Management of Pediatric Long Bone Fractures

Purpose:

To provide guidance on the management of long bone fractures in pediatric trauma patients.

Background/definitions:

A long bone is defined as any bone of the extremity that has a length greater than the width to include:

- Femur
- Tibia/fibula
- Humerus
- Radius/Ulna

Management of pediatric long-bone injuries is highly dependent upon skeletal maturity. In general, the pediatric orthopedic surgery attendings manage long bone injuries in patients with immature skeletons (i.e. open growth plates), while adult orthopedic surgery attendings manage injuries in patients with mature skeletons (i.e. closed growth plates). The general cutoff is 16 years of age, although the final decision for management of an individual patient is at the discretion of the orthopedic surgery attending on-call, and can involve a discussion between the on-call attending surgeons for pediatric and adult orthopedic surgery. Discretion of casting versus operative care of these injuries is at the discretion of the orthopedic attending on call.

Guideline Inclusion Criteria:

- Injured children and adolescents 18 years and younger with a long bone fracture

Guideline Exclusion Criteria:

- Injured patients >18 years old.

Practice Recommendations for Management:

1. Long bone fractures should be stabilized as early as possible.
2. Orthopedic surgery will be consulted on all pediatric long bone fractures.
3. In the absence of polytrauma, definitive long bone stabilization of femoral shaft fractures should occur within 24 hours of arrival.

   - Other long bone fractures should undergo early fixation as deemed appropriate by the orthopedic team.
4. For the polytrauma patient, medical stability and concomitant injuries should be assessed prior to internal fixation. A damage control approach should be taken and the internal fixation of long bone fractures should be delayed until the patient is adequately resuscitated.
   - Internal fixation should occur within 48 hours of arrival in the polytrauma patient and after initial stabilization.
   - External fixation devices should be utilized until internal fixation is appropriate.
5. Children younger than thirty-six months with a diaphyseal femur fracture should be evaluated for child abuse.
   - For children younger than one year of age, the Child Advocacy Team (CAT) should be consulted for evaluation.
   - For children above one year of age, consultation of the Child Advocacy Team (CAT) will be at the discretion of the pediatric orthopedic and trauma surgery attendings on call.
6. Management of pediatric diaphyseal femur fractures will be at the discretion of the pediatric orthopedic attending on call, with reference to the 2020 AAOS Clinical Practice Guideline (pdffcpg.pdf (aaos.org)) on this injury.
7. Transfer of pediatric long bone fractures to Children's Nebraska for definitive management may be considered in the absence of polytrauma and requires approval from the trauma surgery attending on call.

Outcome Measures and Guideline Adherence:

1. Orthopedic response times for urgent consults as well as time to OR for definitive management of long bone fractures will be monitored through the pediatric trauma performance improvement process.
2. All transfers to Children's Nebraska will be reviewed through the pediatric trauma performance improvement process.

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References:

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2. American Academy of Orthopedic Surgeons. (2022). Treatment of Pediatric Diaphyseal Femur Fractures. https://www.aaos.org/globalassets/quality-and-practice-resources/pdff/pdffcpg.pdf

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