FROM HERE, HEALTH

FACULTY OF PRE-HOSPITAL CARE
THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH

Position statement on the application of Tourniquets

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Tourniquet use has been re-introduced into civilian practice, influenced by recent military experiences. It could be argued that in a civilian setting, catastrophic external haemorrhage from a limb is rare and most bleeds can be controlled with direct pressure successfully. However, there remains a place for the use of a tourniquet and these include events such as stabbings, firearms incidents, industrial accidents and incidents in remote areas.

Tourniquets should only be used as a last resort after other stepped measures have failed except in complete traumatic amputation where a tourniquet should always be applied.

It must be reiterated that tourniquets must be used correctly or not at all.
An inappropriately used tourniquet can be harmful1 and an incorrectly applied tourniquet will cause increased bleeding from distal soft tissue injuries and damaged arteries if there is occlusion of the lower pressure venous outflow, but inadequate occlusion of arterial blood flow i.e. the tourniquet is not tight enough2.

Arterial tourniquets exist in either improvised or custom-built forms, and use a number of different techniques in order to apply a band of pressure over a body-part with the aim of arresting haemorrhage. The design of any tourniquet improvised or otherwise requires a broad band to provide adequate compression3.

Application of the tourniquet

In the past, the advice has been to apply the tourniquet to a single bone only as it was thought to be more effective. This doctrine is believed to have arisen from porcine animal haemorrhage models. The model neither reflects human anatomy, nor the way a limb mangled by ballistic trauma will respond to circumferential compression4. Significant military experience has shown that applying a tourniquet as distally as possible above the wound is effective.

It is recommended that the tourniquet is:

Certain scenarios such as where self-administration, a non-permissive environment such as where there may be entrapment or access to the limb is limited, the tourniquet may need to be placed more proximally up the limb. In these cases, review of the placement should be considered when possible with a view to re applying a tourniquet closer to the wound prior to releasing the initial higher placed one to ensure haemorrhage control is maintained.

The tourniquet should be left in place, with the time of application noted, until access to higher medical capability is available.

Steps	Comments
1.Applied as rapidly as possible	
2.Applied directly to the skin	To prevent slippage
3.Placed as distally as possible above the wound	Including over the lower leg and the forearm, to preserve the maximum amount of salvageable tissue

4.Applied tightly enough to arrest haemorrhage	• Effectiveness of the tourniquet will be determined by the cessation of external haemorrhage and not by the presence or absence of a distal pulse • If it is ineffective the tourniquet should be tightened or a repositioned • The application of a second tourniquet (applied above the first) may be required • Slight oozing at the wound site may occur due to some blood flow from the exposed medullary bone end

1. Deloughry JL, Griffiths R. Arterial tourniquets Contin Educ Anaesth Crit Care Pain (2009) 9 (2): 56-60

2. Starnes B W, Beekley A C, Sebesta J A. et al Extremity vascular injuries on the battlefield: tips for surgeons deploying to war. J Trauma 200660432–442

3. Wall, P. L., Duevel, D. C., Hassan, M. B., Welander, J. D., Sahr, S. M., & Buising, C. M. (2013). Tourniquets and occlusion: the pressure of design. Military Medicine, 178(5), 578–587.

4. Brodie S, Hodgetts TJ, Ollerton J, et al. Tourniquet Use In Combat Trauma: UK Military Experience, JR Army Med Corps 153(4): 310-313