

**392 Effects of MK63 Stun Device
Discharges on Neuromuscular Structure
and Function**

Robert Walter, Daniel Valentino, Andrew Dennis, Kimberly Nagy, Faran Bokhari, Dorion Wiley, Kimberly Joseph, Azher Merchant
Cook County Trauma Unit and Rush University Medical Center

Background: Stun guns or electromuscular incapacitation devices (EIDs) generate between 20,000 and 900,000 volts and can be discharged continuously for >15 minutes. Worldwide, over 600,000 individuals have been exposed to discharges from the most common EID. EIDs are being used increasingly despite increasing associated morbidity and deaths. We hypothesized that the MK63 EID would have injurious effects on neuromuscular function and structure which would worsen with increasing discharge length.

Methods: Anesthetized Yucatan mini-pigs (17 experimentals, 3 shams) were exposed to discharges from an EID (MK63, Aegis Indus., Monterey, CA) over the femoral nerve on the hind limb for 20, 40, or 80 sec. EKGs and EMGs were obtained pre- and post-discharge at 5, 15, 30, 60 min, 24, 48, 72 hrs. Tissue biopsies were obtained bilaterally at 72 hrs post-discharge. Using one-way ANOVA with Tukey subtests, P values < 0.05 were considered significant.

Results: No cardiac dysrhythmias or sudden deaths were seen in any animals at any time exposure level. No biochemical evidence of skeletal muscle damage or changes in compound muscle action potentials (CMAP) were seen. No evidence of conduction block, conduction slowing, or axonal loss was seen by EMG. M-wave latency, amplitude and area were not significantly affected by EID discharge compared to pre-discharge controls. F-wave latency, a sensitive indicator of retrograde nerve conduction and function, was not significantly affected by discharges. No significant histological changes were seen at any exposure level or time point in skeletal muscle or peripheral nerve biopsies although mild skin inflammation was evident.

Conclusions: No clinically significant changes were seen in any of the physiologic parameters measured here at any time. In swine, even lengthy MK63 discharges did not induce injury in cardiac or skeletal muscle or peripheral nerve as seen using ECG, EMG, and routine histology.