## K24 Effect of Torso Dart Position and Cocaine Intoxication on Taser® Induction of Ventricular Fibrillation

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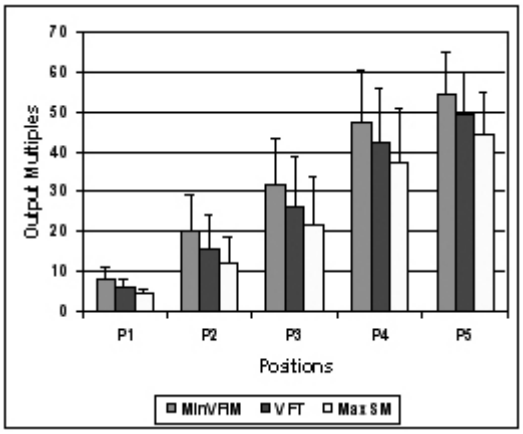
After attending this presentation, attendees will learn about torso dart positions as they relate to the propensity to induce ventricular fibrillation (VF) by neuromuscular stun guns as well as the effects of cocaine on VF induction thresholds by stun guns.

This presentation will impact the forensic community and/or humanity by assessing the likelihood that stun guns contribute to induction of ventricular fibrillation in such subjects.

Neuromuscular stun guns are increasingly used by law enforcement to restrain uncooperative and combative subjects being taken into custody. Multiple deaths have been reportedly associated with the use of stun guns. This study aimed to assess the threshold for ventricular fibrillation (VF) induction using the Taser® X26 waveform with darts positioned at various common torso locations in an anesthetized pig model. The effect of cocaine on the VF induction thresholds was also investigated.

Thirteen pigs (34±7 kg) were utilized in the initial study to assess dart locations on VF induction thresholds. Dart positions on the torso were as follows: 1) Sternal notch (SN)to cardiac apex 2) SN to supraumbilical area 3) SN to infraumbilical area 4) side to side on the chest 5) superior to inferior region of the dorsum. Increased outputs of the Taser® X26 waveform was delivered by increasing the capacitance of the stored charge in a custom built device. VF thresholds were determined by a stepwise increasing output until VF was induced by a multiple of the baseline capacitance. VF thresholds were also measured in five pigs after infusion of cocaine at 8 mg/kg over 30 minutes.

Results are shown in the following figure.




MinVFIM = minimum capacitance multiple inducing VF
Max SM = maximum multiple not inducing VF on 3 consecutive applications
VFT (VF threshold) = average of MinVFIM and MaxSM P1-P5 = Positions 1 through 5

Cocaine consistently increased MinVFIM, MaxSM and VFT at all positions by 50% to 200%. Intracardiac electrograms demonstrated that VF induction was related to rapid ventricular capture by the Taser® pulses.

Conclusions: NMI output equivalent to standard Taser® X26 did not induce VF in any pig. Position of the darts significantly affects propensity for induction of VF being most sensitive in the precordial position. Cocaine increased VFT probably through its sodium channel blocking properties.

**Neuromuscular Stun Guns, Ventricular Fibrillation, Cocaine**

 ** Presenting Author*