

Life *OR* Limb...uh... let's save both !

Tourniquet Application

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Important Clarification

- Arterial Tourniquet

VS.

- Venous Tourniquet



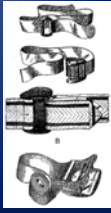

Tourniquet History




- 6th century BC: some tourniquet references
- 1st century AD Rome: some use for hemorrhage
- 2nd century AD Rome: Galen spoke against it
- 16th century Prussia: used in amputation surgery
- 16th century: windlass first described
- 1674: Morel first clear use of battlefield tourniquet
- 1718: Petit coined the term "tourniquet"
- Late 1700s: discussion of preventable deaths and battlefield use of tourniquets
- Documented use in the US Civil War
- Tourniquets largely unchanged until the 1990s

Why are we so scared of them?

- Significant use during WWI and WWII
 - Often improper use, leading to morbidities
 - Limited / inadequate training
 - Issued tourniquet was ineffective
 - Prolonged transport times
 - Medical authorities began to discourage their use but seemed to recognize their utility
- Sir Reginald Watson-Jones
 - Abolished first aid use of tourniquets



Tourniquet Myth #1

If you put a tourniquet on, the patient will lose their limb.

FALSE

Tourniquet Myth #1

Kragh, et al. *J Emerg Med.* 2011.

- 499 pts, 651 limbs, 862 TKs
- Median TK time 1 hr; mean time 1.3 hrs
- 1.5-1.7% Nerve Palsy (mostly <24 hrs)
- No limbs lost due to TK use
- 89% survival with field application; 78% in hospital
- 90% survival if applied before shock; 18% after
- Limb shortening and fasciotomy only morbidities associated with TK time (> 2 hours)



Tourniquet Myth #1

Clasper. *JR Army Med Corps*

- British matched cohort study
- Iraq and Afghanistan theaters
- 22 TK applications
- 3 amputations in each group
- Deep infection only morbidity associated with TKs

Lakstein. *J Trauma*. 2003

- 110 Israeli prehospital battlefield TKs
- 109 – 187 minutes of TK time
- No amputations due to TK use

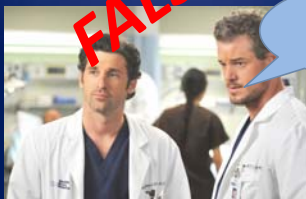
Tourniquet Myth #2

Tourniquets are not effective
below the elbow and knee.

FALSE

Tourniquet Myth #3

Once a tourniquet is put on, **ONLY**
a physician can take it off.



What?

But, I'm not being shot at...usually

Indications for civilian EMS tourniquet use:

- Failure to control hemorrhage with direct pressure
- Active resuscitation with hemorrhage
- Combative patient with hemorrhage
- Extrication with hemorrhage
- Multiple sources of hemorrhage
- Mass casualty incident

Combat Application Tourniquet





Place it around the limb



1-2 inches proximal to the wound
Not on a joint

For the lower extremity, use both
holes in the friction buckle



Tighten as much as possible



Secure all hook-and-loop fastener
band back on itself

Twist windlass until bright red bleeding stops; direction doesn't matter



Usually takes 2-5 turns

Secure windlass under windlass clip



Reassess for hemorrhage control

Route any remaining strap through the clips and over the windlass



Further secure the windlass using the securing strap across the clips



Write the time of application on the securing strap

What if the bleeding doesn't stop after 5 or 6 turns of the windlass?

- Apply a second TK, just proximal to the first.
- This is most commonly required for thigh use.

What if I need more TKs than I have?

- BP cuffs work well (consider adding some tape), must monitor for leak (it will happen)
- Well-made improvised TKs do work (Kerlix or triangle bandages are best)

Can I take the TK off?

- Yes, if the circumstances necessitating its use have been removed

Pearls and Pitfalls

- Must be > 1 inch wide
- Do not apply on a joint
- Apply approx. 1-2 inches above the wound
- Tighten well before using windlass (for CAT)
- Don't work for torso, head, neck, axilla, groin
- Record application time
- Ensure visibility and security
- Tell the next provider