Potential Autopsy Errors With In-Custody-Deaths: The Ronald Hasse Case Study

Chicago, Illinois, police officers and paramedics were called to a high-rise apartment building where Mr. Ronald Hasse was naked and talking to aliens on his cellular telephone. Police officers used a TASER® X26 electronic control device (ECD), to attempt to get Mr. Hasse under control. After application of the TASER ECD Mr. Hasse was then handcuffed and helped to climb into the paramedics stair-chair. Paramedics then verified Mr. Hasse's pulse and respiration. Police and paramedics agree that Mr. Hasse was alert and breathing — with eyes open — as he was wheeled into the elevator.

At the ground level of the high-rise — 8 minutes after the ECD applications — Mr. Hasse was unresponsive and aggressive resuscitation therapy was given unsuccessfully. Mr. Hasse was pronounced deceased in the hospital about 60 minutes later. Toxicology later showed a blood methamphetamine level of 0.55 micrograms per milliliter (µg/ml).

The local deputy medical examiner (DME) blamed the TASER ECD as the primary cause of Mr. Hasse's death in his autopsy report stating that the ECD electrocuted Hasse. The DME achieved nation-wide publicity for being the first medical examiner to name a TASER ECD as being the primary cause of a person's death, giving many media interviews. From those interviews it appeared that the DME based his conclusions on unsupported speculation that long ECD applications could cause a fatal cardiac ventricular fibrillation (VF) and that there was some unspecified synergy between a methamphetamaine overdose and the ECD application. The DME further stated that he relied on the opinion of a Mr. James Ruggieri who had briefly publicized himself as a TASER ECD expert while claiming that the devices had a 50% fatality rate. Mr. Ruggieri is a high school drop out with no engineering degree who later recanted his erroneous claims.

The DME also reversed the sequence of TASER ECD discharges by stating that the second discharge was the longer one, which is the opposite of the facts. This is material as The DME found the longer discharge to be the cause of Mr. Hasse's death.

Material errors in this autopsy include: (1) blaming the ECD when the subject had normal pulse and respiration after the application as the electrical induction of VF causes loss of both within seconds, (2) assuming that a last longer ECD application increased the risk of VF induction, (3) reversing the sequence of the long and short applications, (4) relying on an unsupported speculation of a dysynergy between electrical current and methamphetamine, (4) ignoring the 8 minute gap between the ECD application and the collapse, (5) ignoring the subject's alertness minutes after the ECD application, (6) ignoring the failure of defibrillation shocks, (7) ignoring the subject's weight which would put his VF induction requirement at 150 times the TASER X26 output, (8) relying on Ruggieri's erroneous claims as the basis for his opinion, and (9) failing to consider excited delirium when the subject had at least seven signs.

Two weeks later, the DME dropped the Ruggieri discredited theory of direct induction of VF, and moved to a new speculative theory of respiratory arrest that had no support at the time and now contradicts published human studies.

In an effort to assist Medical Examiners with the challenge of in-custody-death cases, TASER International will be providing detailed analyses of cases in which a TASER Electronic Control Device was used at some point in the restraint process. This is the first in a series.

Background

In the United States, about 300 people sadly die each year fighting and struggling with police during restraint procedures. These deaths include both arrests and attempts to control someone in order to give medical assistance. Studies have shown that electronic control devices (ECD), such as the TASER X26, were used during about 30% of in-custody-deaths in the United States. As more police departments adopt these weapons that percentage will increase while the total number of deaths should decrease.

Although ECDs are temporally associated with these deaths, medical examiners have only cited the device as the primary cause of death in four cases to date. Four cases (out of over 600,000 uses) would give the devices a death rate of 1 in 150,000, making a death far less likely than one's risk of being struck by lightning (1 in 3000). And, even those three cases are suspect. In the instant case, the individual had his pulse and respiration verified by Chicago paramedics after the ECD was used. He later died with a lethal level of methamphetamine in his system. The medical examiner still ruled the ECD as the primary cause of death even though that directly contradicted the paramedics' findings.

Problematically, medical examiners are trained to recognize mechanical trauma and find toxic substances in the body. Since electrical current does not linger or accumulate in the body, these examiners sometimes decide to err on the side of including the TASER devices even though they have no explanation for how it could kill or contribute to someone's death. But as more data and published studies come out, medical examiners will be able to make more accurate judgments about the causes of death.

Electrocution

The electrical induction of ventricular fibrillation (VF) has recently become one of the best-studied causes of death. Paradoxically, this is due to the implantation of lifesaving implantable cardioverter defibrillators (ICDs) about 500 times per day when a cardiac electrophysiologist (EP) will intentionally electrocute a patient.[1] The ICD will then recognize the ensuing VF and deliver a lifesaving shock thus verifying the ICD's proper function.[2,3]

From this experience of over 1,000,000 such intentional electrocutions, certain facts have been medically and scientifically established beyond any shadow of a doubt:

1. VF is either induced or not induced within 1-4 seconds.[1]
2. The cardiac pulse disappears immediately.
3. The patient loses consciousness within 5-15 seconds.
4. A defibrillation shock—either internal or external—restores a sinus rhythm 99.9% of the time.
5. There is no increased risk of a later VF since electrical current does not linger in the body as a poison or drug might.

These facts are appreciated by few newspaper reporters, as can be ascertained by "TASER-related deaths" headlines. Fortunately, the majority of medical examiners do understand these scientific facts as can be seen from the increasing sophistication of autopsies in the same cases. Unfortunately, a few earlier examiners—especially those who failed to consult with an EP—did not share this understanding.

This human experience is entirely consistent with seventy years of animal electrical safety studies and international and Underwriters Laboratories standards.

International Regulations on Long Duration Shocks:

Both the International Electrotechnical Commission (IEC)[2] and Underwriters Laboratories (UL)[3] regulations recognize that electrocution either happens in the first second (or two) or does not happen.[4] Currents that will not induce VF in one second will not induce VF in one minute as shown in Figure 1 taken from Chilbert p 496.

Figure 1 shows that the TASER ECDs are literally off the charts as their currents are too low to fall on the graph.

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[1] This must not be confused with the more complex process of using elaborate pulse sequences to induce a non-fibrillation tachycardia.

[2] http://www.iec.ch/

[3] http://www.ul.com/

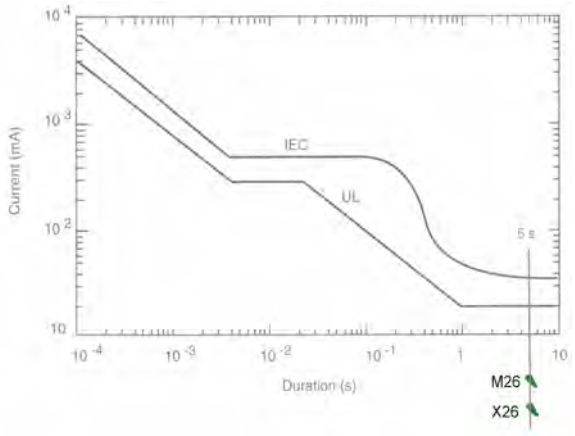

Figure 1. Short applications (less than 1 second) require increasing current levels to induce VF. The lines on this graph represent worst case scenarios with extremely low probabilities of VF and are less than 1/10 the current typically required to electrocute an adult human being.

Experimental Results on Long Duration Shocks:

Animal studies going back to the 1930s show that the risk of inducing VF does not build up (increase) after the first few seconds.[5] Figure 2 (taken from Antoni p 216) summarizes these studies. The time "t_2" is the time at which further applications of current do not increase the risk of inducing VF. These studies have found time t_2 to range from 0.8 to 4 seconds.[6-11]

A recent study in smaller pigs (110 lbs) looked at an extreme scenario by burying the TASER probes under the skin and placing a barb over the most sensitive part of the heart. With 15-second durations they were able to record some temporary and harmless effect on the heart. However, they saw the same effect 96% of the time with only a five second (s) application.[12] (Due to the differences in thoracic geometry this bilateral passage of current through the heart would be impossible in humans with the lung insulation.)

Based on the animal results above, Beigelmeier and Lee calculated that t_2 ranged from 2-5 seconds for humans due to the lower heartrate.[8,10] Swerdlow did a human study for electrical safety.[13] They applied current — directly to the inside of the heart — to cardiac patients who were receiving implantable cardioverter defibrillators (ICDs). Since their ICDs needed testing, they required the induction of VF, and thus this was an ethical study. They found that the threshold for AC current at one second duration was 474 ± 255 microamperes (μA) which went down to 217 ± 254 μA at five seconds. This was also consistent with the Beigelmeier and Lee model predicting a fall in threshold up to the first five seconds.

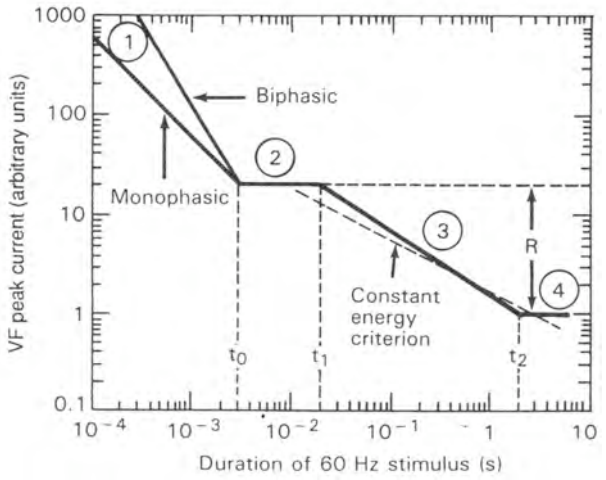

Figure 2. Summary of animal studies going back to 1936 show that at a certain time (t_2) the risk of electrocution does not increase with longer durations.

One human study found that connecting a nine volt (V) battery to the inside of the heart could induce VF within three seconds in the majority of patients.[14] An internal human study found that the current duration required to fibrillate (96% success rate) with a small steady direct current (DC) was 3.8 ± 1.4 seconds.[15]

The fact that electrocution takes only fractions of a second to a few seconds is also well recognized in pathology.[4]

Effects of Electrical Current On Breathing

Due to the routing of the phrenic nerves it is extremely difficult to electrically induce respiratory paralysis in the human. The phrenic nerve derives from the C3-C5 cervical plexus and the closest passage of phrenic nerves to the skin is just above the clavicle. The left and right phrenic nerves travel through the center of the thorax passing just on the margins of the heart on the way to enervate the left and right hemidiaphram muscles. They are surrounded by the highly insulative lungs throughout this passage, thus making them very insensitive to external electrical currents.

This has proved frustrating to researchers seeking to make a respiratory pacemaker following the success of external cardiac pacemakers. Researchers at Purdue University had some success in achieving electrical ventilation in dogs.[16] Probably due to the significantly different thoracic geometry,

[4]http://www.forensicnetbase.com/books/561/0072_PDF_C16.pdf.

these results did not carry over to human experiments and the human research attempts have been abandoned.

Even with current forced longitudinally through the whole thorax, the amount of current required to cause temporary respiratory arrest is on the order of the lethal level capable of inducing VF. A classic study found that it could require up to 20-50 mA to cause temporary respiratory arrest in dogs much smaller than humans.[17] This level of current is at least a decade removed from the 2.1 mA delivered by the TASER X26.

In addition, hundreds of videotapes of humans receiving TASER ECD applications demonstrate that respiration is maintained. Subjects are able to talk although the conversations were more filled with profanities than philosophy. In 2005 the United States Air force published a study, using a porcine model, concerned with issues of cardiac safety and rhabdomyolysis.[18,19] Despite prolonged ECD exposures (90-180 seconds total each) the study found no such cardiac or rhabdomyolysis concerns or problems. However, the authors made a casual note that the pigs appeared to stop breathing during their five second ECD exposure. This result could have been ignored as it was a non-instrumented and off-protocol observation, and if true was probably due to a short-term gasp reflex. In addition, the supine position is nonphysiological for swine and the anesthetic used (tiletamine-zolazepam) is known for compromising respiration.[20] The porcine study's relevance to human breathing could also be questioned due to the anatomical differences found to affect electroventilation decades earlier.

Nevertheless, Hennepin County Medical Center (Minneapolis, Minnesota) researchers decided to examine this respiration compromise possibility in human beings and instrumented volunteers with a Medical Graphics computerized spirometer.[21] To ensure that there would be no confusion from an initial gasp reflex, both 15 second continuous and 15 second interrupted ECD applications were used. Videotapes were also made to document chest movements and verbal responses.

Results demonstrated that—far from causing respiratory paralysis—the average tidal volume actually *increased with the long durations*. Videotapes documented that the ECD exposure volunteers were able to continue speaking although with the typical monosyllabic profanities.

In conclusion, the TASER ECDs cannot cause a respiratory arrest.

Drug Interactions

It is often assumed that methamphetamine increases the risk of electrically inducing VF (electrocution).

There are no scientific studies supporting this unfounded hypothesis and thus this assumption reflects uninformed speculation.

Studies of animals under the influence of another stimulant, cocaine, have shown that they actually are *harder* to electrocute.[22]

It is often assumed that any adrenergic stimulant must lower the electrical threshold for VF. This has been found true only for pure epinephrine and then only for the first few minutes. A few minutes after the epinephrine injection time the heart is actually less susceptible to electrocution.[23]

Cardiac electrophysiologists routinely use intravenous stimulants (such as isoproterenol) to help induce ventricular tachycardias in their electrophysiology lab. Hence, a typical first blush reaction is to assume that stimulants increase the risk from a TASER ECD or external electrical shock in general. However, stimulants — including isoproterenol — tend to actually increase the amount of electrical current required to induce arrhythmias.[24] The same is true with other stimulants such as phenylephrine.[25]

The apparent contradiction stems from the fact that electrophysiologists use strong enough pacing pulses (in the electrophysiology lab) directly delivered to a tiny spot on the inside of the heart. So, the decreased sensitivity to electrical stimulation from an adrenergic stimulant is irrelevant in the EP lab — it is trumped by the highly focused and concentrated current delivery. However, this same decreased sensitivity (from adrenergic stimulants) makes externally applied currents much safer. In general, stimulants actually increase the safety margin for externally applied electrical currents.

Chronological Analysis of the Case

Mr. Ronald Hasse, 54, was a convicted drug dealer, and chronic methamphetamine user, who had been incarcerated for four years in an Illinois prison for his dealing. He was apparently involved in a suspicious death and buried someone on an Indiana farm. His sister, Ms. Julie Hasse, turned him in to authorities. Mr. Hasse was then charged with "unlawful transportation of a body and failure to report a death."

On February 10, 2005, while awaiting a June 2005 trial on these Indiana charges, Mr. Hasse (carrying $657 in cash) went to apartment 2610 of

the Chicago Lakeview high-rise at 336 West Wellington to visit two acquaintances: Mr. Stephen Giardino and Leslie Miller. They called paramedics about 12h24 when Mr. Hasse refused to leave after displaying bizarre behavior and removing his clothing. They misrepresented his medical condition by telling the 911 emergency dispatch operator that Mr. Hasse was suffering from shortness of breath.

Paramedics Robin Alvarez and John Wodzicz, arrived and saw Mr. Hasse behaving irrationally sitting with his back against a wall in the hallway in an "upright fetal position." Giardino and Miller came out of their apartment and told the paramedics to get Mr. Hasse out of there as he was acting crazy and they thought he was on drugs. The paramedics saw Mr. Hasse holding a cell phone stating that he was talking with aliens and the paramedics should get the F.B.I. and the "real police." Paramedics called for additional assistance. Beat 2331 Chicago Police Department (CPD) Officer Lisa Eitel and Beat 2353 Officer George Marshall responded.

CPD Officers Eitel and Marshall arrived and found Mr. Hasse incoherent. He was screaming at them, "If you touch me, I'll kill you with my blood, if you come near me, I'll give you AIDS!" The officers requested the assistance of a supervisor with a TASER ECD. Chicago PD Sergeant Edward O'Reilly responded and found Mr. Hasse sitting in the hallway in front of the elevators. Firemen Philip Walsh and Karl Hull arrived at the same time. Sergeant O'Reilly then attempted to shake Mr. Hasse's hand to introduce himself. Mr. Hasse then pulled on Sergeant O'Reilly's hand and threatened to kill the Sergeant with his blood as he attempted to bite the Sergeant's arm. Sergeant O'Reilly then tried to calm Mr. Hasse down with numerous verbal attempts.

Sergeant O'Reilly then attempted to handcuff Mr. Hasse, while he (Mr. Hasse) continued to kick and scream that he would bite Sergeant O'Reilly and kill him with his blood. The officers were able to get one handcuff on Mr. Hasse who then broke away and swung the free end of the handcuff as a weapon against the officers.

A long TASER ECD application (57 seconds) was applied to subdue Mr. Hasse and allow handcuffing. This ended at 12h50:49. That was insufficient as Mr. Hasse quickly resumed his uncooperative behavior. A final five second application of the ECD was used to incapacitate Mr. Hasse, ending at 12h50:55. Mr. Hasse then cooperated with handcuffing and climbing into the ambulance stair chair.

Paramedics then examined Mr. Hasse and recorded a "+" for pulse and a "+" for respirations. (report attached) After an elevator was procured Mr. Hasse was placed in the elevator with his eyes open, alert and breathing. He was transported down to the street level.

When the elevator reached the ground floor about 12h59, Paramedic Alvarez noted that Mr. Hasse was going into cardiac arrest. Paramedics immediately administered cardiopulmonary resuscitation (CPR) and delivered aggressive therapy including five defibrillation shocks, epinephrine and atropine. The rhythm went from VF to PEA (pulseless electrical activity) and transcutaneous pacing was also attempted with no result. These treatments lasted until 13h05.

Mr. Hasse was then transported to Illinois Masonic Hospital and pronounced at 13h58 by Dr. Gillespie.

Giardino and Miller were arrested for obstruction and possession of cocaine. At 14h14, Asst. Deputy Superintendent Dennis Prieto began the in-custody-death investigation and went directly to the site of the altercation. At 15h50 the TASER X26 serial number X00-022238 was downloaded by Capt. Robert Quaid and the report printed.

What Killed Mr. Hasse?

Electrocution can be eliminated as a cause of Mr. Hasse's death for several fundamental scientific reasons.

1. Mr. Hasse continued to struggle after the first 57-second application of the TASER X26. Had he been electrocuted (*i.e.* put into VF) this would have been impossible. Dead men cannot fight.
2. After the second ECD application Mr. Hasse was able to cooperate and climb into the stair chair. This would also have been impossible had he been in VF. Dead men cannot help with anything.
3. Paramedics then noticed a normal pulse. Someone in VF has absolutely no pulse.
4. Paramedics noted normal respiration after this last TASER ECD application. Someone in VF will stop breathing within seconds.
5. Mr. Hasse did not become unresponsive until near the end of his elevator transport to street level, which was 8 minutes after the second TASER ECD application. As is very well understood, VF produces total

collapse after five to fifteen seconds, not minutes.

6. The fact that five defibrillation shocks failed to convert Mr. Hasse is strong confirmation that he did not have electrically induced VF.
7. The mean current required to fibrillate a mammal is given by 28.5 milliamperes (mA) + 1.67 W where W is the person's weight in pounds (lb).[26] For Mr. Hasse's 180 lb weight this current is 329 mA. *This is 150 times the TASER X26 current of 2.1 mA.*
8. Numerous animal and human studies have demonstrated that TASER ECD pulses are incapable of inducing VF.

However, Mr. Hasse's history and signs read like a textbook example of chronic and/or acute stimulant induced excited delirium. Excited delirium was first described in the medical literature in 1849 and is now well recognized as a condition leading to metabolic acidosis and a major cause of in-custody-death.[27-37] These include:

1. Chronic stimulant abuse as related by his own friends.
2. Hyperthermia as evidenced by his complete disrobing.
3. Bizarre behavior as evidenced by his unusual cell phone chat.
4. Aggressive and threatening behavior as demonstrated by his behavior towards the CPD officers.
5. Paranoia as clearly evidenced in the records.
6. Death in a sudden collapse.
7. Failure of defibrillation shocks.

Independent cardiac electrophysiologists — selected by The DME himself — later concluded (in May 2006) that excited delirium was, in fact, the primary cause of death.

The Actions of The DME

The DME performed the examination on February 11, 2005 beginning at 7h45. Basic toxicology was reported on March 11. Apparently, the DME failed to submit the hair or brain for evaluation for neuropharmacology of chronic stimulant abuse.

On or about February 11, 2005 TASER International, Inc. (TASER) sent a large binder of scientific, medical, and law enforcement studies by express one-day shipping to The DME. On February 25, 2005 Mr. James Ruggieri delivered a short talk on the alleged lethality of TASER ECDs at the American Academy of Forensic Science (AAFS) annual meeting in New Orleans, Louisiana. This presentation received widespread publicity as Mr. Ruggieri claimed that based upon his information ECDs had a 50% fatality rate. The DME contacted Mr. Ruggieri within days and requested a copy of his PowerPoint® slides.[5]

On July 5, 2005, The DME sent a letter to a TASER medical advisor, Robert Stratbucker, MD, Ph.D. In this letter The DME appeared to show genuine concern in seeking answers regarding the effects of prolonged TASER applications and possible effects on respirations. However, The DME made two false statements in his letter.

1. The DME stated that the long TASER application was the final one, which is the opposite of the facts.
2. The DME stated that the critical timing was "paramedics witnessing the TASER ECD event and immediately initiating CPR." This, of course, completely contradicted the police and paramedic records which showed Mr. Hasse to have good vitals — and an 8 minute period — between the two events.

On July, 28, 2005 Dr. Stratbucker sent a 3.5 page letter to The DME answering his (the DME's) questions in detail. Dr. Stratbucker stressed that TASER devices have proved incapable of inducing VF and that the duration of the application was irrelevant. At this time the Hennepin County Medical Center breathing study had yet to be performed but Dr. Stratbucker gave a well-reasoned opinion explaining why the TASER devices would not harm respiration. Finally, Dr. Stratbucker urged The DME to study the paramedic reports, as they would give valuable clues as to the cause of death.

The Electrocution Theory

On July 28, 2005 The DME apparently called report Frank Main, crime reporter for the Chicago Sun Times, and informally released his findings in an interview. In this interview, The DME blamed the TASER ECD as the primary cause of Mr. Hasse's death. The next day The DME signed his

[5] Mr. Ruggieri's full paper was rejected by the AAFS journal. His membership application was also rejected due to his lack of qualifications. Mr. Ruggieri was later exposed as a high school dropout whose formal education was an Internet degree in web-page design.

autopsy.[6] The DME's report did not mention any study of the incident paramedic's records. He merely stated that the cause of death (COD) was, "electrocution due to TASER application. A contributing factor in his death is methamphetamine intoxication." No scientific reference was given to support the speculative synergy between a TASER application and the methamphetamine or even between the drug and any source of electrical current.

Then followed numerous media interviews, as the DME was the first medical examiner in world history to find a TASER ECD as a primary cause of death.

The Frank Main story was published July 29, 2005:

> Hasse received a five-second electrical burst from the TASER, followed by a 57-second charge, according to Dr. Scott Denton, a deputy medical examiner.
>
> "That's extraordinary," Denton said Thursday. "He became unresponsive and died after this."
>
> The primary cause of Hasse's death was electrocution from the use of the TASER, Denton said. A contributing cause was methamphetamine intoxication, he said.
>
> An autopsy found Hasse's system contained .55 micrograms of methamphetamine per milliliter of blood -- .05 micrograms above what is considered a lethal level. But the illegal drug probably would not have killed Hasse without his getting "pushed over the edge" by the TASER's jolts, Denton said.
>
> Hasse's death was ruled a homicide, which the medical examiner's office defines as death at the hands of another person. The term does not imply a criminal act occurred. "This was an inadvertent killing," Denton said.
>
> **'Medical basis' questioned**
>
> Denton said he plans to meet next week with Chicago Police officials and suggest the devices not be used on people who are acting psychotic or appear to be under the influence of drugs. Many of the people who have died after being shocked by TASERs were found to have drugs in their systems, Denton said.
>
> Denton said he reviewed thousands of pages of information provided by the manufacturer of the stun gun, TASER International, which touted the safety of the devices.
>
> But Denton said he was persuaded by the arguments of James Ruggieri, an expert who says the electrical current from a TASER is enough to cause cardiac arrhythmia despite its low energy output. TASER has strongly disputed Ruggieri's findings and qualifications.

This interview credits The DME with two incorrect statements:

1. The DME reversed the sequence of the shocks by putting the longer shock as the final shock.
2. The quote, "He became unresponsive and died after this" clearly misrepresents the facts and contradicts both the paramedic and police records as Mr. Hasse had documented good vitals — and 8 minutes of time — between the two events.

This interview is very revealing as it suggests a lack of logic and scientific foundation. The DME is claiming that the TASER device directly induced a lethal cardiac arrhythmia. (This is what the term "electrocution" means.[7]) The DME said he was "persuaded by the arguments of Mr. Ruggieri, an expert…" Mr. Ruggieri is the high school dropout with no engineering degrees of any sort who briefly achieved media notoriety in 2005 with his 50% fatality rate claim. (Applying that to the over 600,000 known human uses would lead to a death toll on the order of the Union losses in American Civil War.) There is no evidence that Mr. Ruggieri's outrageous claims have been taken seriously by any other physicians.[8] Also, even Mr. Ruggieri recanted the 50% number in an October 18, 2006 declaration.

The DME went on to make the curious claim that the TASER ECD somehow pushed Mr. Hasse "over the edge" with the "edge" presumably being the methamphetamine intoxication. Since "pushing over the edge" is not a recognized medical term, The DME owed the public an explanation of his creative theory of synergy, yet he produced none. He certainly produced no scientific references supporting his speculation of a synergy.

The following was written by Mr. Douglas Maher, reporter for All Headline News and published July, 30, 2005:

> Ronald Hasse was tasered by Chicago Police after Hasse tried to bite an officer who re-

[6] The autopsy signature is dated July 29, 2005 which would also tend to give the impression that the DME had found the time to study Dr. Stratbucker's response.

[7] "The term is occasionally used to refer to an electrically caused death not involving the direct induction of VF. Based on the reliance on the Ruggieri hypothesis, it is clear that the DME was using the term in the conventional sense.

[8] Later in 2005, Mr. Ruggieri suggested that millions of cardiomyopathy patients should not walk across carpeting, comb their hair, or even remove their clothing as the static electrical shock could cause a lethal arrhythmia.

> sponded to the scene of a dispute. He received the electrical shock produced by the taser for 57 seconds, more than 10 times the usual amount.
>
> "That's a long time," Deputy Medical Examiner Scott Denton says. "It's the thing that makes this one different."

The DME then — as now — has consistently failed to give any scientific support for his speculation that a longer ECD application increases the risk of electrocution. As pointed out earlier, this speculation contradicts everything known about electrocution from animal studies to human studies to accepted safety standards.

Comments from a TASER representative about Mr. Ruggieri's lack of qualifications were also published in some articles. It is possible that The DME began having some concerns about his reliance on Mr. Ruggieri as suggested by another story appearing on July 30, 2005. Reporters David Heinzmann and John Chase wrote the following in the Chicago Tribune:

> Hasse had a significant amount of methamphetamine in his bloodstream, which Denton said was a contributing factor to his death. He said he could not conclude whether the 57-second Taser shock alone would have been fatal if Hasse's body had not already been under stress of the drug.
>
> Taser International, maker of the device, has waged a persistent media campaign in recent years--mostly via e-mail--to combat research that has suggested doubts about the company's claim that the device is non-lethal under all circumstances. The Arizona-based company immediately challenged Denton's conclusion.
>
> "We believe that the scientific and medical community will publicly challenge this conclusion based upon the lack of credible evidence. Taser International will seek a judicial review of the report, and the basis for which those statements were made," said the company's spokesman, Steve Tuttle.
>
> "We are concerned, as the citizens of Cook County should be, about the process in which a member of the medical examiner's office can be influenced by the opinions of others with no formal medical or engineering degrees."

The DME now appears to back off from Mr. Ruggieri's 50% lethality claim when he states that, "…he could not conclude whether the 57-second Taser shock alone would have been fatal…" Mr. Ruggieri had stated that the TASER ECDs alone had a 50% fatality rate and thus it would appear that The DME is trying to distance himself from relying on Mr. Ruggieri. Unfortunately, to do this The DME had to go out on other thin ice to further rely on his unsupported theory of synergy between methamphetamine and electrical currents.

The DME Changes his Theory:

A week later, The DME appears to completely abandon the electrocution theory and then advanced a new theory of respiratory arrest. The following was written by Mr. Frank Geary, and published in the Las Vegas Review Journal on August 7, 2005:

> Scott Denton, assistant medical examiner for Cook County, Ill., for nine years and a member of the board of directors of the National Association of Medical Examiners, determined the primary cause in Hasse's death was electrocution from the TASER, with a contributing factor being methamphetamine intoxication.
>
> Denton blamed the electrical charge in Hasse's death, even though he had more than the lethal limit of the drug in his blood.
>
> The electrical shock from the TASER contracts the muscles and, as a result, impairs a person's ability to breathe. With his blood pressure and pulse racing in response to the drugs and the struggle with police, Hasse died because he couldn't breathe during the period of time he was being shocked, Denton said.
>
> Had the TASER not been used for such an extended time, Hasse probably wouldn't have died, Denton said.
>
> An autopsy found Hasse had 0.55 micrograms of methamphetamine per milliliter in his blood -- just above what is considered a lethal level.
>
> "At the end of that 57 seconds, he was on the floor exhausted, and then he became unconscious and was unable to be resuscitated," Denton said. "You're causing muscular paralysis, so the person isn't breathing. So, during that 57 seconds, he wasn't breathing."
>
> Denton said it took him five months to determine the cause of death because he did exhaustive research on TASERs before reaching his conclusion.
>
> Chicago police stopped the distribution of an additional 200 TASERs after Hasse died. But it did not halt the use of the weapons.
>
> Denton said he believes much is still not known about the medical effects of the TASER, but that more information will be coming out because medical examiners, police officials and others are now taking a close look at the devices.
>
> "Who is dying from TASERs? It's people on drugs and people who are getting multiple bursts or a burst for a prolonged period of time," Denton said.

The first two paragraphs of this article merely restate the autopsy. However, we then see a complete change in the alleged causative link of Mr. Hasse's death to the TASER ECD. The DME is no longer relying on Mr. Ruggieri who never opined on breathing effects. The DME then went on to add the false statements that the criminal suspects "dying from TASERs" were people receiving multiple or prolonged bursts. (In fact, the majority of such people received only a single TASER ECD application.)

Another false statement (somewhat modified from earlier interviews) is in the quote, "At the end of that 57 seconds, he was on the floor exhausted, and then he became unconscious and was unable to be resuscitated," when the facts are that Hasse had good vitals after both ECD applications.

On November 10, 2005 Mr. Hasse's family sued TASER through attorney Sam Cappas. On December 28, 2006 the Circuit Court of Cook County granted a summary judgment in favor of TASER and against the Hasse estate after the counsel for the estate, Sam Cappas, could not produce scientific evidence to counter an admission that the TASER ECD played no role in Mr. Hasse's death.

Sometime before December 2005, The DME furnished selected material to the cardiac EP group at the Illinois Masonic Hospital. Based on this material the Illinois Masonic Hospital EP group then submitted an abstract to the Heart Rhythm Society describing the Hasse case as the first confirmed death from a TASER ECD application. On May 4, 2006 TASER medical and scientific advisors, led by Hugh Calkins, MD, head of EP at Johns Hopkins University, wrote a letter to Richard Kehoe, MD who heads the Masonic EP group providing him a copy of the paramedic report.

On May 19, 2006 Dr. Sadhu of Dr. Kehoe's group presented their paper at the Heart Rhythm Society meeting in Boston, Massachusetts. He began the presentation by explaining that they had received new information since they had submitted their abstract in December 2005.

> In light of very recently obtained documents, which were not available to the authors at the time of abstract submission, some of our original hypotheses have been modified on today' presentation.

The presenters went on to conclude that the primary cause of death was excited delirium and not the TASER device:

> Primary cause: VF occurring secondary to the cumulative adverse metabolic and myocardial effects resulting from a state of severe sympathetic stimulation (Excited Delirium)

While adding that the TASER device may have played a "potentiating" role, the presenters repudiated the essential thrust of the DME's conclusions.

The DME has been unwilling or unable to answer any of the numerous scientific objections raised to his highly publicized autopsy report. He continues to refuse to correct it in any manner despite written requests.

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Appendices:

1. TASER ECD download printout
2. Paramedic report
3. Hasse timeline
4. DME dateline

TASER X26 Download:

TASER Informatio		Downloaded By	
Serial #	X00-022238	Name	Robert Quaid
Model #	X26	Dept	Chicago
X26 Software Version	15	Rank	Capt.
Dataport CD Version	15.6	Windows Version	Microsoft® Windows NT(TM) Service Pack 1
Record Date Range	02/10/2005 - 02/10/2005	Report Generated	02/10/05 15:50:31 (local)
Computer Time Zone	Central Standard Time		
Using Daylight Saving Time	No		

Recorded Firing Data

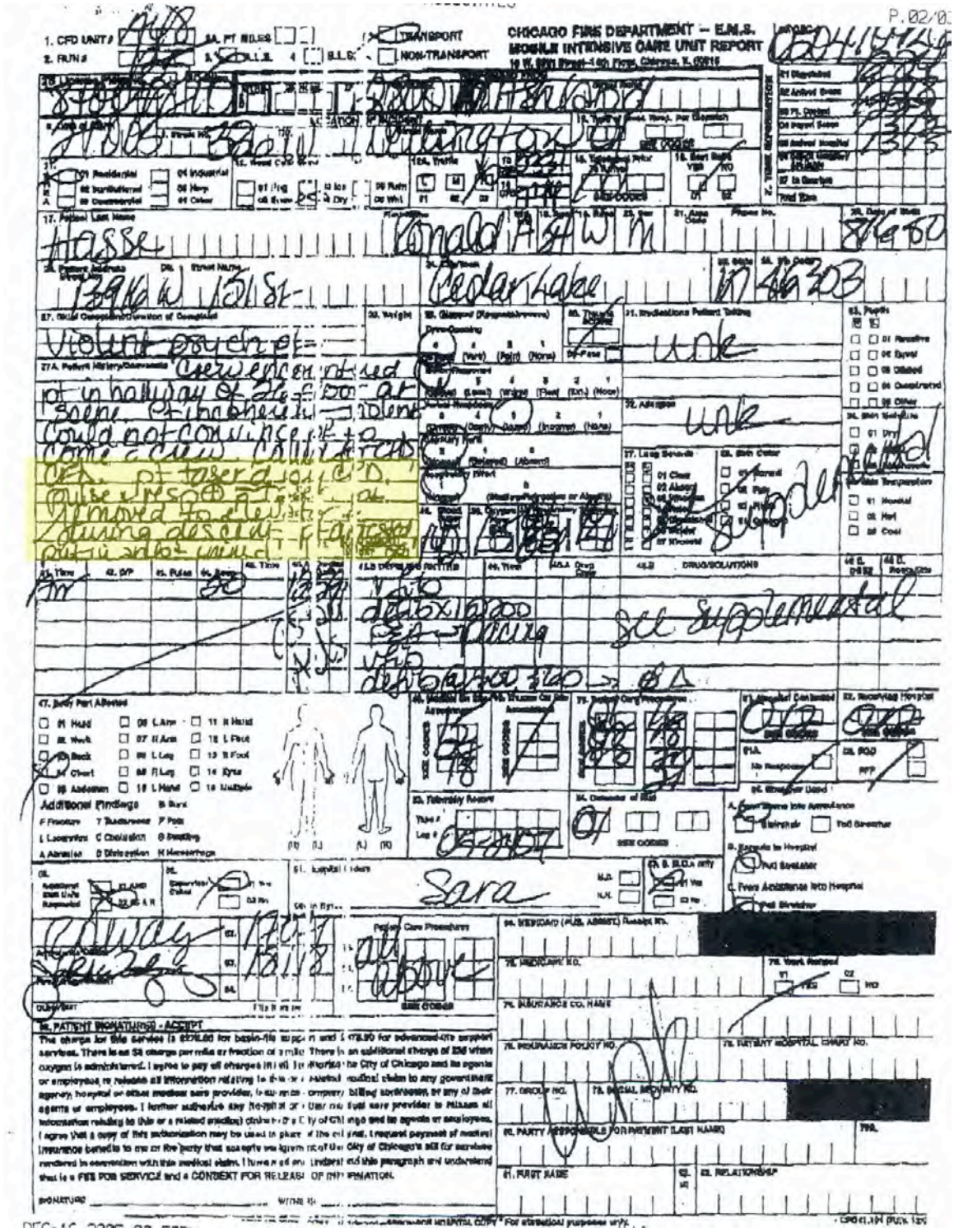
Seq	GMT Time	Local Time	Duration	Temp	Battery
0001	02/10/05 18:50:49	02/10/05 12:50:49	57	30	93
0002	02/10/05 18:50:55	02/10/05 12:50:55	5	30	89

Recorded X26 Time Changes

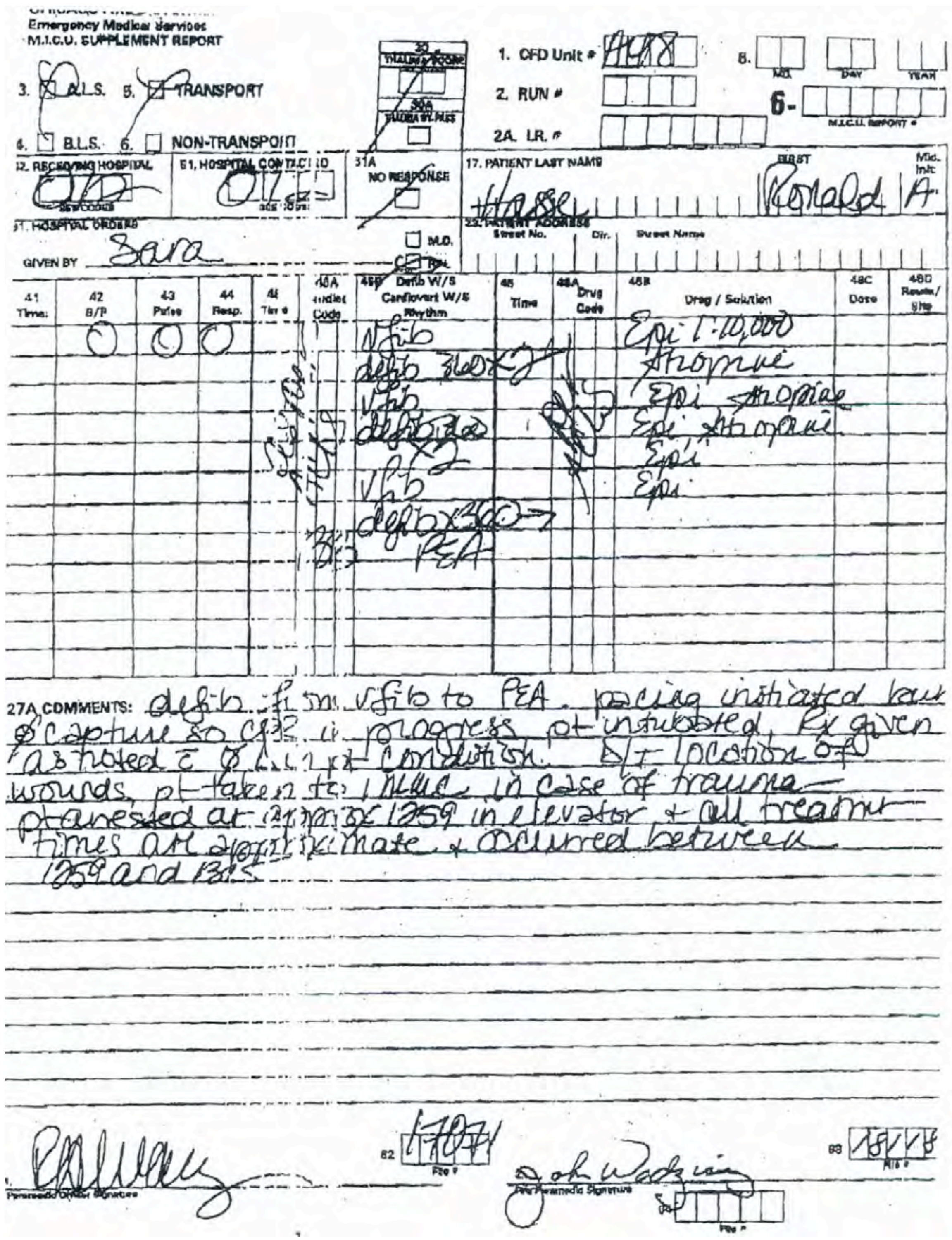
Seq	GMT Time	Local Time	Change Type

End of Report.

Paramedic Report p 1 (highlighting added).



Paramedic Report p 2



Emergency Medical Services
M.I.C.U. SUPPLEMENT REPORT

1. CFD Unit # 4488
2. RUN #
2A. I.R. #
6- M.I.C.U. REPORT #

3. [X] A.L.S. 5. [X] TRANSPORT
4. [ ] B.L.S. 6. [ ] NON-TRANSPORT

12. RECEIVING HOSPITAL: 070
51. HOSPITAL CONTACT ID: 017
31A NO RESPONSE
17. PATIENT LAST NAME: Hasse FIRST: Ronald MID. Init: A
22. PATIENT ADDRESS: Street No. / Dir. / Street Name

51. HOSPITAL ORDERS
GIVEN BY: Sara
[ ] M.D. [X] R.N.

41 Time	42 B/P	43 Pulse	44 Resp.	45 Time	45A Cardiac Code	45B Defib W/S Cardiovert W/S Rhythm	46 Time	46A Drug Code	46B Drug / Solution	46C Dose	46D Route/Site
	0	0	0			Vfib			Epi 1:10,000		
						defib 360 x 3			Atropine		
						Vfib			Epi Atropine		
						defib x 360			Epi Atropine		
						Vfib			Epi		
						defib x 360			Epi		
						PEA					

27A COMMENTS: defib from Vfib to PEA. pacing initiated but Ø capture so CPR in progress pt intubated. Rx given as noted c Ø chg in pt condition. D/T location of wounds, pt taken to [illegible] in case of trauma pt arrested at approx 1259 in elevator + all treatment times are approximate + occurred between 1259 and 1315

Paramedic Officer Signature — 82 Fire # 1707 — Paramedic Signature — 83 Fire # 1511

The Hasse Timeline for 10 Feb. 2005:

~ Noon	Hasse goes to appt. 2610 at 336 W Wellington.
12h24	Residents call 911 reporting a "shortness of breath." Paramedics Alvarez and Wodzisz arrive Paramedics call for CPD backup Officers Eitel and Marshall arrive Officers call for a TASER Sgt. O'Reilly arrives with TASER X26
12h49:46	TASER ECD activated for 57 seconds
12h50:49	Hasse is uncooperative again
12h50:50	TASER ECD activated for 5 seconds Hasse handcuffed and placed in stair chair Respiration and pulse verified Wheeled to elevator Transported down 26 floors
12h59	Hasse arrests and resuscitation attempts begin
13h15	Hasse arrives Masonic hospital
13h58	Pronounced by Dr. Gillepsie.

The DME Dateline for 2005 and 2006:

10 Feb 2005	Hasse dies
11 Feb	DME performs examination
~12 Feb	DME receives binder of ECD safety studies from TASER International
25 Feb	Mr. James Ruggieri gives talk claiming a 50% fatality rate from TASER ECDs
27 or 28 Feb	The DME calls Ruggieri and asks for copy of his slides
11 March	Toxicology reported
March-June	DME performs "exhaustive research" on TASER ECDs
5 July	DME sends letter to Dr. Stratbucker asking for more information
~27 July	Dr. Stratbucker replies
28 July	DME gives interview to Frank Main of the Chicago Sun-Times blaming electrocution by TASER ECD. Main contacts TASER who explains Ruggieri's lack of qualifications
29 July	DME signs autopsy Frank Main story runs DME gives interview with Chicago Tribune partially backing away from relying on Ruggieri
~6 Aug	DME abandons electrocution theory and changes causation theory to respiratory arrest in interview with Las Vegas Sun Times
Fall	DME gives information to Masonic EP group omitting paramedic report. They submit abstract to HRS repeating original DME theory of electrocution.
10 Nov	Attorney Sam Cappas sues TASER International on the basis of DME's finding.
4 May 2006	TASER medical advisors submit paramedic report to Dr. Kehoe, head of Masonic EP group.
19 May	Dr. Sadhu, of the Masonic EP group, gives HRS talk but reverses original abstract thesis to now blame excited delirium
28 Dec	Lawsuit against TASER International dismissed.