
Most babies and children in this study were admitted as an emergency and were transferred to another hospital prior to surgery taking place.

Delays in transfer occurred in 34/176 cases. In 7/23 where an opinion could be made this was believed to affect outcome. In 91/159 cases where it could be determined it took more than six hours from the time of decision to transfer to being received in a centre where surgery took place.

Documentation of transfer events/detail and time of admission is poor within paediatric medical records.

Recommendations
National standards, including documentation for the transfer of all surgical patients, irrespective of whether they require intensive care need to be developed by regional networks. *(Network Leads)*

Hospital teams working in both specialist and non specialist centres should be in a state of readiness for transfer of babies and children requiring emergency surgery, and be prepared to provide high level and timely support for these transfers. Surgical emergencies may require rapid triage, simultaneous with resuscitation and communication with tertiary care providers. *(Medical Directors and Clinical Directors)*

When a decision to transfer a patient for (less urgent) surgical care has been made, this should be expedited. Transfer method and personnel should be agreed in advance. *(Clinical Directors)*

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Key findings and recommendations

Pre-operative care

Key findings

Pre-operative investigation and preparation were generally performed in a full and timely manner.

There was a frequent requirement for both basic radiology (216 investigations) and more complex investigation/ interventions (268 episodes) in the patients in this study.

Delays in surgical referral and diagnosis, and senior review were relatively unusual, but there were a few cases of both delay and undue haste in the decision to operate some of which affected outcome.

MDT meetings prior to surgery were performed in just over a third of this population. Where this was not the case senior clinician involvement of an appropriate level was generally apparent. However documentation of this involvement was lacking in 58/185 cases.

Recommendations

Expertise in paediatric radiology is an essential adjunct to the running of a service for children requiring surgery.

Multidisciplinary team meetings for complex cases should be undertaken pre-operatively except when this is predicated by the urgency of the case. Documentation of inter-professional discussions is essential even if written in retrospect. *(Medical Directors and Clinical Directors)*

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Key findings and recommendations

Consent and information for patients & parents

Key findings

Consent was not always taken by surgeons who were fully conversant with the operation performed and documentation of seniority was poor.

Risk of death was often not formally noted or quantified during the consent process or documented in discussions with patient/parents and carers.

Even in retrospect surgeons and Advisors had difficulty quantifying risk.

Recommendations

Consent by a senior clinician, ideally the one performing the operation should be normal practice in paediatrics, as in other areas of medicine and surgery. Documentation of grade confirms that this process has occurred. This is already a national recommendation. *(Medical Directors and Clinical Directors)*

In surgery which is high risk due to co-morbidity and/or anticipated surgical or anaesthetic difficulty, there should be clear documentation of discussions with parents and carers in the medical notes. Risk of death must be formally noted, even if difficult to quantify exactly. *(Consultants)*

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Key findings and recommendations

End of life care

Key findings

End-of-life care planning was absent in at least 50% of children in whom it would have been appropriate.

Following the death of at least 36 children there was no discussion between the surgical team and the parents. Poor documentation prevented the assessment of this in a further 76 deaths.

Documentation that confirmed that the death was discussed at a morbidity and mortality meeting was only present in the case notes of 126/378 children although such information may have been recorded elsewhere.

There were many other instances of poor documentation that need to be addressed including name and grade of both surgeon and anaesthetist, end of life care planning and discussions with parents after death.

Recommendations

National guidance should be developed for children that require end-of-life care after surgery. *(Department of Health, Royal Colleges, appropriate specialist societies)*

Clinicians must ensure that appropriate records are made in the medical notes of all discussions that take place with a child's parents or relatives after death. In addition it is mandatory that the name and grade of clinicians involved at all stages of care are clearly recorded in the medical notes and on anaesthetic and operation records. *(Guidelines from Royal Colleges/specialist societies and Medical Directors)*

Confirmation that a death has been discussed at a morbidity and mortality meeting is required. This should comprise a written record of the conclusions of that discussion in the medical notes. *(Medical Directors)*

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Further key findings

Peri-operative care
Overall quality of care in the majority of patients was good (71%), with room for improvement in aspects of care in 26%. In 11 cases (2.9%) care was less than satisfactory.

Surgical care
The majority (297/348) of operations were performed by consultant surgeons. 51/348 were performed by other grades and where this was the case it was considered inappropriate in 4/51 cases.

The Advisors considered that an appropriate operation had been performed in 348/362 cases. When this was not the case the outcome may have been affected in 5/14 operations.

Anaesthetic care
There was a good level of cover by consultant anaesthetists (269/289) where this was known.

In only 10/317 procedures did the Advisors consider that the anaesthetic technique was inappropriate. This may have affected the outcome in four children. Overall the provision of anaesthetic services seems to have been very satisfactory.

Post operative care
In the main the level of care (Levels 1, 2 and 3) provided postoperatively was appropriate.

Complications were common (254/368). In 22/254 instances the Advisors were of the opinion that management was sub-optimal and definitely affected the outcome in 8/10 children in whom it was possible to make a judgement. However given the range of specialties involved in the care of these children there did not appear to be a common theme upon which to base recommendations for reducing this incidence.

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