**Conclusions:** Celox was superior to Woundstat with respect to composite endpoints in control of hemorrhage in limited access combat trauma wounds

**Keywords:** combat; hemorrhage; hemostatic agent; swine; trauma
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## Does the Time to Administer Lidocaine-Propofol Admixtures Affect Induction Times?

*Gregory G. Nezat;[1] Mark J. Brownfield;[1] Paul Gerard J. Scott;[1] Michael J. Spagna;[1] Raymond J. Hood;[1] Joseph E. Pellegrini[2]*
1. Naval Medical Center Portsmouth, Portsmouth, Virginia
2. University of Maryland

**Purpose:** Propofol is a commonly used induction agent for rapidly securing the airway for emergency surgery and is routinely combined with lidocaine to reduce pain upon injection. The purpose of this study was to determine if a difference exists between groups of patients administered a lidocaine-propofol admixture prepared immediately before induction (control group) as compared to one prepared 60–180 minutes prior to induction (experimental group).

**Methods:** This prospective, randomized investigation enrolled 125 patients scheduled to undergo a procedure requiring general anesthesia. They were randomized into either the control or experimental group. All subjects underwent induction of general anesthesia with a 2 mg/kg propofol and 0.2 mg/kg lidocaine admixture. Time to induction was measured from the time of bolus injection to the time subjects dropped a syringe held between their thumb and forefinger during administration of the admixture.

**Results:** A total of 116 subjects were included in the final results. No significant differences in demographic variables or other measured variables between groups except in time to syringe drop. Time to syringe drop was noted as 29.7 ±11.9 seconds in the control group and 43.8 ±22.1 seconds in the experimental group. ($p$ <0.001).

**Conclusions:** Lidocaine-propofol admixtures should be mixed immediately before use in order to reduce the risk of awareness under anesthesia during rapid sequence induction for emergency surgery.

**Keywords:** anesthesia; induction time; lidocaine; propofol
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## Detection of Intracranial Hypertension: Utilization of a Portable Utrasound System

*Major A. Montcriol; Major B. Prunet; Major Y. Asencio; Col. E. Kaiser*
Sainte Anne Military Teaching Hospital-Toulon-France

**Introduction:** Traumatic brain injury (TBI) is one of the first causes of death in overseas operations. Management of TBI requires intracranial pressure (ICP) monitoring, but that is not always available. A protocol for detection of intracranial hypertension was developed using the ultrasound system dedicated to cardiac or abdominal examination in forward surgical units.

**Methods:** Transcranial echodoppler (TCED) measurements were performed with the SonoSite TITAN® and a 2 MHz probe dedicated to cardiac examination.

The first step consisted of 2D-echographic identification of the turcica sella through the trans-temporal window at a depth of 60–70 mm. Secondly, color Doppler was used to detect the middle cerebral artery (MCA). Then, a pulsed-wave Doppler acquisition was realized on the MCA.

**Results:** Mean, systolic, and diastolic values of blood flow velocities (Vm, Vs, Vd, respectively, in cm/s) and the pulsatility index (PI) [(Vs-Vd)/Vm] were calculated. Measurements were repeated twice.

Transcranial echodoppler was considered pathological when two out of three measured values were outside the following limits: Vm <30 cm/s, Vd <20 cm/s, PI >1.4.

These easily reproducible measurements could be used to detect on admission patients at risk for secondary neurological deterioration and to guide their neurologic treatment.

**Conclusions:** This method will be taught to all military physicians able to use SonoSite TITAN® ultrasound devices.

**Keywords:** intercranial hypertension; traumatic brain injury; ultrasound
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## Comparison of Two Granular Hemostatic Agents in a New Lethal Model of Extremity Arterial Hemorrhage in Swine

*Maj. Y. Asencio, MD;[1] Maj. A. Montcriol, MD;[1] Maj J. Bordes, MD;[1] Maj. B. Prunet,MD;[1] Maj. N. Prat, MD;[2] Col. Kaiser, MD, PhD[1]*
1. Sainte Anne Military Teaching Hospital-Toulon, France
2. Experimental Physiology and Surgical Unit-Marseille, France

**Introduction:** Exsanguinating extremity wounds remains the primary source of battlefield mortality. Significant research recently has been undertaken in developing new hemostatic dressings that can stop severe compressible bleeding rapidly. The new granular/powders hemostatic CeloxTM (CX) and WoundstatTM (WS) were studied in a new severe hemorrhagic model in the groin area of anesthetized pigs.

**Methods:** Twenty-one animals were utilized, with seven in each group. After 15 seconds of free bleeding, WS, CX, or standard gauze (SD) were placed on the wound. Continual calibrated pressure was applied upon the dressings starting at 200 mmHg, and was decreased slowly by 5 mmHg every 5 minutes. If bleeding occurred, the external pressure was increased by 5 mmHg. The total pressure quantity (KNS) to obtain definitive hemostasis was expressed in KNewton/Seconds. Blood loss (BL), heart rate (HR) and arterial blood pressure (ASP) were recorded continuously.

**Results:** There were no differences between the SD, CX, and WS group for the average hemodynamic parameters (ASP, FC). Time when bleeding stopped (BT) was 15.5 min for WS, 16.5 min for CX, 29 min ($p$ <0.05) for SD. Blood loss (ml/Kg) was 6 for WS, 5.9 for CX and 13.1 ($p$ <0.05) for SD. Total pressure quantity was 3.1 for WS, 3.5 for CX and 5.1 ($p$ <0.05) for SD.

**Conclusions:** WoundstatTM and CX obtained better results than SD in decreasing the BL and the compression task to obtain a definitive hemostasis in a lethal hemorrhagic wound.

**Keywords:** hemostatic dressing; uncontrolled hemorrhage
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