

## Vehicular Heat Stroke Fatalities— Tragic Accident or Murder?

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EVERY YEAR AS SUMMER BEGINS to bring images of the beach and cookouts, the weathermen sound the warnings—the weather will be too hot for children, elderly, and pets. The media always reminds the public “not to leave your children or pets in your car.” Despite countless heat warnings issued, these deaths still happen each summer. The average age of the victim of fatal vehicular heat stroke is under three years of age.<sup>1</sup> Every year, prosecutors struggle with the decision to charge a parent in the face of media blitzes that call such incidents “tragic accidents.” The year 2010 saw a record 49 deaths, and 2011, as of November 8, witnessed 31 children die from vehicular heat stroke.<sup>2</sup> Prior to 2010, the average number of cases of hyperthermia or vehicular heat stroke was 38.<sup>3</sup>

Heat-related illnesses begin as a continuum divided into three phases. The mildest form, heat stress, manifests itself in the physical discomfort commonly experienced with activity on a hot day. The symptoms of the second phase, heat

exhaustion, include intense thirst, weakness, discomfort, anxiety, dizziness, fainting, and headache. The final phase is heat stroke, which has a mortality rate of 80 percent for children.<sup>4</sup>

Cellular damage begins to occur once the body’s core temperature reaches 104 degrees Fahrenheit (40 degrees Celsius), which leads to organ failure and death.<sup>5</sup> A child left in a hot car long enough will progress through the three phases and experience central nervous system dysfunction, which results in delirium, seizures, coma and death.<sup>6</sup> A 50 percent child mortality rate is associated with sustained exposure to heat.<sup>7</sup> A body temperature of 106.9–107.6 degrees Fahrenheit is lethal within 45 minutes to a maximum of eight hours.<sup>8</sup>

Because of their immature respiratory and circulatory systems, children do not manage heat as effectively as adults and are more susceptible to heat induced illnesses. As soon

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as the body temperature raises more than one degree Fahrenheit above baseline (99 degrees Fahrenheit), heat defense mechanisms come into action: there is increased blood flow to the skin, allowing the body to radiate heat, and increased sweating, allowing cooling by evaporation. Hyperthermia occurs once those regulatory mechanisms are overloaded. Once sweating stops, the body temperature rises rapidly. Children have a greater surface area to body mass ratio, a lower rate of sweating, a slower rate of acclimatization, and their body temperature can increase three to five times faster than an adult.<sup>9</sup> A child's core body temperature can quickly reach up to 108 degrees. How rapidly this occurs, depends on the child's baseline temperature, hydration status, and amount of clothing, and also on the degree of environmental temperature. Again, from the above mentioned study, a minimum of one to two hours seems necessary.<sup>10</sup> Once the child is dead the body may continue to heat from external sources even more rapidly because the body's cooling mechanisms (increased blood flow to the skin and sweating) are abolished.

Given the unique physiology of children and the high temperatures experienced in the interior, a vehicle can quickly become a death chamber. Most car windows are transparent to solar radiation but opaque to long wave radiation. This characteristic prevents heat from exiting and creates a greenhouse gas effect that rapidly heats the vehicle.<sup>11</sup> On days when the ambient temperature is 86 degrees Fahrenheit or higher, the temperature inside a vehicle can reach 134 degrees to 154 degrees.<sup>12</sup>

The temperature inside a vehicle can rise more than 40 degrees in less than an hour with more than 80 percent of that increase occurring in the first 30 minutes.<sup>13</sup> Children can die of hyperthermia even when the temperature outside is not especially hot. Experiments done on sunny days with milder ambient temperatures produced significant temperature increases.<sup>14</sup>

### **ACCIDENT, NEGLIGENCE OR MURDER?**

When evaluating the circumstances of a case where a child has died from vehicular heat stroke, the prosecutor will be faced with public scrutiny and media bias. There often exists a community perspective that an overzealous prosecutor is seeking unnecessary retribution or that the tragedy of the accident should be considered punishment enough. A prosecutor will have to first decide if the caretaker committed a crime. Due to the serious nature of any potential

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### **WIDE DISPARITY OF SENTENCES**

An Associated Press analysis of more than 310 unattended child fatal incidents in the past ten years found that prosecutions and penalties vary widely. Criminal charges are filed in half of all cases even when a child was left unintentionally. Whether a charge occurs and the duration of the sentence often depends on where the death occurred and the caregiver involved. This study showed that while mothers and fathers are charged and convicted at about the same rates, mothers are 26 percent more likely to do time.<sup>15</sup> In addition to being more likely to serve time, the median sentence of mothers is two years longer than that of fathers. Day care workers and other paid baby sitters are more likely than parents to be charged and convicted, but they are jailed less frequently than parents and for less than half the time.<sup>16</sup>

### **LEGAL COMPARISONS**

The wide range of statutes on state books can partially explain this disparity. Charges vary state by state and can range from manslaughter to felony child abuse and neglect to felony murder.<sup>17</sup> Nineteen states currently have laws that prohibit leaving children unattended in automobiles.<sup>18</sup> The penalties range from noncriminal traffic violations to second-degree manslaughter if a child dies as a result of being unattended. In Kentucky, Bryan's Law makes it illegal to cause the death of a child in a vehicle from leaving the child unattended.<sup>19</sup> The offender in Kentucky may be charged with manslaughter in the second degree. In Michigan if a violation results in the death of a child, the person respon-

sible for the care of the child can be imprisoned for no more than 15 years or a fine not to exceed \$10,000, or both.<sup>20</sup> In Texas, a child under the age of seven may not be left unattended in a motor vehicle, and all offenses are punishable by a fine not to exceed \$500.<sup>21</sup>

The statutes vary greatly in detail and many do not provide for circumstances that result in the death of a child left unattended in a motor vehicle. However, even if a state does not have a specific law addressing unattended children, prosecutors have the discretion to file charges under other existing child endangerment laws. State legislatures need to fully consider the options available when adopting an unattended child law. Because of the wide range of charges available to a prosecutor and the disparity of outcomes found in such cases, the legislature may desire some form of consistency. However, considering the nature of the circumstances involving the death of a child, it is important not to tie the hands of the prosecutor. Ideally, the prosecutor understands the facts and the investigation best and should exercise discretion in deciding what degree to pursue criminal charges.

## CASE ANALYSIS

Cases involving vehicular heat stroke are difficult where there is no prior history of neglect or where the court limits evidence of neglect. Kevin Christopher Kelly was charged with involuntary manslaughter and reckless endangerment of a minor child when his 21-month-old daughter Frances was left in the family car for over seven hours in May 2002. Although there were over 41 instances of neglect documented by prosecutors involving all 13 of the Kelly children, the court limited evidence to three prior instances where children were left in vehicles unattended.<sup>22</sup> The jury convicted Kelly of both felonies and recommended a nine-month sentence on the manslaughter charge and three months on the reckless endangerment charge. Interviews with jurors revealed that they felt that the mother could not safely raise the remaining 12 children alone.<sup>23</sup>

In December 2008, Miles Harrison was charged and acquitted of involuntary manslaughter for the tragic death of his adopted 21-month-old son named Chase. The defendant left the child in his vehicle for over nine hours while he worked. The trial judge determined that the evidence did not support a finding that the negligence was “so gross, wanton or culpable as to show a callous disregard for a

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human life.”<sup>24</sup>

In Portsmouth, Virginia, two-year-old Andrew Culpepper was found dead in his family’s vehicle after his father picked him up from his grandparents. The father had worked a long shift at his job and after picking up the child, went inside the house and fell asleep.<sup>25</sup> The commonwealth’s attorney made the decision to not charge Culpepper with any crime.

Tara Maynor, however, received 12 ½ to 60 years for the second-degree murder of her two sons after she left them in a hot car while she had her hair done and received a massage in 2004 in Detroit, Michigan. She told police she was “too stupid to know they would die.”<sup>26</sup>

## COMMON DEFENSES

In many of these cases, anecdotally speaking, the perpetrators are white, upper middle class and have no criminal record.<sup>27</sup> That a tragic accident occurred remains the most common defense of the caregiver in unattended child deaths. In a recent study, the researchers examined the circumstances that led to child hyperthermia fatalities. Researchers found: 39%: child “forgotten” by caregiver; 27%: child playing in unattended vehicle; 20%: child intentionally left in vehicle by adult; 14%: circumstances unclear.<sup>28</sup>

Prosecutors should also be aware of medical defenses. The defense may try to claim this child suffered from a mutation that made him/her susceptible to receptor type one gene mutation (RYR1) causing malignant hyperthermia.<sup>29</sup> This defense can be easily defeated based upon the fact every child left in a vehicle in high temperatures for an extended period of time will die.

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In cases involving hyperthermia that occur in locations other than in a vehicle, the history provided by the caretaker should be critically assessed. The caretakers may insist that they frequently checked on the children. However, this manner of death is a slow process and caretakers would have noted the heat was excessive inside the residence if they in fact were checking on the child as is often claimed.<sup>30</sup> In addition, caretakers who actually check on a child exposed to high temperatures would notice as the child becomes hot to the touch, uncomfortable, and/or drenched in sweat. Children with severe heat illness do not breathe quietly but go through a phase of rapid deep respirations followed by gasping.<sup>31</sup> This type of hyperventilation occurs in all patients with hyperthermia.<sup>32</sup>

## THE INVESTIGATION

The disparate sentences, the public reaction, and the media frenzy that erupts when a child is left to die in a hot car illustrate the need for prosecutors to prepare for these cases long before such a tragedy occurs. The circumstances surrounding a death due to hyperthermia must be thoroughly analyzed to determine the degree of culpability of the caregivers and whether or not the death was an accident or homicide.

While one will assume the initial crime scene will be the vehicle, the child's body holds a great deal of investigative clues. The child's body temperature should be recorded as soon as practicable. A rectal temperature is the most reliable and accurate measurement for obtaining the core temperature of the child. In one case, even after being in air-conditioning for over two hours, the child's body temperature was 105.9 degrees F.<sup>33</sup> If possible, the prosecutor should reach out to emergency services, police, and emergency physicians, and establish a protocol which encourages documenting the body temperature in a timely fashion.

In addition to an increased core temperature, the child's body will also show indicia of vomiting, skin slippage, and decomposition. A child subjected to high temperatures may rip out clumps of hair, scratch, and claw at the car seat or at themselves in an effort to reduce their temperature. The investigator should be trained to look for evidence of hair and skin in the child's fingers or bald spots on the scalp.

Parents and caregivers need to be questioned to determine the last time the child was fed and what items were consumed. This becomes an important issue if parents pack a lunch everyday but failed to do so on this day. At autop-

sy, address the stomach contents. Do the contents of the stomach match the description of the food intake and timeline given by the parents. There have been cases where parent/caregivers have planned the death of the child and have made an effort to cook the child's favorite food and dressed

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the child in a "special" outfit.

The prosecutor will want to preserve the clothes the child was found wearing as they indicate the relative size and vulnerability of the child. Prosecutors should be mindful that not every juror will know how vulnerable or small a one-year-old child is and the clothing can act as a powerful reminder.

When focusing on the victim, the prosecutor will want to know the child's medical history. The medical history should include any and all prenatal records, including prenatal parenting classes (these classes often have sections on car safety etc.). Investigators will need to identify factors that might have made the children a target of the caregiver. "Did the child have cognitive or physical disabilities that would perhaps make them a target?" Recent cases have involved children with reactive attachment disorder, developmental delays and autism. Investigators and prosecutors will need to consider the extent to which the child's existence in the families represented a stressor relieved by the child's death and whether caregivers acted as a result. Examination into life insurance, domestic upheaval surrounding the child's existence, paternity, litigation between separated or divorced parents over custody/child support, disparate treatment of this child in comparison to siblings, etc. may allow the prosecutor to establish motive.

The classic case of hyperthermia will include some

change in schedule or an additional stressor causing a parent to forget about the child in the car. The “I forgot” defense is very typical in these cases. It is critical that police get the parent to detail their daily schedule. “Who takes the child on a daily basis to their day care? Does anyone call the day care to check on the child during the day? Details should include how often the perpetrator goes to their car on a daily basis. Do they go out to lunch, the gym, meetings, etc. on a daily basis? Do they travel the same route everyday? Do they make stops before going to work? Do they use their cell phone on their way to work? Who picks up the child? Who calls if the child is not in day care? Does day care call if the child does not arrive?” Even details such as where mom places her purse in the car or where dad puts his gym bag can be critical to establishing evidence of the crime. “Are these items always placed in the back seat along with the child?” Police should attempt to get a video-taped recreation showing the events of the day without alerting the perpetrator that everything they do may have bearing on the case. Establish a standard routine and then ascertain why, if any, there were changes in the routine.

## THE VEHICLE

Immediately upon arriving on the scene, police should perform a measurement of ambient temperatures. The make and model, color, and position of the vehicle in the sunlight all play a significant factor in the rate of temperature

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will demonstrate how quickly the temperature rose in the interior of the vehicle and the conditions experienced by the child in his or her last hours. This information provides powerful evidence to show a jury if charges are pursued. Other important evidence that may be found within the vehicle includes the child’s bodily fluids, hair remnants, scratch or claw marks from the child’s attempt to escape, the temperature setting of the vehicle before it was parked and even the odor of death.

In the Casey Anthony trial, the prosecution called Dr. Arpad Vass to testify regarding the scent of death in Casey Anthony’s trunk. It was the first time that the smell of a human body had ever been presented as evidence in court. Dr. Arpad Vass has researched and documented decomposing bodies for years. He testified that a decomposing human body releases specific identifiable chemicals, and that there was an “extremely overwhelming” odor when he opened a sealed evidence can containing a carpet sample from the trunk of Anthony’s car. He stated that he recognized the odor as the distinct smell of human decomposition. Because this was the first instance of the “odor of death” being used as evidence in court it had to pass the *Frye*<sup>34</sup> standard, a test to check that new scientific evidence stands up to scrutiny. The *Frye* test states that scientific evidence is admissible if the relevant scientific community generally accepts it. In the Anthony trial, prosecution was able to satisfy the *Frye* standard and the evidence of death odor was admitted.

Testimony regarding the odor of the vehicle can provide strong evidence in the courtroom. Warmer temperatures increase the rate of decomposition, which are responsible for the identifiable odor. If a child has died due to hyperthermia from being left unattended in a vehicle, the vehicle should be sealed properly to preserve the odor of death. Preserving this odor will be important evidence for instances where a caregiver claims to have continued driving with the deceased child in the car.

## OTHER ASPECTS OF THE INVESTIGATION

The investigation will also include all the standard protocols for a child abuse investigation. This should include a thorough neighborhood canvas to determine if there is a history of neglect, along with Social Services complaints, call for service, domestic violence allegations, interviews with day care or school personnel, etc. Accurint or Lexis Nexis police investigative computer checks will reveal where the family has lived and each location should be investigated in

the same manner. In a family where there is abuse, frequent changes in domicile and residence are not uncommon. A search warrant should include a list of all diaries, calendars, residential documents, family photographs, birth certificates, etc. Paternity, litigation over custody/child support or issues involving the same may be a motive to want the child dead. Interviews with EMS and any documentation by first responders of the history initially given by caregivers, along with 911 calls involving the event, may allow prosecutors to question the timeline.

## PREVENTION

Vehicular stroke deaths remain tragic because they are so easily preventable. Prosecutors and police should consider uniting with Safe Kids Coalition and Kids and Cars to educate and remind parents and caregivers of the need to never forget a helpless child again. Simple steps such as placing a wallet or phone in the backseat with the child or making arrangements with a daycare provider to be notified if a child does not show, are simple solutions that can go a long way to ensure a child never dies from being left in a car again. Until that day comes, prosecutors need to establish a protocol to thoroughly investigate these cases. In doing so, the prosecutor can be confident in any charging analysis that they have the evidence and information needed to make the right decision.

- 1 Child Vehicular Heat Stroke Summary, Kids and Cars, Nov. 8, 2011, <http://www.kidsandcars.org/userfiles/dangers/heat-stroke/heat-stroke-fact-sheet.pdf>.
- 2 *Id.*
- 3 *Id.*
- 4 J. Lin, R. Losey & H. Prendergast, *An Evidence-Based Approach to Hyperthermia and Other Heat-Related Emergencies*, 6(4) Pediatric Emergency Med. Prac. (2009).
- 5 J.A. Becker & L.K. Stewart, *Heat Related Illness*, 83(11) Am. Fam. Physician 1325 (2011).
- 6 L.R. Leon & B.G. Helwig, *Heat Stroke- Role of Systemic Inflammatory Response*, 109(6) J. App. Physiol. 1980 (2010). While this article focuses on the child victim, some of these same principles may apply to the elderly victim and fatal animal cruelty cases. Y. Bruchim, E. Loeb, J. Saragusty & I. Aroch, *Pathological Findings in Dogs with Fatal Heat Stroke*, 140(2-3) J. Comp. Pathology 97 (2009).
- 7 RE Behrman, R.M Kliegman & HB Jenson, eds. *Nelson Text-book of Pediatrics*, 16th ed. Philadelphia: WB Saunders (2000).
- 8 A. Bouchama & J. Knochel, *Heat Stroke*, 346 New Eng. J. Med. 1978 (2002).
- 9 J.R. Bytomski & D.L. Squire, *Heat Illness in Children*, 2(6) Curr Sports Med Rep 320 (2003); Kazuyo Tsuzuki-Hayakawa, Yutaka Tochihiro & Tadakatsu Ohnaka, *Thermoregulation during heat exposure of young children compared to their mothers*, 72 Eur. J. Applied Physiology and Occupational Physiology 12 (1995).
- 10 H.F. Krous, J.M. Nadeau, R.I. Fukumoto, B.D. Blackburne & R.W. Byard, *Environmental Hyperthermic Infant and Early Childhood Death: Circumstances, Pathologic Changes, and Manner of Death*, 22 Am. J. of Forensic Med. and Pathology 374 (Dec. 2001).

- 11 A. Grundstein, J. Dowd & V. Meentemeyer, *Quantifying the Heat-Related Hazard for Children in Motor Vehicles*, 91(9) Am. Meteorological Soc'y 1183 (2010).
- 12 C. McLaren, J. Null & J. Quinn, *Heat Stress from Enclosed Vehicles Moderate Ambient Temperatures Cause Significant Temperature Rise in Enclosed Vehicles*, 116(1) Peds 109 (2005).
- 13 *Id.*
- 14 *Id.* at 110. Of significant note was the fact that opening the windows 1.5 inches had minimal effect on the temperature rise or maximum temperature obtained. This study also provides an excellent bibliographical source for the prosecutor and includes the study of perspiration rates of children.
- 15 Allen Breed, *Wide Disparity Exists in Sentences for Leaving Kids to Die in Hot Cars*, USA Today, July 29, 2007.
- 16 *Id.*
- 17 In Virginia, prosecutors could consider an involuntary manslaughter charge in violation of VA Code 18.2-36; reckless endangerment of a minor child in violation of 18.2-371.1(B); felony child abuse in violation of 18.2-371.1(A); felony murder in violation of 18.2-33 or murder in violation of 18.2-32. In cases where a child has not sustained serious injury, prosecutors may consider charging contributing to the delinquency of a minor in violation of VA Code 18.2-371, which is a misdemeanor. Virginia has not specifically outlawed leaving a child in a car and efforts to criminalize such behavior have failed since 2002. Virginia prosecutors may also want to consider cruelty to children in violation of 40.1-103 of the Code of Virginia.
- 18 These states are: California, Connecticut, Florida, Hawaii, Illinois, Kentucky, Louisiana, Maryland, Michigan, Missouri, Nebraska, Nevada, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, and Washington.
- 19 *Summary of Unattended Kids in Cars Laws*, Safe kids USA Feb., 2011, <http://nlyca.safekidsweb.org/resources/documents/Public%20Policy/NLYCA%20-%20Law%20Summaries%20-%2014-11%20-Final.pdf>.
- 20 *Id.*
- 21 *Id.*
- 22 *Kelly v. Commonwealth*, 42 Va. App. 347, 592 S.E. 2d 353 (2004).
- 23 *Id.* The judge cut the jury verdict to one day in jail for seven years, yearly blood drives, and prison ministry. The judge felt the family suffered enough.
- 24 Scott McCabe, *Father Acquitted of Manslaughter in the Death of Adopted Son*, The Washington Examiner, Dec. 17, 2008. This decision, along with a number of other abuse cases involving adopted Russian children in the United States, created a moratorium on Russian to American adoptions.
- 25 Gene Weingarten, *Forgetting a Child in the Back Seat of a Hot, Parked Car is a Horrifying, Inexcusable Mistake. But is it a Crime?* Washington Post, March 8, 2009.
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- 27 While there are no formal statistics of this nature, in Virginia, a number of the defendants were white professionals with no contact with the criminal justice system.
- 28 A. Guard & S. S. Gallagher, *Heat-related deaths to young children in parked cars: an analysis of 171 fatalities—U.S., 1995-2002*, 11 Inj. Prevention 33 (2005).
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- 30 Among 29 children who died of hyperthermia/heat stroke the shortest interval between the time of heat exposure and the time of death was 1 hour (Range from 1-10 hours). H.F Krous, J.M. Nadeau, R.I. Fukumoto, B.D. Blackburne & R.W. Byard, *Environmental Hyperthermic Infant and Early Childhood Death: Circumstances, Pathologic Changes, and Manner of Death*, 22 Am. J. of Forensic Med. and Pathology 374 (Dec. 2001).
- 31 D.M. Danks, D.W. Webb & J. Allen, *Heat illness in infants and young children*, 2 Brit. Med. J. 287 (1962).
- 32 A. Bouchama & J. Knochel, *Heat Stroke*, 346 New Eng. J. Med. 1978 (2002).
- 33 *Kelly v. Commonwealth*, 42 Va. App. 347, 592 S.E. 2d 353 (2004).
- 34 *Frye v. United States*, 293 F.1013 (D.C. Cir. 1923).