November 28, 2006

John Burton
414 South Marengo Avenue
Pasadena, CA 91101

Re:  *Heston v City of Salinas*
     N.D. Cal. Case No. C 05-03658 JW

Dear Mr. Burton,

At your request I have reviewed the facts pertinent to the demise of Robert Clark Heston and have now reached a medical opinion on the cause of death and contributory factors. In addition to drawing on my medical training and experience as a board certified cardiologist and cardiac electrophysiologist, I have reviewed the documents listed at the end of this report in the course of arriving at a final determination of the cause of death.

The circumstances of Mr. Heston’s demise are well documented in several of the documents on my review list (1-4, 9, 10) and need not be restated here. Relevant issues will be discussed below.

**Cause of Death:**

Due to:  
Multiple System Organ Failure
Cardiopulmonary Arrest
Applications of TASER®

**Contributory causes:**
Agitated state associated with methamphetamine intoxication
Cardiac dilatation and hypertrophy
Rhabdomyolysis

**Case Discussion:**

The likely mechanism of cardiac arrest due to TASER® applications is its documented ability to cause respiratory arrest and severe metabolic (lactic) acidosis. In the setting of methamphetamine intoxication and an abnormal heart, susceptibility to a malignant ventricular rhythm (ventricular tachycardia / ventricular fibrillation) which would degenerate to asystole would be high. Alternatively, the metabolic derangements may have led more directly to a brady-arrhythmia and asystole.

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Ventricular arrhythmia in this setting need not have been due to direct electrical stimulation of the heart by the TASER®, but rather to the ventricular irritability that is seen in this abnormal metabolic milieu. However, I cannot exclude the possibility of direct stimulation of the heart as a mechanism of arrhythmia induction. As many as five TASER® devices were applied for as long as 74 seconds continuous duration. No human or animal studies address the response of the heart to such a stress, but the swine study of comparable body mass to humans by Jauchem and colleagues¹⁶ does document respiratory arrest with single 5 second applications and severe academia with less aggressive application than was rendered to Mr. Heston. Conduction of the electrical impulses to the heart may have also been facilitated by the first and second degree burns that were evident on the right anterior chest wall and the multiple, simultaneous vectors of stimulation.

The TASER® M26 device used by the Salinas Police Department has an electrical output of 50,000 volts, 11 msec pulse width, half sine wave pulses, average current of 3.6ma and 1.76 Joules of energy per pulse. In cardiac electrophysiology studies to test implantable pacer defibrillator systems, a shock of 1 Joule during the “vulnerable period” of the T wave (cardiac electrical cycle) reliably provokes ventricular fibrillation. The imbalances described above widen the “window of vulnerability” of induction of malignant arrhythmia.

In support of TASER® induced respiratory arrest was the observation by multiple officers that “within seconds of the final TASER deployment, Mr. Heston stopped resisting and became cyanotic.”¹¹ Officers initiated CPR which was continued by Paramedics, including in-field intubation. Paramedics reported initial rhythm as asystole. Epinephrine, atropine and narcan were administered and a rhythm was restored. Paramedics estimated decedent’s “down time” at 10 minutes. At Natividad Medical Center the admitting arterial blood gas showed severe metabolic acidosis: pH 6.83 (normal 7.35-7.45), pCO2 42, pO2 313, HCO3 7. The admitting ECG showed no evidence of acute coronary syndrome (myocardial infarction). “If blood pH drops too low then death, attributed to cardiac arrest, is a certainty…”¹⁸

The evidence does not appear to support a “diagnosis” of “excited delirium”:

- Hyperthermia was not present in the current case. No peer reviewed studies or societal statements have been made to remove hyperthermia as a diagnostic criterion.
- Forced restraint was not applied in the current case prior to the time of collapse. In a study by Stratton and colleagues (2001, cited in reference 18), 18 deaths resulting from 216 arrests made of subjects requiring restraint for excited delirium were reported. 198 excited delirium subjects who were physically arrested and hobbled did not die. The 18 deaths were associated with a struggle by the victim which resulted in forced restraint.

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• Common to the Stratton cases and others is a description of unanticipated and short period of calm (estimates 5 min or less) before suffering cardiopulmonary arrest. Not seen in this case.

Mr. Heston was found to have a mildly enlarged and hypertrophic heart. Although this does enhance his susceptibility to malignant ventricular arrhythmia, it is unlikely to have been a primary cause of death. There is no evidence that his functional status (New York Heart Association Functional Class) was diminished, and therefore the likelihood of his heart abnormality being a primary determinant of his collapse is very low.

The unique circumstances and sequence of events of this case have led to my conclusion that the particular applications of TASER® led to cardiopulmonary arrest and the secondary multi-system organ failure which resulted in Mr. Heston’s demise.

Sincerely,

Mark R. Myers, MD, FACC

Appended: List of Materials Reviewed
Curriculum vitae
Re:  *Heston v City of Salinas*
N.D. Cal. Case No. C 05-03658 JW

Materials Reviewed:

1. Autopsy report of Terri L. Haddix, MD
2. Case Review and Opinion of John R. Hain, MD
3. Case Review and Opinion of Steven B. Karch, MD
4. Monterey County Sheriff-Coroner Case Summary by Detective J D Davidson, 8/12/05
5. Central Valley Toxicology Report (CVT-05-2739)
6. Stanford Pathology Consultants heart post mortem & brain autopsy
7. University of Miami School of Medicine Neurochemical Pathology Exam
8. Robert Heston Taser Dataport Readings (Ruiz, Livingston & Goodwin)
9. Paramedic Run Sheet
10. Natividad Hospital medical records, 2/19-20/2005
11. Deposition of Terri L. Haddix, MD
12. Deposition of John R. Hain, MD
13. Deposition of Steven B. Karch, MD
18. Laur, D: Excited Delirium and its correlation to sudden and unexpected death proximal to restraint; a review of the current and relevant medical literature. Victoria Police Department; November 2004
20. Domill Statement on the comparative medical implications of the use of the X26 and the M26 Advanced Taser
21. Webster, J.G.: Electromuscular Incapacitating Devices

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CURRICULUM VITAE

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Partner

Tax I.D. Number: 95-4557282
Date of Birth: October 3, 1955
Staff Privileges: Huntington Memorial Hospital
Active, 1988-Present
Methodist Hospital of Southern California, Arcadia, CA
Active, 1992-Present

EDUCATION:

High School: Lynbrook High School
San Jose, California
1969-1973

University: University of Southern California
Los Angeles, California
1973-1977; BS, Biology
USC Medical Center
Los Angeles, California
1976-1978; Research

Medical School: University of Southern California, School of Medicine
Los Angeles, California
1978-1982; M.D.
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EDUCATION (continued):

Internship: Los Angeles County
USC Medical Center
Los Angeles, California
1982-1983

Residency: Los Angeles County
USC Medical Center
Los Angeles, California
1983-1985; Internal Medicine

Fellowship: Cardiology
Cedars-Sinai Medical Center
Los Angeles, California
1985-1988

NASPE Pacemaker Fellow
Newark Beth-Israel Medical Center
Newark, New Jersey
July 1987 – December 1987

Certification:
Diplomate, American Board of Internal Medicine
September 11, 1985
Certificate #104351

Diplomate, ABIM Cardiovascular Disease
November 10, 1987
Certificate #104351

ABIM, Diplomate in Clinical Cardiac Electrophysiology
November 4, 1992 and December 31, 2002
Candidate #104351

Testamur/NASPEXAM
October 31, 1988
Certificate #229

Licensure: California, 1983-Present
G050231
Mark R. Myers, M.D., F.A.C.C., F.A.C.P.

FOUNDER & MEDICAL DIRECTOR:

Pacemaker Center and Cardiac Electrophysiology Program
Huntington Hospital, Pasadena, California
August 1988 to December 2000

HONORS AND AWARDS:

AMA – ERF / Western Student Medical Research Forum Awards for presentation of meritorious research, February 1979 and February 1980 (Abstracts listed with publications).

Traveling Fellow, North American Society of Pacing and Electrophysiology.
Pacemaker Fellow under Victor Parsonnet, M.D. at the Pacemaker Center, Newark Beth-Isreal Medical Center, Newark, New Jersey. June 1987 through July 1987.

Named as one of LA’s Best Doctors. The November 1996 issue of "Los Angeles Magazine" published, "The Essential Guide to LA’s Best Doctors" naming Dr Myers as among best Cardiologists as voted by peers.

SOCIETY MEMBERSHIP:

American Heart Association; Chairman, Pasadena Branch / Founder, 1993-1994
American Medical Association
American Federation for Clinical Research
American College of Physicians
American College of Cardiology
North American Society of Pacing and Electrophysiology
  Member, Advisory Council, 1990-1994
  Member, Continuing Medical Education Committee, 1994-1998
  Member, Computer Communications Technology Committee, 1995-1996
  Chair, CME-Education for Primary Care Physicians, 1995-1996
  Member, Web Site Tech Advisory Committee, 1996-1998
  Chair, Primary Care Subcommittee, 1997-1998
  Member, Primary Care Subcommittee, 1998-2000
  Member, Web Site Committee, 2000-2002
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RESEARCH ACTIVITIES:

Bibliography: Appended

Major Areas of Research Interest (Past & Present):
- Hypertension
- Relationship of the Renin-Angiotensin and Sympathetic Cardiac Nervous Systems and Hypertension
- Cardiac Electrophysiology and Arrhythmias
- Surgical Therapy for Arrhythmias
- Implantation Anti-tachycardia and Defibrillator Device Therapy for Arrhythmias
- Pacemaker Therapy

Medical Advisory Panel: Siemens Pacesetter Systems, Inc.
Jan 1993 – Dec 1998

PUBLICATIONS: BOOKS AND BOOK CHAPTERS


Mark R. Myers, M.D., F.A.C.C., F.A.C.P.


PUBLICATIONS: Peer Review Articles


Mark R. Myers, M.D., F.A.C.C., F.A.C.P.

PUBLICATIONS: Peer Review Articles (continued):


PUBLICATIONS: ABSTRACTS


Mark R. Myers, M.D., F.A.C.C., F.A.C.P.

PUBLICATIONS: Abstracts (continued)


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SCIENTIFIC PRESENTATIONS:
