## Clinical Question

Does straightening angulated suspected long bone fractures, when compared with immobilizing in found position, improve the (management of pain; safer transport; prognosis for advanced care provider)?

### P – Persons with angulated suspected long bone fractures

Since article classification is based on use of final diagnostic classifications, not initial clinical observations search terms were generated based on fractures of long bones that would likely produce clinically apparent angulation to a minimally trained first aid provider. Thus, for search term generation, the condition becomes “angulated fractures of long bones” where the term “long bones” was limited to the humerus, radius, ulna, femur, tibia and fibula. Dislocations were excluded from the search terminology.

### I – Straightening

Medical terms for straightening were substituted: manipulation, reduction, closed reduction

### C – Immobilization without straightening

This term was searched as “immobilization OR splinting”

### O – less morbidity or mortality

Morbidity was interpreted as any problem issue addressed in fracture care; e.g., infection, malunion, vascular injury, pain or other issue addressed in an article. Outcome was not searched as a modifier, but addressed during review of articles.

### Is this question addressing an intervention/therapy, prognosis or diagnosis?

Intervention/therapy

### State if this is a proposed new topic or revision of existing worksheet:

NEW  (see following NOTE)

### Note: Related 2005 worksheets:

W 273. What is the safety, efficacy, and feasibility of straightening angulated long bone fractures? Michael Bosse, MD Rick Murray, EMT-P and related

W 260. What is the safety, efficacy, and feasibility of stabilization in the first aid management of an injured (suspected fracture) extremity? William Hammill, MD Richard Bissell, PhD

Both worksheets accessed at: http://circ.ahajournals.org/cgi/reprint/112/22_suppl/b1

No studies/articles were identified in either worksheet using the search criteria for 2005 reviews

### Conflict of interest specific to this question

Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? No

### Search strategy (including electronic databases searched).

**AHA Endnote X (2008) Master Library –**

**Cochrane Reviews (“All of the Cochrane Library” -** ( Humeral Fractures OR Radius Fractures OR Ulna Fractures OR Tibial Fractures OR ( Femoral Fractures NOT Hip Fractures ) ) AND ( emergency treatment OR "manipulation, orthopedic" )

**Hand Searching of references from articles retrieved** – no articles found.

**JSTOR** – “Leg fracture” OR “Arm fracture” AND "first aid”; “leg fracture” + reduction


**ToxNet** - Not searched

**Web of Science (Databases selected: Science Citation Index Expanded (SCI-EXPANDED)--1973-present**; leg/arm fracture AND first aid

**Forward searching** done through “Related articles” in PubMed and through “Cited By” in different publisher databases when articles retrieved for screening, whether the “start point” article was found to be relevant or not.

**EMBase** – not available

### State inclusion and exclusion criteria -

**Included** -

- Human and animal
- All ages
- International as catalogued in Medline

**Attempted to limit to** -
Clinical trials – none found directly addressing the PICO question
Randomized Controlled Trials – none found directly addressing the PICO question
Articles were included if they dealt with pre-hospital or emergency department straightening of fractures other than definitive treatment reduction except.
Articles were excluded if they were review articles, if they did not report a study of techniques, or if they were conference abstracts.
Exclusions - None other than in choices of subheadings in MeSH paradigms

Number of articles/sources meeting criteria for further review: Of the total of approximately 1000 titles reviewed from the various databases, 63 abstracts were reviewed leading to final review of 5 articles, none of which were found to either directly address the PICO question or to have inferential implication from data collected for the study question.

### Summary of evidence

#### Evidence Supporting Clinical Question

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Level of evidence

A = Mortality  C = Infection  E = Other outcome
B = Pain  D = Function  *Italics = Animal studies*

### Evidence Neutral to Clinical Question

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Level of evidence

A = Mortality  C = Infection  E = Other outcome
B = Pain  D = Function  *Italics = Animal studies*
Evidence Opposing Clinical Question*

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**Level of evidence**

Outcomes
A = Mortality  C = Infection  E = Other outcome
B = Pain  D = Function

*Italicics = Animal studies*

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**REVIEWER’S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:** (please include implementation considerations including at a minimum training, environment and availability):

No studies were found to have dealt with the PICO question. Many articles going back as far as the early 1900s referred to the orthopedic principle of stabilizing a fracture to avoid internal tissue damage and pain until skilled reduction could be accomplished except in the case of apparent compromise of distal circulation, in which case straightening to the point when pulses return with stabilization in that position and continued monitoring of pulses until definitive treatment is reached is recommended. The current literature review incorporated the presumption of reasonably accessible definitive care. Care may need to be modified in unusual situations where arrival at definitive care is delayed since there is evidence that marked delay of several days prior to reduction of a long bone fracture is associated with an increased rate of complications.1

Literature from the early part of the 20th century regarding treatment of femur fractures refers to war-time experiences in the First World War, the Crimean War, the British military action in South Africa with reference to decreased complications associated with early battlefield realignment and stabilization, though these reports are not studies.2,3

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**Citation List**

*(None)*

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**References**

