Children's Urgent Reduction of Forearm Fractures in the Emergency Department (CURFFED)

A multi-centre observational audit assessing the initial management of the paediatric forearm and distal radius fractures.

Summary

Aim: The primary aim is to determine how children's paediatric forearm and distal radius fractures are managed in the United Kingdom in comparison to BOAST standards.

Hospital eligibility: Any hospital in the United Kingdom managing paediatric forearm and distal radius fractures.

Inclusion criteria: Consecutive patients less than 16 years' old undergoing manipulation of paediatric forearm and distal radius fractures attending fracture clinic.

Team: Individual hospital teams made up of four people including a consultant Team Lead.

Time period: Injuries sustained between 00:00 1st March 2024 and 23:59 30th April 2024 with follow-up to extend up to 7th July.

Registration: Interested participants should register online **here**

Investigators

Steering Committee:
Mr Rob Whitham, Specialty Registrar, Royal United Hospital, Bath
Mr Luke Duggleby, Specialty Registrar, Royal United Hospital, Bath
Mr Lysander Gourbault, Specialty Registrar, Gloucester Royal Hospital
Mr Alexander Christie, Specialty Registrar, Royal United Hospital, Bath
Ms Erin Jones, Core Surgical Trainee, Royal United Hospital, Bath
Mr Andrew Womersley, Core Surgical Trainee, Royal United Hospital, Bath

Project Advisors:
Mr Guy Atherton, Consultant Paediatric Orthopaedic Surgeon, Bristol Children's Hospital, and British Society for Children's Orthopaedic Surgery (BSCOS) President

Project Support:
South West Surgery in Children Operational Delivery Network (SW SIC ODN)
Bristol Orthopaedic Registrars' Group (BORG)

Abstract

Background: Forearm and distal radius fractures are the most common site of fracture in children. Most of these fractures can be managed without procedural intervention. If manipulation is required, the majority benefit from being performed early in the Emergency Department, thus avoiding the need for admission and a general anaesthetic. National standards have been introduced to improve the care of these patients (BOA, 2021).

The Getting It Right First Time (GIRFT) Programme identified great variability in the management of these injuries between units and found that a significant proportion of patients are undergoing manipulation under anaesthesia in the operating theatre (GIRFT, 2022). This is often despite patients being deemed appropriate for manipulation in the ED and high patient and parental acceptability of this process (BOA, 2022).

The study will be organised in two parts: an audit against BOAST standards, and a questionnaire.

Study aims: The primary aim of the audit is to determine how children's paediatric forearm and distal radius fractures are managed in the United Kingdom in comparison to BOAST standards.

The aims of the questionnaire are 1) To assess potential barriers to early manipulation of paediatric forearm and distal radius fractures in the Emergency Department 2) To assess ED and T&O clinicians' views on the most appropriate form of analgesia for manipulation of these fractures.

Methods:

Part 1: Patients aged 0-16 years old sustaining a forearm or distal radius fracture between 00:00 1st March 2024 and 23:59 30th April 2024 will be identified at their fracture clinic appointment. Data to be collected includes: age, sex, type of fracture, use of manipulation, use of X-rays, clinic appointments.

Patients' records will then be reviewed to assess compliance with BOAST standards with a minimum of 8 weeks follow-up.

Data will be sought from paper and electronic documentation, post-operative imaging and trauma conference discussions.

Part 2:
A short questionnaire to be completed by ED and T&O registrars, trust grades, associate specialists and consultants involved in the management of paediatric forearm and distal radius fractures. This will assess their views on appropriateness of analgesia for reduction and their perceived barriers to early manipulation of these fractures in ED.

Expected Outcomes of the Study: This project will assess national compliance with BOAST standards. It is anticipated that the results will help to improve patient care by informing future research and changing clinical practice.

Part 1 – Audit Protocol

Study aim

- to determine how children's paediatric forearm and distal radius fractures are managed in the United Kingdom in comparison to BOAST standards

Primary Outcome

- Adherence to BOAST guidance

Strategy

Conduct an audit over a two-month period, assessing the initial management of forearm and distal radius fractures according to the following standard (BOA, 2021):

Standards for Practice

1. All units managing children's forearm fractures should have protocols to enable early, definitive manipulation and casting without necessitating admission. This protocol should specifically address processes around procedural analgesia and sedation as well as the timely response to manipulation.
2. A documented assessment of the limb, performed on presentation, should include the status of the radial pulse, digital capillary refill time and the individual function of the radial, median and ulnar nerves.
3. At the time of initial assessment, effective analgesia should be administered. Pain scores should be recorded frequently, to ensure that pain relief is maintained throughout.
4. Orthogonal X-rays should be available to allow proper diagnosis and planning.
5. The child, if competent, carers and clinicians must agree with the intervention. Formal consent should be documented according to local protocols.
6. Manipulation of children's fractures should occur in a location suitable to ensure safe practice with monitoring and appropriate facilities to afford effective treatment and casting, managing complications of and recovery from medication.
7. Manipulation of a child's forearm fracture should be performed by competent orthopaedic practitioners, as defined by local protocols.
8. Manipulation of a child's forearm fracture should be followed by orthogonal X-rays.
9. Before discharge a recorded assessment of the neurovascular status of the limb should be repeated as described in standard two.
10. Oral analgesia to take home and dedicated information leaflets, that include red flag symptoms and contact details, should be provided. Prior to discharge, a fracture clinic appointment should be made to occur within 7 days of injury.
11. A documented review of the case and images by a consultant orthopaedic surgeon should occur within 48 hours of injury.
12. Regular multi-disciplinary audit against the above standards should be undertaken, which should include monitoring of the rate of admission for further procedures on the limb.

Standards

BOAST Standards, BOA 2021

Data Sources

Trauma databases, clinic lists, coding, hospital imaging systems

Inclusion Criteria

- All patients under the age of 16
- Forearm or distal radius fracture
- Injury sustained between 00:00 1st March 2024 and 23:59 30th April 2024

Exclusion Criteria

- Injury presenting to the Emergency Department more than 48 hours following the injury
- Buckle fractures of the forearm or distal radius

Methods

CURFFED should be registered as a clinical audit. Confirmation that ethical review is not required for CURFFED can be found in Appendix 1.

Patients meeting the inclusion criteria will be identified when attending fracture clinics with injuries sustained over the above mentioned time period. Patients' records will then be reviewed to assess compliance with BOAST standards with a minimum of 8 weeks follow-up. Data to be collected includes: age, sex, type of fracture, use of manipulation, use of X-rays, clinic appointments.

Data will be collected on a password protected spreadsheet and stored on local NHS computers. Once data collection has been completed the hospital numbers and patient identifiable data will be removed and sent via secure NHS email to the national audit leads at swsicodn@uhbw.nhs.uk. Data from this study will be retained on NHS servers and will not be removed from the UK. Deadline for data to be shared with the steering committee is 14/07/2024.

Analysis

- % compliance with all standards will be calculated for each hospital
- Significance level for analyses will be set at 0.05

Safety Considerations

This project doesn't involve direct patient contact and will require review of documentation.

Quality Assurance

Approval will be sought from local clinical governance/audit departments in each participating trust/hospital by the local lead. Caldicott guardian approval will be sought before data is shared with the lead centre. Confirmation of this will be sent to the audit steering committee.

Expected Outcomes of the Study

This project will provide information about the management of patients with wrist and forearm fracture and assess compliance with the BOAST guidance. It is anticipated that the results will help to improve patient care by informing future research and changing clinical practice.

Dissemination of Results and Publication Policy

Overall results will be shared with each participating unit. In addition, unit level results will be made available to each unit. This can be shared at clinical or management level.
It is intended that the findings of this project will be submitted to a peer-review journal and presented at meetings to disseminate the findings of this project at a national level.

Duration of the Project

Data will be collected on patients under the age of 16 sustaining a forearm or distal radius fracture between 00:00 1st March 2024 and 23:59 30th April 2024. Patients' notes will be followed-up for 8 weeks following their injury.

Data management

All data will be handled in accordance with the Data Protection Act 2018.
Data will be collected and stored on secure NHS computers. Anonymised data from local hospitals will be shared via secure NHS emails to the SW SIC ODN.
Collaborators will provide evidence to the steering committee that they have:

(i) Successfully registered CURFFED with their local audit department
(ii) Caldicott Guardian permission for data to be shared with the steering committee

Collaborator Criteria and Project Management

Each local team will be made of a consultant supervisor, a registrar and up to two further individuals. Each collaborator (not including supervising consultants) must submit a minimum of 5 cases to the data spreadsheet. All deadlines outlined in the Step-by-step guide must be adhered to.

Ethics

The primary ethical consideration in this study is patient and data anonymity. This will be undertaken at the unit level with only the local investigators accessing identifiable data. These investigators would routinely have access to this data as part of their daily work.
This study is an audit of routine practice/ service evaluation using anonymised data, therefore ethical approval is not required. Caldicott guardian approval will be sought from each centre prior to sharing anonymised data with the steering committee.

Part 2 – Questionnaire

Background

Early manipulation of paediatric forearm and wrist fractures in the Emergency Department is usually beneficial for the child and the healthcare system as it avoids the need for admission and a general anaesthetic. A regional survey found differing opinions between Emergency Department (ED) and Trauma and Orthopaedic (T&O) practitioners regarding what constitutes appropriate analgesia for reduction of these fractures. Despite the development of a standardised pathway by the GIRFT Programme (GIRFT, 2023), a significant proportion of patients are requiring reduction in theatre despite being deemed appropriate for manipulation in ED by T&O and often ED clinicians.

Aims

1. To assess potential barriers to early manipulation of paediatric forearm and distal radius fractures in the Emergency Department
2. To assess ED and T&O clinicians' views on the most appropriate form of analgesia for manipulation of these fractures

Strategy

Short questionnaire to be completed by ED and T&O registrars, specialty doctors, associate specialists and consultants involved in the management of paediatric forearm and distal radius fractures.

Methods

- All ED and T&O registrars, specialty doctors, associate specialists and consultants working in hospitals that are participating in the CURFFED audit shall be asked to complete the questionnaire found here (link also in Step-by-step guide on our website)
- A minimum of 10 responses per hospital should be collected with at least 5 consultants (ideally both ED or T&O) and 5 members of ED
- Questionnaires should be completed by 14/07/2024

Appendix

Appendix 1

Go straight to content.

Medical Research Council

NHS Health Research Authority

Is my study research?

To print your result with title and IRAS Project ID please enter your details below:

Title of your research:

Children's Urgent Reduction of Forearm Fractures in the Emergency Department (CURFFED)

IRAS Project ID (if available):

You selected:

- **'No'** - Are the participants in your study randomised to different groups?
- **'No'** - Does your study protocol demand changing treatment/ patient care from accepted standards for any of the patients involved?
- **'No'** - Are your findings going to be generalisable?

Your study would NOT be considered Research by the NHS.

You may still need other approvals.

Researchers requiring further advice (e.g. those not confident with the outcome of this tool) should contact their R&D office or sponsor in the first instance, or the HRA to discuss your study. If contacting the HRA for advice, do this by sending an outline of the project (maximum one page), summarising its purpose, methodology, type of participant and planned location as well as a copy of this results page and a summary of the aspects of the decision(s) that you need further advice on to the HRA Queries Line at Queries@hra.nhs.uk.

For more information please visit the Defining Research table.

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