

Femoral Fracture Pathway - Full Paediatric Clinical Guideline Joint Derby and Burton

Reference no.: CH CLIN C45/April 22/v003

1. Introduction

This guidance provides information for the management of femoral fracture within the Children's Emergency Department setting

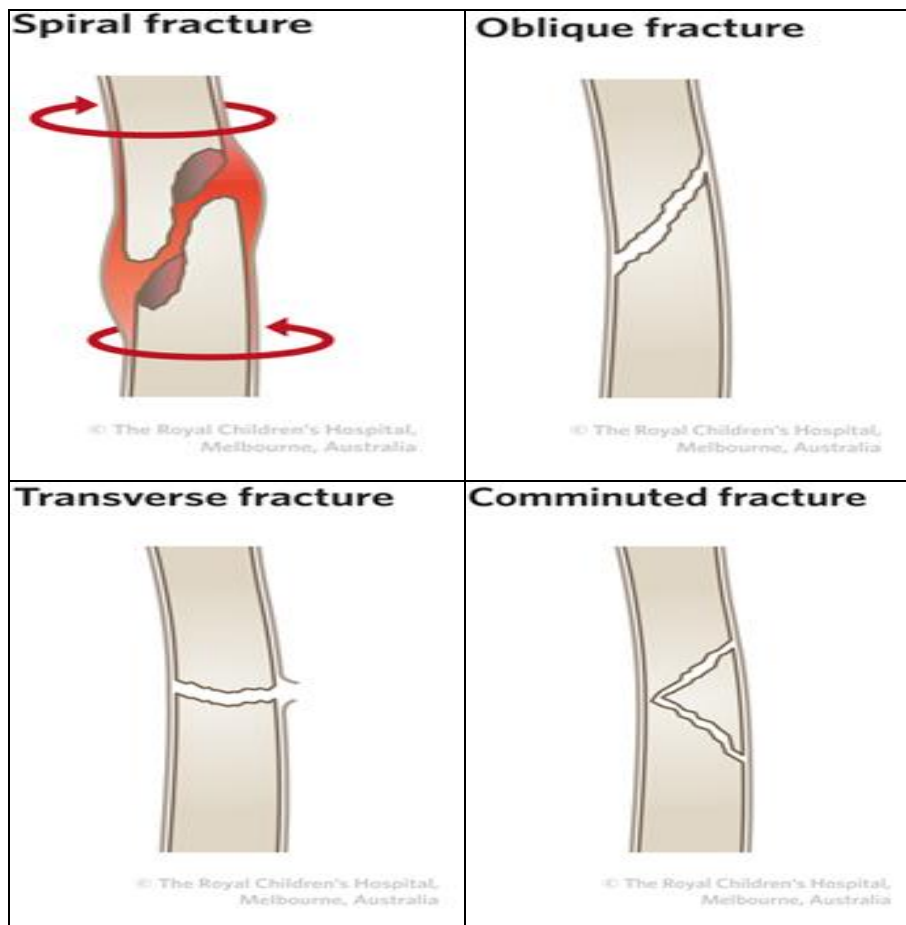
2. Aim and Purpose

To ensure all medical and nursing staff are aware of the correct procedure for managing a diagnosis of femoral fracture, including pain relief and indication for an urgent orthopaedic referral.

3. Definitions

CLASSIFICATION

- Femoral shaft (diaphyseal) fractures can be classified according to:
 - Location - proximal, middle or distal third
 - Amount of displacement, angulation and extent of shortening
 - Fracture pattern - transverse, oblique, spiral or comminuted



4. Main body of Guidelines

INCIDENCE

- Femoral shaft fractures represent approximately 1.6% of all paediatric fractures. It peaks in early childhood and early adolescence.
- In older children, high energy trauma (e.g. motor vehicle accidents) is the mechanism of injury 90% of the time. In younger children, these fractures are usually due to falls. In children under four years of age, up to 30% of femur fractures are associated with non-accidental trauma. In children that are not yet walking, non-accidental trauma must be considered as a possible mechanism.

CLINICAL FINDINGS

The thigh will be swollen and deformed. Any movement through the leg will result in significant pain.

Other clinical findings will depend on mechanism of injury – it is important that all these children have a thorough primary and secondary survey performed, and acted upon

ED management

1. Any patient with a significant mechanism of injury should be assessed via Advanced Trauma Life Support (ATLS) principles. There should be early senior input (registrar or above). Management priorities should be:
 - Analgesia including immobilisation
 - X-ray
 - Orthopaedic referral
2. Femoral fractures are very painful and require repeated pain assessment. Recommended pain management options include:
 - Simple analgesia i.e. paracetamol + ibuprofen
 - Intranasal fentanyl – beware duration of action (~30-45 minutes) and need to follow up with further analgesia
 - Femoral nerve block – recommended for all femoral fractures; dependent on availability of skilled clinician. [See femoral nerve block guideline.](#)
 - IV opiates – if femoral nerve block not possible/appropriate, or to supplement other analgesia
 - Entonox – if appropriate for age and development; especially useful for transfers, movement, procedural support
 - Immobilisation of the fracture via traction significantly reduces pain and will reduce analgesic requirements. See traction demonstration videos on Neti.
3. X-ray
 - Anteroposterior (AP) and lateral x-rays of **the whole length of femur** should be ordered. The x-rays must show the full length of the femur (including hip and knee joint).



AP and lateral x-ray of the femur demonstrating a complete fracture of the femoral diaphysis.

4. Children that sustain femur fractures prior to walking age should have non accidental injury considered.
5. History and examination should include: age, fracture pattern, fracture location, soft-tissue trauma, neurovascular status and presence of associated injuries as these all influence the treatment modality.
6. If the patient is to be transferred to another hospital, the leg should be immobilised in a Kendrick, Thomas splint or a backslab.



INDICATION FOR URGENT ORTHOPAEDIC REFERRAL:

- Open fracture
- Neurovascular deficit
- Polytrauma patient (if trauma call not already activated)
- All femoral shaft fractures should be referred for an urgent orthopaedic assessment in the ED

Table 1: Treatment options for femoral shaft fractures by age.

| Age | Orthopaedic treatment options |
|------------------------------|--|
| ≤ 6 months | Pavlik harness Immediate spica cast |
| 6 months to 5 years | Immediate spica cast Traction → spica cast |
| 5-11 years | Flexible intramedullary nailing |
| 11 years - skeletal maturity | Rigid trochanteric entry nailing Submuscular plating Flexible intramedullary nail (only if <50 kg) |

Follow up:

Arranged by Orthopaedics

Outcome:

Outcomes for shaft fractures are generally good.

- Leg length difference - femoral shaft fractures can overgrow up to 2 cm in the 2 years after the fracture. The fracture can also heal in a shortened position.
- Malunion - the fracture is at risk of malunion, dependent on location and method of stabilisation.

5. Documentation Controls

| | | | |
|---|-------------------------|------------------------|---------------|
| Reference Number From Library and Knowledge Service Manager | Version: V003 | Status Final | |
| Version / | Version | Date | Author Reason |

| | | | | |
|--|---|------------|---|---------------------------|
| Amendment History | 3 | April 2022 | Dr Elizabeth Ivey | Guideline required update |
| Intended Recipients: Clinicians working in the Children's Emergency Department at RDH or seeing children in the Emergency Department at QHB. | | | | |
| Training and Dissemination: To be circulated via email then will be accessible within the paediatric emergency guidelines on the intranet. No specific training required for guideline users | | | | |
| Development of Guideline: Gis Robinson, Children's Emergency Consultant Job Title: Children's Emergency Consultant. Updated by Dr E Ivey, ST7 Paediatric Emergency Medicine Registrar | | | | |
| Consultation with: N/A | | | | |
| Linked Documents: Femoral Nerve Block guideline | | | | |
| Keywords: femur, femoral, splint, traction | | | | |
| Business Unit Sign Off | | | Group: Paediatric Business Unit Guidelines Group Date: 08/04/2022 | |
| Divisional Sign Off | | | Group: Women's and Children's Clinical Governance Group Date: 26/04/2022 | |
| Date of Upload | | | June 2022 | |
| Review Date | | | April 2025 | |
| Contact for Review | | | Gis Robinson, Children's Emergency Consultant | |