



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Hemorrhage Control and Resuscitation Evaluation of Junctional Hemorrhage Control Devices

Junctional hemorrhage control devices are critical for controlling hemorrhage in high-level traumatic injuries. As new junctional tourniquet designs emerge, it is critical to assess their safety and efficacy in environmental conditions that exist at the point of care and en-route during patient transport. Researchers at the Naval Medical Research Unit San Antonio (NAMRU-SA), sponsored by DHA's Research, Development, and Acquisitions Directorate and MCSC, are evaluating the performance of four different commercially available, FDA-approved truncal/junctional hemorrhage control devices which aim to occlude blood flow at pressure points located near the torso, inguinal, and axilla regions. An initial phase of the study evaluated the performance of various junctional tourniquet designs during applications to a Multiple Amputation Trauma Trainer® in simulated operational conditions. Device stability during transfer and the effect of altitude on the devices (as some are pneumatic) were examined. The junctional tourniquets designs that employed pneumatic pressure applicators provided greater stability than the purely mechanical designs during simulated patient transfers; however, the amount of pressure exerted by the pneumatic devices varied with altitude. Additional testing evaluating the tourniquets during extended application times and during simulated patient transport is underway using a SynDaver™ Synthetic Human, a human tissue equivalent mannequin model with a circulatory system and heat pump. Performance metrics include application times, contact pressures, and most importantly, whether the device is able to achieve and maintain occlusion. The results from this study will be used to inform decision-making to best equip the US Service Member.