

DOGMA DETECTIVES Case # 02-17-13-01: TOURNIQUET TROUBLE

When the Emergency War Surgery handbook 2nd Ed. was released in 1988, it listed tourniquets as only a last resort, citing risk of limb loss. Reports of tourniquet use exist in the 16th century medical literature. During the Civil War, tourniquets were issued to Union Soldiers, but many suffered limb amputations and death from extremity trauma. Tourniquets were employed in all the battles from WWI up through Vietnam. In the 90s, Army Rangers employed tourniquets in the two day battle for the city of Mogadishu, and they have since gained favor for both military and civilian use since.

So what does the literature support? Are tourniquets beneficial or harmful? And what are the true risks of loss of limb, acidosis, or death directly related to the tourniquet itself?

Use of Tourniquets for first line control of severe bleeding is BENEFICIAL for all patients. The use of tourniquets to control major bleeding is absolutely life-saving and should be employed by all level of medical provider.

The body's blood supply is completely circulated throughout the body in about 2-3 minutes. Therefore, major hemorrhage has the potential to cause death faster than both anoxia (4-6 minutes) and tension pneumothorax (also about 4-6 minutes).

During the Civil War there were a number of factors that lead to the loss of limb and life from extremity injuries. The use of aseptic surgical technique was not readily accepted in the medical profession at the time, and often tourniquets were left on for days while soldiers were awaiting definitive medical care. During WWI through Vietnam, tourniquets were employed and found to be beneficial. In fact, survivability on the battlefield with the combination of tourniquets and rapid extrication (using helicopters) increased survivability to greater than 90% in the Vietnam War.

It is unclear why the 1988 field guide seemingly disregarded nearly 70 years of successful tourniquet use by the military and again mentioned the risk of limb loss with tourniquet use. Orthopedic surgeons will often tourniquet limbs during surgeries and only start to consider loosening the tourniquet after 2 continuous hours of use (http://www.wheelessonline.com/ortho/extremity_tourniquets).

The experiences with tourniquets by the military since the 1993 Battle of Mogadishu have been universally positive, and the 2004 revision to the Emergency War Surgery handbook reflects this. The guide indicates that tourniquets are beneficial as a primary modality of bleeding control. The manual notes that they do not require constant attention, allow first responders to care for others, and extend limited battlefield resources. There is still a mention that tourniquets left on greater than two hours could lead to limb loss, but it is clear that when saving a life, loss of limb is not the primary concern. This teaching is reflected by the major courses in pre-hospital trauma care (ITLS, PHTLS, TCCC).

Tourniquets should be carried by all pre-hospital and military providers and should be employed expeditiously in all cases of severe or major hemorrhage.

http://www.health.mil/Libraries/110808_TCCC_Course_Materials/0784-TCCC-Abstract-Kragh-Survival-with-Emerg-Tourniquets-Ann-Surg-2009.pdf

http://www.health.mil/Libraries/110808_TCCC_Course_Materials/0786-TCCC-Abstract-Kragh-Tourniquets-J-Trauma-2008.pdf