Stabilisation of the critically ill child

Study protocol – June 2025

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Introduction

Stabilisation of the critically ill child involves rapid assessment and emergency intervention to restore to normality, and maintain, physiological stability as a bridge to definitive treatment. Typically, definitive treatment requires transfer to a paediatric intensive care unit (PICU). However, initial recognition and stabilisation more commonly occurs in non-tertiary hospitals, creating unique challenges for clinicians not trained in paediatric intensive care medicine. This has led to concerns about the timeliness and quality of stabilisation care delivered to critically ill children. [1,2]

Since 1997, paediatric critical care services have been centralised in specialist hubs. As a result, clinicians in non-tertiary hospitals—particularly anaesthetists and emergency department staff—may now have fewer opportunities to develop or maintain their skills in managing critically ill children. This reduced exposure has potentially contributed to a lack of confidence and preparedness in managing paediatric emergencies, which may delay stabilisation efforts.[3,4] Indeed, clinicians may opt to transfer a critically ill child due to limited paediatric experience. In addition, many non-tertiary hospitals lack consistent access to specialised paediatric equipment, further hindering the delivery of safe and age-appropriate stabilisation care.[5]

Although severe adverse events and deaths during stabilisation of the critically ill child are uncommon, these events can profoundly affect patients, families, and hospital staff. For hospital staff—particularly less experienced resident doctors and junior nurses—the moral injury incurred can be great.[6,7] Higher rates of adverse airway management events during stabilisation have been reported in non-tertiary hospitals than in tertiary hospitals which suggest the moral injury to staff may be incurred more in non-tertiary hospitals.[2] In addition, there is evidence of inconsistent access to post-incident support for families and healthcare staff, which can exacerbate emotional distress and contribute to long-term psychological impact.[7]

Only around 11% of hospitals where children may present have on-site paediatric critical care facilities and just 23% of hospitals without a PICU have specialist paediatric anaesthetic cover.[8] Data from PICANet shows an increase in the transfer of low acuity children to PICUs, potentially reflecting some non-tertiary hospitals' reticence in managing children due to limited, or no, on-site specialised paediatric specialty cover.[9]

There are also significant organisational challenges to delivering effective stabilisation care for critically ill children in non-tertiary hospitals, including poorly defined referral pathways to tertiary care, inconsistent lines of communication between secondary and tertiary hospitals, access to acute imaging, and variable implementation of escalation frameworks such as Paediatric Early Warning Systems (PEWS) and Martha's Rule. These organisational gaps can result in delays in recognising deterioration, initiating timely interventions, and arranging appropriate transfers to specialist centres.[10,11]

This study will aim to identify examples of both good and poor practice in the care provided to children who require stabilisation while in hospital and assess critical care training among non-specialist healthcare providers and support from tertiary centres, and the impact of stabilisation processes on healthcare teams and families. The end report will inform strategies designed to standardise clinical practice, enhance patient outcomes, and strengthen support mechanisms for patients, families and healthcare professionals.

Guidelines and standards

- Paediatric Intensive Care Audit Network, 2024. State of the Nation Report 2024. https://www.picanet.org.uk/wp-content/uploads/sites/25/2024/12/PICANet-NPCCA-State-of-the-Nation-Report-2024_v1.0-12Dec2024.pdf
- Royal College of Anaesthetists, 2023. At the Heart of the Matter. Report and findings of the 7th National Audit Project of the Royal College of Anaesthetists examining Perioperative Cardiac Arrest. https://www.rcoa.ac.uk/research/research-projects/national-audit-projects-naps/nap7-report
- Nuffield Council on Bioethics, 2023. Disagreements in the care of critically ill children. https://assets.publishing.service.gov.uk/media/651597336a423b000df4c579/NCOB-web-version-independent-review-disagreements-in-the-care-of-critically-ill-children-september-2023.pdf
- Getting It Right First Time, 2022. Paediatric Critical care. GIRFT Programme National Specialty Report. https://gettingitrightfirsttime.co.uk/medical_specialties/paediatric-critical-care/
- The Faculty of Intensive Care Medicine and Intensive Care Society, 2022. Guidelines for the Provision of Intensive Care Services. https://ficm.ac.uk/sites/ficm/files/documents/2022-07/GPICS%20V2.1%20%282%29.pdf
- Paediatric Critical Care Society, 2021. Quality Standards for the Care of Critically Ill or Injured Children. https://pccsociety.uk/wp-content/uploads/2021/10/PCCS-Standards-2021.pdf
- National Institute for Health and Care Excellence, 2021. Babies, children and young people's experience of healthcare. https://www.nice.org.uk/guidance/ng204/resources/babies-children-and-young-peoples-experience-of-healthcare-pdf-66143714734789
- National Confidential Enquiry into Patient Outcome and Death, 2020. Balancing the Pressures. https://www.ncepod.org.uk/2020ltv/LTV_Full_Report.pdf
- National Children's Hospitals Bereavement Network, 2020. Bereavement support standards for children's hospitals within the UK or district general hospitals that offer services for children and families. https://www.togetherforshortlives.org.uk/app/uploads/2020/09/V4.2-Bereavement-Standards.pdf
- NHS England and NHS Improvement, 2019. Paediatric critical care and surgery in children review: summary report. https://www.england.nhs.uk/wp-content/uploads/2019/11/paediatric-critical-care-and-surgery-in-children-review-summary-report-nov-2019.pdf
- Royal College of Paediatrics and Child Health, 2018. Facing the Future: Standards for Children in Emergency Care Settings. https://www.rcpch.ac.uk/sites/default/files/2018-06/FTFEC%20Digital%20updated%20final.pdf
- Royal College of Paediatrics and Child Health, 2014. High Dependency Care for Children – Time To Move On. https://www.rcpch.ac.uk/sites/default/files/2018-07/high_dependency_care_for_children_-_time_to_move_on.pdf

Aim and objectives

Aim

- To identify good practice and areas for improvement in the quality of care provided to patients 0-18th birthday who are critically ill and require stabilisation
- To review the impact of delivering that care on staff, patients and parent carers

Objectives

Organisational issues

Data to be collected from the organisational questionnaire

To review the organisation of services for patients who are critically ill and require stabilisation, including:

- The organisation of services (including type of organisation, staffing arrangements, access to PHDU/HDU/PICU/ICU, the size of the paediatric unit)
- The availability of/access to decision making tools (e.g. Paediatric Early Warning Systems (PEWS))
- Protocols, pathways of care, and the use of guidelines and apps
- Networks of care (including shared decision making between organisations)
- Transfer arrangements (including methods of transport, time to nearest PHDU/HDU/PICU/ICU, location of transfers)
- The availability of staff (including competency and the ability to maintain skills, e.g., if the number of cases is low, the availability of Paediatric Critical Care Outreach (PCCO)/ Critical Care Outreach teams (CCOT), support from adult ICU)
- The appropriateness of care settings (including criteria for where patients are cared for)
- The availability of equipment
- Access to diagnostics (imaging)
- Access to therapy (including paediatric respiratory physiotherapy)
- Moral injury – staff sickness and retention, debriefing including access to psychological support and counselling
- The availability of information for staff (including access to different patient administration systems within and between hospitals)
- The availability of information, support services and facilities for patients and parent carers
- Training, education and the retention of skills
- Audit (including the use of the Patient Safety Incident Response Framework (PSIRF), and shared information across organisations)
- The use of Martha's Rule[10] (where applicable), or equivalent

Clinical issues

Data collected from the clinical questionnaire, the reviewer assessment form and clinician survey.

To explore:

- The initial recognition for the need for stabilisation (including source of referral, triage and location of care)
- The assessment process (including investigations and specialty review)
- The stabilisation process (including communication, staff involved in the stabilisation process, equipment available, and whether the patient had the appropriate intravenous access and respiratory support)
- Staffing arrangements (including the grade/specialty of clinicians assessing, diagnosing and treating/stabilising patients)

- The decision-making process (who was involved, was it timely, were there ceiling of treatment conversations)
- The use of decision-making tools and guidelines/protocols/apps (e.g. Martha's Rule, PEWS) (including network support)
- Transfer arrangements (including the decision-making process around which patients were transferred or not, why they were/were not transferred and whether this was appropriate)
- Moral injury – workforce and parent carer thoughts and feelings (clinician, patient & parent carer survey)

Methods

Inclusion criteria

Patients aged 0 to 18th birthday, who require stabilisation in hospital between the 1st October 2024 – 31st March 2025 (admission may have been prior to this date). Patients will be identified for inclusion from hospital patient administration systems and via paediatric critical care transport team records.

Via hospital patient administration systems

Local reporters will be asked to populate the patient identification spreadsheet with the details of patients who were:

- Admitted to critical care (level 2 (PHDU/HDU) or level 3 (PICU/ICU) care)
- Seen in the Emergency Department and have one of the included SNOMED CT or OPCS codes (listed below):
- Transferred to another hospital

If any one of the three criteria above are met, the patient should be included on the patient identification spreadsheet

SNOMED CT/OPCS codes for inclusion

	SNOMED CT code	**OPCS code**
General anaesthesia	50697003	Y80
Non-invasive ventilation	428311008	E85.2
Insertion of endotracheal tube	112798008	X56.2 X56.9
Insertion of catheter into artery	392247006	L70.4
Central venous cannula insertion	233527006	L91.2 Y53.9
Intraosseous cannulation	430824005	Y33.0

Via paediatric critical care transport team records

Local reporters in the Trusts/Health Boards where the paediatric critical care transport teams are based will be asked to populate the patient identification spreadsheet with the details of patients who were:

- Discussed with a critical care/paediatric transport/retrieval team during stabilisation
- Transferred by a critical care/paediatric transport/retrieval team

Exclusions

- Patients admitted to the Neonatal Intensive Care Unit (NICU) or Special Care Baby Unit (SCBU)

- Patients who are admitted as a result of trauma (ICD10 codes T00 – T88) to a major trauma centre (patients admitted as a result of trauma to a non-major trauma centre will still be included)
- Patients admitted to independent hospitals

Data sampling time frames
The timeframe from which data will be sampled will be between the 1st October 2024 – 31st March 2025.

Participating providers of healthcare
All acute hospital providers where patients might be admitted will be asked to participate in the study.

Incidence and prevalence of the exemplar conditions
The State of the Nation report, 2024 (Paediatric Intensive Care Network: PICANet) identified 18,498 admissions to PICU in 2023 (approx. 50 admissions a day or 1,542 admissions a month).

Early scoping has identified 828 patients admitted to PHDU/HDU/PICU/ICU from 54 Trusts/Health Boards over a one-month period. This is an average of 15.3 per Trust/Health Board per week (range, 0-104; median, 3; Mode, 0). Based on data returns from 125 Trusts/Health Boards, this would identify approximately 1938 patients per month for inclusion in the study. Based on the range of patients identified from each Trust/Health Board, data will be collected over a six-month period to ensure patients are identified from centres where a smaller number of patients are admitted.

Study promotion
Prior to data collection, NCEPOD will contact all hospitals and paediatric critical care transport teams providing care to this group of patients. The study will also be promoted via NCEPOD Local Reporters (sending the study poster on to the relevant departments), the relevant Colleges and Associations, and any relevant patient groups and third sector organisations.

Study method test
The data collection methods and data collection tools will be tested to ensure they are robust before the full study is run.

Methods of data collection

There will be five main methods of collecting data for the study:

1. Patient and parent carer views will be collected through focus groups and an online anonymous survey. We will work with Local Reporters, and relevant charities (e.g. WellChild, Together for Short Lives, Child Bereavement UK, Cosmic) to encourage involvement.

2. Clinician views will be collected through an online anonymous survey. We will work with Local Reporters and study contacts to encourage involvement from clinicians.

3. An organisational questionnaire will be sent for all acute hospitals where patients might present.

4. Clinical data collection – retrospective data collection: For a sample of patients, a questionnaire will be sent to the clinician responsible for the patient at the time of admission (stabilisation questionnaire), and to the team who received the patient for their definitive critical care admission (critical care questionnaire) (where applicable)

5. Case note review: Copies of selected extracts of case notes will be collected for peer review.

Further details on the methods of each method of data collection are given below.

1. Anonymous online patient and parent carer surveys and focus group interviews
The survey and focus group interviews will gather data on the parent carer views of the services available to them. It will also collect information around support services and information and facilities available to parent carers of young people who require stabilisation. The data will not be linked to any other aspects of data collection.

2. Anonymous online clinician survey
The survey will gather data on clinician views of the services available for them to provide to patients who require stabilisation. It will also collect information around confidence, competency, training and support available when providing care to this group of patients. The data will not be linked to any other aspects of data collection.

3. Organisational questionnaire
Data will be collected at a hospital level and will collect information around decision making tools, the organisation of services, protocols and pathways of care, networks of care, transfer arrangements, staffing arrangements, the appropriateness of care settings, the availability of equipment, diagnostics and radiology, moral injury, the availability of information, training, and audit and data collection. Questionnaires will be sent to all hospitals participating in the study via the online questionnaire system.

4. Clinical data collection – retrospective data collection
Patient identification
Two patient identification spreadsheets will be used to collect data for this study; one which identifies patients for inclusion via hospital patient administration systems (to be sent to all participating Trusts/Health Boards), and one which identifies patients via paediatric critical care transport teams records. The transport team spreadsheet will only be sent to the Trusts/Health Boards where the paediatric transport team are based (15 across England, Wales and Northern Ireland)

The Local Reporter will be asked to complete the patient identification spreadsheet with the details of all patients:

Via patient administration systems
- Admitted to critical care (level 2 (PHDU/HDU) or level 3 (PICU/ICU) care)
- Seen in the Emergency Department and have one of the included SNOMED CT or OPCS codes (listed above)
- Transferred to another hospital

Via paediatric critical care transport teams
- Discussed with a critical care/paediatric transport/retrieval team during stabilisation
- Transferred by a critical care/paediatric transport/retrieval team

The data fields requested in the patient administration system spreadsheet will include NHS number, hospital number, date of birth, sex, postcode, emergency department attendance details, date of admission, source of admission (including name of transferring hospital where applicable), SNOMED CT, ICD10 and OPCS codes, critical care admission details, discharge destination, date of discharge, clinician code and specialty for the clinician responsible at the time of admission, clinician code and speciality for the clinician responsible for receiving the patient into critical care (where applicable).

The data fields requested in the paediatric critical care transport team spreadsheet will include NHS number, hospital number, date of birth, sex, postcode, details of the stabilising hospital (Trust/Health Board and Hospital name), details of transfer arrangements (including the name of the receiving Trust/Health Board), and critical care admission details (where applicable).

Tracking healthcare across multiple organisations
Stabilisation care and admission to critical care may take place in different Trusts/Health Boards, therefore patient care will be tracked across multiple organisations to identify this. To enable us to identify whether a patient was transferred, transfer details will be requested in the patient identification spreadsheet, and the stabilisation questionnaire. If a patient is identified as being transferred and is not included on one of the original patient identification spreadsheets returned to NCEPOD, we will contact the local reporter to confirm whether the patient is known to their organisation for that episode of care using the NHS number and date of birth, prior to uploading the relevant questionnaire.

Clinician questionnaires
Two clinician questionnaires will be used to collect clinical data for this study:

1) Stabilisation questionnaire
2) Critical care questionnaire

Stabilisation questionnaire
The stabilisation questionnaire will be sent to the clinician responsible for the patient at the time of admission. Questionnaires will be sent to the NCEPOD Local Reporter for dissemination via the online questionnaire system. A reminder will be sent at six weeks and ten weeks where the data is outstanding. Up to 8 patients per hospital will be sampled for inclusion in the study.

Critical care questionnaire
Where applicable, the critical care questionnaire will be sent to the clinician responsible for the patient at the time of admission to their definitive critical care destination. This questionnaire will be sent to the NCEPOD Local Reporter for dissemination via the online questionnaire system. A reminder will be sent at six weeks and ten weeks where the data is outstanding.

5. Case note review
Photocopied case note extracts will be requested for each patient included in the study sample, from arrival at hospital to the point of transfer to the definitive critical care destination or discharge (whichever happens soonest).

Notes requested will include:

- 111 Pathway notes (from Adastra or similar) (where available)
- Ambulance patient report form

- Medical and nursing notes from ED clerking/admission to admission to definitive critical care destination/discharge (whichever happens soonest)
- Critical care notes if admitted as a place of holding during stabilisation before transfer to the definitive critical care destination
- NPEWS/PEWS charts
- Transfer arrangement notes
- Imaging reports
- Anaesthetic chart
- Drug charts
- Discharge summary

If the patient had a long hospital admission, the notes will be limited to the 48 hours prior to deterioration.

We are not requesting any critical care notes from the definitive critical care admission.

Upon receipt at NCEPOD the case notes will be redacted if not already done so prior to sending.

Reviewer assessment form

A multidisciplinary group of reviewers (detailed below) will be recruited to assess the case notes and questionnaires and provide their opinion on what went well and what did not go well during the process of care via the reviewer assessment form.

Table 2 summarises the data sources for significant points along the pathway.

Area of enquiry	**Method of data collection**	**Confidentiality**
Acute care	Case notes, clinician questionnaire, organisational questionnaire	Identifiable
	Online surveys	Anonymous

Sample Size

Data source	**Target number**
Organisational questionnaire	~250
Stabilisation questionnaires	Up to a maximum of 8 per hospital
Case note review	Up to a maximum of 8 per hospital
Patient and parent carer surveys (non-identifiable)	50
Clinician online survey (non-identifiable)	300

Analysis and Review of Data

Reviewers

A multidisciplinary group of reviewers will be recruited to assess the case notes and questionnaires and provide their opinion on what went well and what did not go well during the admission. The reviewer group will comprise intensivists (paediatric and adult – tertiary and secondary care), paediatric transport intensivists, emergency medicine clinicians (paediatric and adult), paediatricians, anaesthetists (paediatric and adult), physicians, critical care, emergency department and paediatric ward nurses, paediatric site practitioners, critical care outreach clinicians, and surgeons (paediatric and adult).

An advert will be sent to Local Reporters to disseminate throughout the relevant departments. It will also be placed on the NCEPOD website and social media channels. Successful applicants will be asked to attend a training day where they will each assess the

same two cases to ensure consistent assessment. A number of meeting dates will be arranged, and each reviewer will then be asked to attend a minimum of a further 4 meetings. NCEPOD staff will ensure there is a mix of specialties at each meeting from across the UK. Each meeting will be chaired by an NCEPOD clinical coordinator who will lead discussion around the cases under review. The meetings will either be held in person in the NCEPOD office, or over Microsoft Teams with secure and temporary access to the case notes for review (not downloadable or printable by the case reviewer). Towards the end of the study the reviewers will be invited to attend a meeting where the data will be presented to and discussed with them. The reviewers will also be sent two copies of the draft report for their comment as this is developed.

Confidentiality and data protection

All electronic data are held in password protected files and all paper documents in locked filing cabinets. As soon as possible after receipt of data NCEPOD will encrypt electronic identifiers and anonymise paper documents. Section 251 approval has been obtained to perform this study without the use of patient consent in England and Wales.

Ethical approval will not be required to undertake this study. Duty of candour is covered by the NCEPOD Cause for Concern policy, which ensure that any cases reviewed as less that satisfactory and as a cause for concern are discussed and action taken where required.

Study outputs

On completion of the study a report will be published and widely disseminated to all stakeholders to encourage local quality improvement (QI) (further details available in the communication plan). In addition to the report, supporting tools will be made available including:

- A summary report and summary sheet
- A patient information leaflet
- Infographics
- The recommendation checklist
- An audit tool
- A slide set
- A guide for commissioners
- Quality improvement tools
- Useful links for patients and parent carers

Examples of good practice will be shared, and additional QI tools will be developed where appropriate. Key messages from the report will be shared via social media.

Following publication, the report findings will be shared at national and local conferences, study days and other events; and papers submitted to journal for consideration for publication.

Data sharing

Post publication of the study there is the potential to share anonymised data sets with interested parties working in the same field. This will be undertaken following a strict process and will ensure the data does not become identifiable in their nature due to small numbers.

Definitions

Paediatric critical care

Level 2 PCCU (Paediatric High Dependency Unit (PHDU))

A discrete area where Level 1 and Level 2 paediatric critical care are delivered.
Other than in specialist children's hospitals, Level 2 Units should be able to provide, as a minimum, acute (and chronic) non-invasive ventilation (both CPAP and BiPAP support) and care for children with tracheostomies and children on long-term ventilation but should not be expected to deliver specialist Level 2 interventions such as ICP monitoring or acute renal replacement therapy. Within specialist children's hospitals, Level 2 units may provide some or all of these additional specialist interventions.

Level 3 PCCU (Paediatric Intensive Care Unit (PICU))

A unit delivering Level 2 and Level 3 paediatric critical care (and Level 1 if required)

Paediatric Critical Care Society. 2021. Quality standards for the care of critically ill of injured children. 6th edition.

Adult critical care

Level 2 critical care (High Dependency Unit (HDU))

Patients needing/requiring:

- Increased levels of observations or interventions (beyond level 1) including basic support for two or more organ systems and those 'stepping down' from higher levels of care.
- Interventions to prevent further deterioration or rehabilitation needs, beyond that of level 1.
- Two or more basic organ system monitoring and support.
- One organ system monitored and supported at an advanced level (other than advanced respiratory support).
- Long term advanced respiratory support.
- Level 1 care for organ support but who require enhanced nursing for other reasons, in particular maintaining their safety if severely agitated.
- Extended post-operative care, outside that which can be provided in enhanced care units: extended postoperative observation is required either because of the nature of the procedure and/or the patient's condition and co-morbidities.
- Patients with major uncorrected physiological abnormalities, whose care needs cannot be met elsewhere.
- Nursing and therapies input more frequently than available in level 1 areas.

Level 3 critical care (Intensive Care Unit (ICU))

- Patients needing advanced respiratory monitoring and support alone.
- Patients requiring monitoring and support for two or more organ systems at an advanced level.
- Patients with chronic impairment of one or more organ systems sufficient to restrict daily activities (co-morbidity) and who require support for an acute reversible failure of another organ system.
- Patients who experience delirium and agitation in addition to requiring level 2 care.
- Complex patients requiring support for multiple organ failures, this may not necessarily include advanced respiratory support.

Intensive Care Society. 2021. Levels of Adult Critical Care Second Edition. Consensus statement.

Timescale

	Oct 24	Nov 24	Dec 24	Jan 25	Feb 25	Mar 25	Apr 25	May 25	June 25	July 25	Aug 25	Sept 25	Oct 25	Nov 25	Dec 25	Jan 26	Feb 26	Mar 26	Apr 26	May 26	June 26	July 26	Aug 26	Sept 26	Oct 26	Nov 26	Dec 26
Form the Study Advisory Group (SAG)																											
First SAG meeting																											
Draft the protocol																											
Draft the questionnaires																											
Test the data collection method																											
Second SAG meeting																											
Finalise the protocol																											
Finalise the questionnaires																											
Submit final protocol CAG approval																											
Advertise the study																											
Advertise for reviewers																											
Start data collection																											
Reviewer meetings																											
Data analysis																											
Presentation to SAG and Reviewers																											
Presentation to Steering Group																											
Write the report																											
Report production 1st review																											
Report production 2nd review																											
Report production 3rd review																											
Submit report to HQIP																											
Publish the report																											

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