



D38 Pilot Comparison of Conducted Electrical Weapon Effectiveness: Old vs. New Technology

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The goal of this presentation is to discuss and view new generation Conducted Electrical Weapons (CEW) and their effectiveness in the field by comparing them to older generation technology. The audience will understand how effective each of these technologies is when compared to each other.

This presentation will impact the forensic science community by aiding in event reconstruction and in understanding the capabilities of these devices. Event understanding and reconstruction of events involving newer technology will remain accurate by comparing effectiveness to familiar and known (older) technology effectiveness.

The CEW is a popular law enforcement tool used in the control and restraint of potentially violent persons. The TASER X26 CEW, in service since 2003, is the most widely used CEW in society, and is considered older generation technology. The TASER X2 CEW has been recently released for service, is expected to replace the X26 over the next several years, and is considered new generation CEW technology. In general, the X2 is less familiar to most forensic personnel.

The X2 is different than the X26. In addition to a multi-shot capability, it has redesigned electrical waveform and output characteristics when compared to the X26. This pilot study describes an initial head-to-head comparison of the effectiveness of these devices in stopping a motivated person when compared to each other. This information may be important forensically when evaluating or reconstructing a situation where new generation CEW technology has been used.

This study presentation should provide attendees with an understanding of how effective each of these CEWs is in controlling/restraining a motivated person. It will also help attendees to understand how effective the CEWs are when compared to each other. This information should prove to be helpful to the forensic, legal, and investigative community when reconstruction of events must be made.

Four human volunteers were recruited and had metal TASER XP probe pairs manually placed to a depth of 13 mm. Each volunteer had two pairs of probes emplaced (one pair on the right and one pair on the left of the abdominal/inguinal region). Superior probe placement was at the costal margin, five inches lateral of midline (as guided by the umbilicus). The Inferior probe was placed vertically inferior at predetermined spread distances. These distances were 6, 9, 12, and 16 inches apart (15.2-40.6 cm). Each volunteer was given the goal of holding a rubber knife and slashing a suspended dummy 10 feet (3.05 meters) away during the CEW exposure. As a means of motivation, they were told that the CEW exposure would continue until they reached their goal (in reality, the CEW exposure was terminated when the operator determined that no further forward progress was being made). Each volunteer received two CEW exposures, one each from an X26 and an X2 factory standard CEW. The order of the exposures was randomized. There was an approximate two-minute rest period between the two exposures. All exposures were recorded by a high-speed, high-resolution video camera. The videos were later reviewed and scored for effectiveness by a panel of physician and law enforcement experts.

No subjects were excluded and all completed the testing protocol for a total of eight exposures (four pairs) for evaluation. The review experts evaluated each exposure for degree of upper extremity effect, lower extremity effect, total body incapacitation, and whether or not they were able to reach their goal. The exposure reviews were then descriptively compared independently for probe spread distances and then compared between devices.

In this pilot study, results show that there was no discernible, descriptive difference in effectiveness between the TASER X26 and the X2 CEWs when compared in head-to-head fashion. Based on this, end-



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users and forensic investigators should expect similar performance characteristics during use and in event reconstruction. As new generation CEW technology becomes more popular, it may be important to increase the scope of this research for validation.

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