**Clinical question.**
In which circumstances are the application of a tourniquet appropriate?

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

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

**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).**

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<td>Cochrane</td>
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<td>AHA database</td>
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**State inclusion and exclusion criteria**
Human and animal studies were included that were English language that included clinical trials, meta-analysis, randomized control trials, or comparative studies

Numerous consensus and isolated case reports were excluded.

**Number of articles/sources meeting criteria for further review:**
## Summary of evidence

### Evidence Supporting Clinical Question

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### Level of evidence

- **A** = Return of spontaneous circulation
- **B** = Survival of event
- **C** = Survival to hospital discharge
- **D** = Intact neurological survival
- **E** = Other endpoint
- **Italics** = Animal studies
## Evidence Neutral to Clinical question

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### Level of evidence

A = Return of spontaneous circulation  
B = Survival of event  
C = Survival to hospital discharge  
D = Intact neurological survival  
E = Other endpoint  

*Italics = Animal studies*

## Evidence Opposing Clinical Question

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### Level of evidence

A = Return of spontaneous circulation  
B = Survival of event  
C = Survival to hospital discharge  
D = Intact neurological survival  
E = Other endpoint  

*Italics = Animal studies*
The majority of the reports involve the use in the treatment of extremity trauma in combat causalities. The majority of the published literature in civilian trauma is nothing more than anecdotal reports and opinion. Reports from recent military conflicts demonstrate improved hemorrhage control and reduced extremity associated deaths. These series involve combat injuries treated in austere conditions. No studies could be located that evaluated and identified specific indications based on either anatomical injury or physiology that warranted tourniquet application for extremity trauma.

- Tourniquet use was not deemed responsible for subsequent amputation in severely mangled extremities. (Beekley AC, Sebesta JA et al. 2008)
- Retrospective series demonstrated that prehospital tourniquet use was associated with improved hemorrhage control. (Beekley AC, Sebesta JA et al. 2008)
- A more liberal use of tourniquet use in the prehospital treatment of combat injuries could reduce 57% of severe extremity injury related deaths. (Beekley AC, Sebesta JA et al. 2008)
- No early adverse outcomes determined from use of prehospital tourniquet for severe extremity trauma (Beekley AC, Sebesta JA et al. 2008)
- The rate of nerve palsy following tourniquet use is low (approximately 2%) (Kragh JF Jr, Walters TJ et al. 2008)
- There was no statistical difference in the need for fasciotomies with tourniquet time less than and greater than 2 hours(Kragh JF Jr, Walters TJ et al. 2008)
- Not all commercially produced tourniquets can self-applied effectively (Walters TJ, Wenke JC et al. 2005).
- A case has been reported in the literature with use of a tourniquet for 16 hours without residual effects. (Kragh JF Jr, Baer DG et al. 2007)
- Not all commercial tourniquets were equally effective when self-applied in an experimental setting.(King RB, Filips D et al. 2006)
- Application of pressure points did not eliminate distal arterial flow that was easily eliminated with various forms of tourniquet applications (Swan K G. Jr, Wright DS, et al. 2009)

Acknowledgements:

**Citation List**


Notes: the use of tourniquets were not responsible for subsequent amputation and it was estimated that liberal use of tourniquets could have reduced death from the combat injuries in this series by 57%. The authors did not determine any adverse events associate with tourniquet use in this series.

LOE: 3

Quality: fair

Notes: In this rat model of tourniquet use in hypotensive animals did not see an increase in ischemia reperfusion following 4 hours of tourniquet use in hypotensive, hemorrhage rats.

LOE: 5
Quality: good


LOE: 2
Quality: fair

Notes: approximately 2% patients experienced a transient nerve palsy and another 2% had palsies at the level of the wound. There was no association made between tourniquet time and morbidity. Furthermore, there was no statistical difference in the need for fasciotomies with tourniquet time less than and greater than 2 hours.


LOE: 4
Quality: poor

Notes: general retrospective case series, showing that tourniquets could be applied with reasonable effectiveness in a short period of time.


LOE: 3
Quality: fair


LOE: 5
Quality: good


LOE: 4
Quality: poor

LOE:4  
Quality: poor


LOE:2  
Quality: fair


LOE:4  
Quality: poor


LOE:2  
Quality: poor


LOE:4  
Quality: poor


LOE:4  
Quality: poor