



## Pathology Biology Section – 2007

### G54 Potential Errors in Autopsy Reports of Custodial Deaths Temporally Associated With Electronic Control Devices: A Cardiovascular Perspective

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After attending this presentation, attendees will have a better understanding of Electronic Control Devices, such as the TASER® device, and how to better perform an autopsy in such cases.

This presentation will impact the forensic community and/or humanity by demonstrating more accurate autopsies where an Electronic Control Device was associated with a death.

**Introduction:** Sudden, in-custody death (SICD) events are alarming phenomena that occur numerous times per year in this country. With increasing usage of electronic control devices (ECD), such as TASER® brand devices by law enforcement, the number of SICD events that are temporally related to ECD applications is growing. The autopsy in such a case presents a diagnostic challenge to the medical examiner, as there are no postmortem tests available to detect past electrical applications.

As ECD technology is relatively new, medical examiners may not be fully aware of what these devices are and are not capable of and may, therefore, be making errors in diagnostic judgment. This study analyzed the probable error rate in assigned causes of death based on a convenience sample population.

**Methods:** A press search for the years 2001-2005 for cases of an SICD with a temporal ECD association was undertaken and the autopsy reports obtained.

Sudden death from electrical discharge is caused by the induction of ventricular fibrillation (VF) and generally follows this sequence: (1) pulse disappears immediately, (2) there is loss of physical strength for continued resistance, (3) collapse occurs within 5-20 seconds, (4) a VF rhythm is shown on a cardiac monitor, and (5) immediate defibrillation is usually successful. Any material failure to appreciate the above facts was scored as an error.

Other errors were counted if the report reflected hypotheses not supported by known literature. These included: blaming the ECD for cardiac physical changes, inclusion of a publicity sensitive safe comment (e.g., “we were unable to eliminate the role” of the ECD), assuming prolonged ECD applications are more dangerous than other restraint techniques, claiming that ECDs impair breathing, presumption of a lethal synergy between stimulant drugs and the ECD, use of the ECD in the “drive stun” mode only since this involves current passing between two very close electrodes and does not create any major body mass involvement. Finally, the use of the metaphorical “last straw” was scored as an error.

**Results:** There were 176 SICD events reported over the 60 month period with a temporal ECD association. Twenty-Seven cases where the autopsy reports listed the ECD as a contributory or as an “unknown” factor. As expected, the rate of such reports appears to be growing at 2.6 per year ( $r^2=.74$ ,  $p = .06$ ). Autopsy reports were reviewed for these cases and errors were tabulated. The decedents were all male with mean age  $35.6 \pm 10.7$  years (median = 32) which is consistent with recently reported SICD data.<sup>1</sup> A mean of  $3.1 \pm 1.2$  scored errors per report with a range of 1-6. This rate was very stable across the study period. A sobering finding was the rate at which “last straw” was mentioned as a linkage in lieu of a scientific mechanism. Scored errors are listed in the following table:

Probable Error in Citing the ECD	N
Time to collapse > 1 minute	21
Continued resistance after ECD application	14
Rhythm other than VF	11
Publicity sensitive comments	9
Failure of immediate defibrillation	7
Drive stun mode	6
Assumed drug-ECD electrocution synergy	6
Discharge duration or parity	5
“Last straw” metaphor as a mechanism	4



## Pathology Biology Section – 2007

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Cardiac damage ascribed to ECD	3
Assumed ventilation impairment	2

**Conclusions:** While uncommon, autopsy reports involving electronic control devices do appear several times per year with material errors in the area of cardiogenic etiology. The results of this study suggest that medical examiners need to familiarize themselves with the time and causation elements of electrocution, ventricular fibrillation, and ECD technology to avoid this in the future.

**Reference:**

- <sup>1</sup> Ho JD, Reardon RF, and WG Heegaard. Deaths in police custody: an eight month surveillance study. *Annals Emerg Med*, 2005;46 (suppl):S94.

**Electronic Control Devices, TASER®, Autopsy**