Femur Fractures v1.0

PHASE I (E.D. or Urgent Care)

Inclusion Criteria
• Suspicion for femur fracture

Exclusion Criteria
• None

ED Fracture Plan

Safety Checklist
- Vascular exam
- Neurologic exam
- Consider non-accidental trauma
- Check for open fracture

Orders
- Pain medication PO/IV/IN (if needed)
- X-rays (if not done)
- Nursing orders (eg. Pain assessment, NPO)
- Antibiotic for Ortho Fracture/Tetanus if indicated
- Consider sending pain prescriptions early

X-ray confirms femur fracture

Consult Orthopedics

Spica casting in ED?

Criteria for spica casting in Emergency Department

- Patient weight less than 15 kg
- Patient age less than 36 months
- Ortho attending present before starting sedation
- Patient admitted to hospital after procedure

Go to PHASE II (Orthopedic Assessment and Mgmt)

Concern for vascular or neurologic injury → Page orthopedics immediately

Concern for non-accidental trauma → discuss w/ attending and consider SCAN consult

For questions concerning this pathway, contact: EDFractures@seattlechildrens.org
© 2017 Seattle Children’s Hospital, all rights reserved. Medical Disclaimer
Last Updated: March 2017
Next Expected Revision: March 2022
PHASE II (Orthopedic Assessment and Management)

Inclusion Criteria
- Femoral diaphyseal (shaft) fractures

Exclusion Criteria
- Polytrauma
- Proximal or distal femoral fracture
- Metabolic bone disease
- Bone fragility conditions
- Pathologic fractures

Consult Suspected Child Abuse and Neglect (SCAN) → Suspect Femur Diaphyseal Fractures
- AP & Lateral Xray Femur include hip & knee

Differential Diagnosis
Alternate evaluation and management plan

Appropriate consultation evaluation

Asses for Pathologic Fracture

Assess other injury especially in high energy mechanism of injury

Isolated Femur treatment
PHASE II (Isolated Femur Treatment by Age)

0-6 MONTHS
- Pavlik Harness

6 MONTHS – 5 YEARS
- Early Spica (Gortex Liner)
  - Single vs 1 ½ vs 2

5 YEARS – 11 YEARS
- Length stable and WT < 49 KG
  - No
    - Flex Intramedullary Nailing
  - Yes
    - 1. Sub muscular plate
      - 2. Rigid Intramedullary Nail (never piriformis entry) if size appropriate

> 11 YEARS
- Length stable and < 49 KG
  - Yes
    - 1. Flexible or 2. Sub muscular plate
  - No
    - 1. Rigid Trochanteric Nailing (never piriformis entry)
    - 2. Sub muscular plate

Discharge Criteria
- No increased incision redness or pain
- Temp less than 38 C for last 12 hours
- Pain controlled without IV meds > 4hrs and pain score < 3 for last 4 hours
- Maintaining hydration orally/enterally and tolerates diet without emesis for 4hrs, Urine output 0.5mL/kg

Discharge Preparation
1. Spica cast, Pavlik harness or brace assessment of fit, skin and cast, and brace care instruction
2. Durable medical equipment assessment
3. Parent Education provided
   - Pain Medicine After Orthopedic Surgery – PE886
   - Spica Cast Care – PE005
   - Constipation After Surgery – PE432
4. Safe transport home arranged
5. Assessment of home and school environment

For questions concerning this pathway, contact: FemurFractures@seattlechildrens.org
© 2017 Seattle Children's Hospital, all rights reserved, Medical Disclaimer
PHASE III (Outpatient Management)
Isolated Femur Treatment by Age

0-6 MONTHS

6 MONTHS – 5 YEARS

5-11 YEARS

> THAN 11 YEARS

1 week follow up AP & Lateral x-ray

4 week follow up and AP & Lateral x-ray

Return to activity

Satisfactory alignment?

yes

no

Wedge or new cast alternative treatment method (especially 4-5 years)

2 week follow up AP & Lateral x-ray

Satisfactory alignment?

yes

4 more weeks (total 6 weeks)

no
Spica casting in ED?

Criteria for spica casting in Emergency Department

- Patient weight less than 15 kg
- Patient age less than 36 months
- Ortho attending present before starting sedation
- Patient admitted to hospital after procedure
Femur Fractures Pathway Approval & Citation

Approved by the CSW Femur Fracture team for March 15, 2017

CSW Supracondylar Team:

Ortho, CSW Owner: Mark Dales, MD
ED, Co-Owner: Brianna Enriquez, MD
Pharmacy: Chih-Hui Tracy Chen, PharmD, BCPS
Ortho, Nurse Practitioner: Brenda Eng, ARNP
ED, Clinical Nurse Specialist: Sara Fenstermacher, MSN, RN, CPN
Surgical, Clinical Nurse Specialist: Kristine Lorenzo, MS, RN, CPN
Fellow: Alex Mortimer, MD
Pharmacy: Chih-Hui Tracy Chen, PharmD

Clinical Effectiveness Team:

Consultant: Jean Popalisky DNP, RN
Project Manager: Asa Herrman
CE Analyst: Nate Deam
CIS Informatician: Michael Leu, MD
CIS Analyst: Heather Marshall
Librarian: Sue Groshong
Program Coordinator: Kristyn Simmons

Executive Approval:

Sr. VP, Chief Medical Officer: Mark Del Beccaro, MD
Sr. VP, Chief Nursing Officer: Madlyn Murrey, RN, MN
Surgeon-in-Chief: Bob Sawin, MD

Retrieval Website: http://www.seattlechildrens.org/pdf/femur-fractures-pathway.pdf

Please cite as:
This pathway was developed through local consensus based on published evidence and expert opinion as part of Clinical Standard Work at Seattle Children’s. Pathway teams include representatives from Medical, Subspecialty, and/or Surgical Services, Nursing, Pharmacy, Clinical Effectiveness, and other services as appropriate.

When possible, we used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial or cohort studies. The rating is then adjusted in the following manner (from: Guyatt G et al. J Clin Epidemiol. 2011;4:383-94.):

Quality ratings are **downgraded** if studies:
- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings are **upgraded** if it is felt that:
- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

Guideline – Recommendation is from a published guideline that used methodology deemed acceptable by the team.

Expert Opinion – Our expert opinion is based on available evidence that does not meet GRADE criteria (for example, case-control studies).

**Quality of Evidence:**
- 🌟🌟🌟🌟 High quality
- 🌟🌟🌟 Moderate quality
- 🌟🌟 Low quality
- 🌟ΟΟΟ Very low quality

Guideline
Expert Opinion
• **Version 1.0 (3/15/2017):** Go live
Medical Disclaimer

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children’s Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.
Search Methods, Femur Fractures Periodic Review, Clinical Standard Work

Studies were identified by searching electronic databases using search strategies developed and executed by a medical librarian, Susan Groshong. A search was performed in May 2015 in the following databases – on the Ovid platform: Medline and Cochrane Database of Systematic Reviews; elsewhere: Embase, Clinical Evidence, National Guideline Clearinghouse, TRIP and Cincinnati Children’s Evidence-Based Care Recommendations. Retrieval was limited to ages 0-18, English language and the period November 26, 2013 to current. In Medline and Embase, appropriate Medical Subject Headings (MeSH) and Emtree headings were used respectively, along with text words, and the search strategy was adapted for other databases. Concepts searched were femoral and subtrochanteric fractures. All retrieval was further limited to certain evidence categories, such as relevant publication types, index terms for study types and other similar limits. Additional articles were identified by team members and added to results.

Susan Groshong, MLIS
September 8, 2016

Flow diagram adapted from Moher D et al. BMJ 2009;339:bmj.b2535


