Plaintiff's Exhibit 24

to

Complaint for Declaratory Judgment and Injunctive Relief

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Second Dose Needed To Kill Inmate

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Second dose needed to kill inmate

CHRIS TISCH and CURTIS KRUEGER
Published December 14, 2006

STARKE - A death row inmate who argued that Florida's execution procedures were cruel punishment needed 34 minutes and two drug doses to die by lethal injection Wednesday evening.

The scene of a grimacing Angel Diaz once again called into question the way the state kills condemned prisoners. Diaz winced, his body shuddered and he remained alive nearly three times as long as the state's two most recent executions.

Department of Corrections officials said they had to take the rare step of giving Diaz a second dose of drugs to kill him. A second dose is part of their protocol and was anticipated because Diaz had liver disease, which they said can slow the time it takes the drugs to metabolize.

But defense lawyers said Diaz's execution was so unusual it could once again disrupt executions in Florida.

"Obviously there was something very wrong here," said Neal Dupree, supervisor of the Capital Collateral Regional Counsel office for South Florida, which represented Diaz in his appeals.

Dupree, who sat in the front row while Diaz was executed, said the procedure appeared botched, particularly when Diaz squinted his eyes and tightened his jaw as if in pain. Twenty-six minutes into the procedure, Diaz's body suddenly jolted.

"It looked like Mr. Diaz was in a lot of pain," Dupree said. "He was gasping for air for 11 minutes. This is a big deal. This is a problem."

Corrections officials acknowledged that 34 minutes was an unusually long time but said no records are kept that would tell if it's the longest in state history. They said they were not sure how many times a second dose has been needed.

Gretl Plessinger, a Department of Corrections spokeswoman, said it's unknown at what times the first and second doses were given because those records are not kept.

The execution team called for the second dose after noticing on heart monitors that Diaz was not dying, she said.

Diaz's cousin Maria Otero said the family had no knowledge of any liver disease.

"Who came down to Earth and gave you the right to kill somebody?" Otero said, referring to Gov. Jeb Bush. "Why a stupid second dose?"

Bush said in a written statement that the Department of Corrections followed all protocols.

"As announced earlier this evening by the department, a preexisting medical condition of the inmate was the reason tonight's procedure took longer than recent procedures carried out this year," the statement said.

Florida voluntarily began using lethal injection in 2000 after a number of gruesome executions in the electric chair put electrocutions at risk of being declared unconstitutionally cruel and unusual punishment.

But capital defense lawyers have contended that lethal injection, which in Florida and most states is given with a three-drug cocktail, has its own cruelty problems.

They cite a recent study that suggests a painkiller administered first wears off before the third and fatal drug kills the person. That third drug can

cause excruciating pain, the study said, but no one would know because the second drug in the cocktail paralyzes the person.

Earlier this year, executions in Florida were halted while the Supreme Court considered the case of Clarence Hill, condemned for the 1982 shooting death of a Pensacola police officer. Hill's lawyers argued that lethal injection was cruel and unusual, but the court's ultimately rejected his argument and Hill was executed this fall.

Martin McClain, a lawyer who has represented more than 100 death row inmates, called for an investigation into Diaz's execution.

McClain said the state should have disclosed any liver problems in advance and explained its plans for dealing with them.

McClain said he questions if Diaz was given the pain-inducing drug potassium chloride before the anesthetic started working.

Lethal injection had been a subject of legal challenges, including one to the U.S. Supreme Court, which put executions in Florida on hold for much of this year. When those legal maneuvers failed, Gov. Bush began signing death warrants.

Diaz, 55, was the fourth person to be executed this year, the most the state has put to death since six were executed in 2000.

Diaz was condemned for the 1979 shooting death of Joseph Nagy, a topless bar manager in Miami. Nagy was killed during a robbery by three men. The case was unsolved for four years before a girlfriend of Diaz's called police to say he was involved.

Diaz had been sentenced to life in prison in Puerto Rico for another murder but escaped and came to the United States. He also escaped from a prison in Connecticut and tried to arrange an escape from jail in Miami.

Though no one witnessed Diaz pull the trigger, a jury convicted him of Nagy's murder and sentenced him to death.

His defense lawyers challenged his conviction and death sentence, especially after a jailhouse snitch who said Diaz confessed to him recanted his testimony. But courts let the death sentence stand.

Time line

Diaz's death

What happened in the execution chamber as Angel Diaz was put to death Wednesday night:

6:00 p.m.: The curtain opens. Angel Diaz gives a short last statement claiming he is innocent.

6:02: Diaz begins grimacing and seems to speak, though a microphone is off and none of the witnesses can hear him.

6:08: Diaz squints his eyes and juts his chin as if in pain. He continues this for several minutes.

6:12: Diaz's head slips to the right. He coughs several times and appears to shudder.

6:15: His mouth has appeared to widen and his breathing is deep.

6:18: A member of the execution team hands a phone to another member of the team. What they say on the phone is not revealed. Diaz's mouth and chin move as he breathes deeply.

6:24: Diaz's mouth and chin slowly stop moving. His eyes appear fixed.

6:26: His body suddenly jolts. His eyes appear to be opening more widely. Again, a member of the execution team gets on the phone.

6:34: A doctor wearing a blue hood that covers his face enters the execution chamber and checks Diaz's vital signs. The doctor returns a minute later, checks the vital signs again and nods to a member of the execution team.

6:38: A member of the execution team announces that the sentence of Angel Diaz has been carried out. The curtain closes.

Past controversies

May 4, 1990: Smoke, sparks and flames shoot from behind his mask as Jessie Tafero is executed in the electric chair. A synthetic sponge used to conduct electricity into the brain caught fire.

March 25, 1997: Pedro Medina's head catches fire as he is electrocuted. The leather skullcap burned because copper wiring inside it had not been cleaned.

July 8, 1999: Blood appears on the face and shirt front of 344-pound Allen Lee Davis, for whom a larger electric chair was specially built. Photos later show Davis bleeding from the nose and grimacing.

June 8, 2000: The lethal injection of Bennie Demps is delayed 33 minutes while technicians cut his groin and leg searching for a second injection spot. In his final statement he says, "They butchered me back there."

Plaintiff's Exhibit 25

to

Complaint for Declaratory Judgment and Injunctive Relief

Florida Final Commission Report
March 2007

The Governor's Commission on Administration of Lethal Injection

John W. "Bill" Jennings
Senator Victor Crist
Rodney Doss
Harley Lappin
Honorable Stan Morris
Dr. Steve Morris

Representative Dennis Ross
Harry K. Singletary
Dr. Peter Springer
Carolyn Snurkowski
Dr. David Varlotta

Final Report
With
Findings and Recommendations

Presented to the
Honorable Charlie Crist
Governor of Florida
March 1, 2007

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The Governor's Commission on Administration of Lethal Injection

March 1, 2007

INTRODUCTION

On December 13, 2006, the execution of Angel Diaz created concerns whether Florida's lethal injection protocols were being adequately implemented by the Florida Department of Corrections. The amount of time required to effectuate death, eyewitness accounts of the execution and the preliminary autopsy findings prepared by William Hamilton, M.D., the Chief Medical Examiner for the Eighth Circuit, called into question the adequacy of the lethal injection protocols and the Department of Corrections' ability to implement them in a manner consistent with the Eighth Amendment to the United States Constitution.

As a result, then Governor Jeb Bush issued Executive Order 06-260 on December 15, 2006, which created the Governor's Commission on Administration of Lethal Injection to "review the method in which the lethal injection protocols are administered by the Department of Corrections and to make findings and recommendations as to how administration of the procedures and protocols can be revised". The Commission's purpose and mission was limited to evaluating these protocols and not the "policy decisions of the Legislature in enacting a death penalty or the means chosen by the Legislature for implementing the state's death penalty." While limited to evaluating Florida's lethal injection procedures and protocols, the Commission was given broad authority to re-evaluate the lethal injection process including "enforcement of those procedures and protocols."

Chapter 922 is the only legislative expression of Florida's method of execution which, under section 922.105, Florida Statutes (2006), calls for executions to be by either electrocution or lethal injection. Chapter 922 does not delineate with any detail how Florida's death penalty by lethal injection is to be implemented. The promulgation of procedures and protocols for implementing the death penalty by lethal injection was left to the discretion of the Department of Corrections.

Once this Commission was fully comprised by the current Governor, the commissioners set out to fully investigate Florida's method of execution consistent with the mandate of the Executive Order.

THE COMMISSION'S MEETINGS

The Commission met eight times in a manner that was open, transparent and conducive to citizen input on this vital issue consistent with Article I, Section 24(b) of the Florida Constitution and Florida's "Sunshine Act" under Chapter 286 of the Florida Statutes. The Commission first convened on January 29, 2007, and met subsequently on February 5th, 9th, 12th, 19th 24th, 25th, and 28th. During these meetings, numerous witnesses testified before the Commission, pages of documentary evidence were received and public comments, both oral and written, were given. An account of the evidence received by the Commission follows.

January 29th, 2007
The Commission heard testimony from the Following witnesses:
Neal Dupree: The Capital Collateral Regional Counsel for the Southern Region of Florida and attorney for Angel Diaz.
Randall Bryant: Warden of the Florida State Prison.
Randall Polk: Assistant Warden of the Florida State Prison.
William F. Mathews, P.A.: A physician's assistant employed by the Florida Department of Corrections.

February 5th, 2007
The Commission heard testimony from the following witness:
Denise Clark, D.O.: an osteopathic physician trained in vein therapy.

February 9th, 2007
The Commission heard testimony from the following witnesses:
Timothy J. Westveer: Inspector with the Office of Executive Investigations, Internal Affairs Unit, for the Florida Department of Law Enforcement.
Nikolaus Gravenstein, M.D.: An anesthesiologist and professor at the University of Florida.
Primary Executioner: Anonymous testimony from the primary executioner employed by the Florida Department of Corrections.
A Medically Qualified Member of the Execution Team: Anonymous testimony from a medically qualified member of the execution team.
The Commission also received comments from the public:
Carol Weihrer
Gavin Lee
Mark Elliot
Sol Otero

February 12th, 2007
The Commission heard testimony from the following witnesses:
Brenda Whitehead: A correctional specialist employed by the Florida Department of Corrections who witnessed the execution of Angel Diaz.
Bruce A. Goldberger, Ph.D, D.A.B.F.T.: A forensic toxicologist employed at the University of Florida who conducted a blood analysis on samples taken from Angel Diaz.
Mark Heath, M.D.: An anesthesiologist employed by Columbia University.
William F. Hamilton ,M.D.: The Medical Examiner for the Eighth District of Florida who performed the autopsy on Angel Diaz.

February 19th, 2007
The Commission heard testimony from the following witnesses:
Mark Dershwitz, M.D., Ph.D.: An anesthesiologist with a Ph.D. in Pharmacology with the Department of Anesthesiology at the University of Massachusetts.
George B. Sapp: Assistant Secretary for Institutions for the Florida Department of Corrections.
James R. McDonough: Secretary of the Florida Department of Corrections.
A Medically Qualified Member of the Execution Team: Anonymous testimony from a medically qualified member of the execution team.
Bonita Sorenson, M.D.: An employee of the Florida Department of Health and a member of the December 15, 2006, Department of Corrections' Task Force.
Maximillian J. Changus: Attorney supervisor in the Office of General Counsel for the Florida Department of Corrections and member of the December 15, 2006, Department of Corrections' Task Force.
The Commission also received comments from the public:
Mary Berglund

February 24th, 2007
The Commission conducted a workshop session concerning this report.

February 25th, 2007
The Commission conducted a workshop session concerning this report.

February 28th, 2007
The Commission met telephonically by means of a conference call and conducted a workshop session concerning this report. As a result of this meeting, the final draft of this report was written and approved.

AREAS OF INQUIRY

Much of the Commission's work focused on the execution of Angel Diaz on December 13, 2006. This was aided by the *Summary of Findings of the Department of Corrections' Task Force Regarding the December 13, 2006, Execution of Angel Diaz* which was submitted on December 20, 2006, to James R. McDonough, Secretary of the Florida Department of Corrections. In summary, the task force report offered adequate details surrounding the execution of Angel Diaz, finding that several protocols were not followed that day.

The Commission built on this foundation by calling several individuals of the execution team from the Department of Corrections responsible for carrying out the lethal injection protocols during the execution of Angel Diaz. This proved to be a difficult task, complicated by the executioners' desire for anonymity under Florida Statues and a number of medical personnel requests to maintain their anonymity. The task was also complicated because the Commission lacked the ability to subpoena witnesses.

Further restraints were placed on the Commission by the very nature of the lethal injection procedure itself. The use of medical personnel in capital punishment presents a profound dilemma. Every medical organization that has commented has taken a similar position. Medical personnel are prohibited from participating in executions and rendering technical advice. This prohibition hindered the Commission's ability to gather information. Many members of the medical profession were reluctant to appear in front of the Commission and were likewise reluctant to testify in the context of lethal injection. The Commission was also concerned that this prohibition may limit the best advice, the latest technology and the most capable individuals to enact lethal injection. This issue also limited the medical members of the Commission from offering advice or recommending suggestions during this process. Although the execution by lethal injection process is not a medical procedure; the process does require some qualified medical personnel to successfully accomplish a humane and lawful execution.

Both medical and legal ethics regulating each profession limited inquiry of those commissioners affiliated with either profession. These Commission members appreciate the other Commissioners' understanding of these ethical issues.

Despite the above issues, the Commission was able to convene in a manner that was collegial, deliberate and dedicated to the mandate bestowed upon it by the Governor. As a result, the Commission is proposing several findings and recommendations to be considered by those who create policy and those charged with its implementation.

LEGAL OVERVIEW

Lethal injection is currently the method of execution used by 37 of the 38 capital punishment states. The Florida Supreme Court, like other State and federal courts, has regularly rejected arguments that lethal injection as a method of execution is cruel and unusual. *Sims v. State*, 754 So. 2d 657 (Fla. 2000); *Rolling v. State*, 944 So. 2d 176, 179 (Fla. 2006); *Rutherford v. State*, 926 So. 2d 1100, 1113-14 (Fla. 2006); *Hill v. State*, 921 So. 2d 579, 582-83 (Fla. 2006); *Diaz v. State*, 945 So. 2d 1136 (Fla. 2006). No court thus far has held that lethal injection is cruel and unusual punishment in violation of the Eighth Amendment of the United States Constitution. The courts and legal articles acknowledge that humane concerns formed a large part of the motivation in adopting lethal injection as the presumptive method of execution in most states, and it has been observed that "with lethal injection, we know exactly what the person is going through because it's exactly what someone undergoing surgery experiences." Jonathan S. Abernethy, *The Methodology of Death: Re-examining the Deterrence Rationale*, 27 Colum. Hum. Rts. L. Rev. 379, 414 (1996).

The lethal injection procedure used by most states, originated in Oklahoma when Senator Bill Dawson asked Dr. Stanley Deutsch, then chair of the Anesthesiology Department at Oklahoma University Medical School, to recommend a method for executing prisoners through the administration of intravenous drugs. In a responsive letter, Dr. Deutsch recommended the administration of an "ultra short acting barbiturate" to induce unconsciousness, followed by the administration of a neuromuscular blocking drug to induce paralysis and death. See Deborah W. Denno, *When Legislatures Delegate Death: The Troubling Paradox Behind State Uses of Electrocution and Lethal Injection and What It Says About Us*, 63 Ohio St. L.J. 63, 95-97 (2002). Shortly thereafter, in 1977, Oklahoma became the first state to adopt lethal injection as an execution method, employing the protocol described in Dr. Deutsch's letter. See Rebecca Brannan, *Sentence and Punishment: Change Method of Executing Individuals Convicted of Capital Crimes from Electrocution to Lethal Injection,* 17 Ga. St. U. L. Rev. 116, 121 (2000). The first lethal injection execution occurred in Texas in 1982. Christina Michalos, *Medical Ethics and the Execution Process in the United States of America*, 16 Med. & L. 125, 126 (1997).

The Eighth Amendment prohibits punishments that are "incompatible with 'the evolving standards of decency that mark the progress of a maturing society.' " *Estelle v. Gamble*, 429 U.S. 97, 102, 50 L. Ed. 2d 251, 97 S. Ct. 285 (1976) (quoting *Trop v. Dulles*, 356 U.S. 86, 101, 2 L. Ed. 2d 630, 78 S. Ct. 590 (1958)(*plurality opinion*)). In the context of executions, the Eighth Amendment prohibits punishments that "involve the unnecessary and wanton infliction of pain," *Gregg v. Georgia*, 428 U.S. 153, 173, 49 L. Ed. 2d 859, 96 S. Ct. 2909 (1976), "involve torture or a lingering death," *In re Kemmler*, 136 U.S. 436, 447, 34 L. Ed. 519, 10 S. Ct. 930 (1890), or do not accord with "the dignity of man, which is the basic concept underlying the Eighth Amendment," *Gregg*, 428 U.S. at 173 (internal quotation marks and citation omitted). The Ninth Circuit, for example, has held that execution by hanging under the State of Washington's protocols did not constitute cruel and unusual punishment based on the district court's findings that the "mechanisms involved in bringing about unconsciousness and death in judicial hanging occur extremely rapidly, that unconsciousness was likely to be immediate or within a matter of

seconds, and that death would follow rapidly thereafter." *Campbell v. Wood*, 18 F.3d 662, 687 (9th Cir. 1994) (*en banc*); Note: *Louisiana ex rel. Francis v. Resweber*, 329 U.S. 459 (1946).

The Eighth Amendment prohibits punishments that involve the unnecessary and wanton inflictions of pain, or that are inconsistent with evolving standards of decency that mark the progress of a maturing society. *Estelle v. Gamble*, 429 U.S. 97, 102-03 (1976); *Furman v. Georgia*, 408 U.S. 238, 269-70 (1972); *Gregg v. Georgia*, 428 U.S. at 173 (opinion of Stewart, Powell, Stevens, JJ.). Punishments are cruel when they involve torture or a lingering death. *In re Kemmler*, 136 U.S. 436, 447 (1890). A method of execution is considered to be cruel and unusual punishment under the Federal Constitution when the procedure for execution creates "a substantial risk of wanton and unnecessary infliction of pain, torture or lingering death". *Gregg v. Georgia, supra.* In reviewing whether the method of execution is a constitutional violation, courts must consider whether it is contrary to evolving standards of decency that mark the progress of a maturing society. See *Baze v. Rees*, 2006 Ky. LEXIS 301 (Ky. 2006); *Trop v. Dulles*, 356 U.S. 86 (1958); *Roper v. Simmons*, 543 U.S. 551 (2005); *Solem v. Helm*, 463 U.S. 277, 292 (1983).

The United States Supreme Court has analyzed challenges to a method for carrying out the punishment, as to: (1) whether a method of execution comports with the contemporary norms and standards of society, ("the clearest and most reliable objective evidence of contemporary values is the legislation enacted by the country's legislatures." *Penry v. Lynaugh*, 492 U.S. 302, 331 (1989)); (2) whether a method of execution offends the dignity of the prisoner and society; (3) whether a method of execution inflicts unnecessary physical pain; and (4) whether a method of execution inflicts unnecessary psychological suffering. *Weems v. United States*, 217 U.S. 349, 373 (19–20). In considering objections to a particular execution method, the "methodology review focuses more heavily on objective evidence of the pain involved in the challenged method." *Campbell*, 18 F.3d at 682. To that end, "the objective evidence, though of great importance, [does] not 'wholly determine' the controversy, 'for the Constitution contemplates that in the end our own judgment will be brought to bear on the question of the acceptability of the death penalty under the Eighth Amendment.' " *Atkins v. Virginia*, 536 U.S. 304, 312, 153 L. Ed. 2d 335, 122 S. Ct. 2242 (2002) (quoting *Coker*, 433 U.S. at 597). See *Beardslee v. Woodford,* 395 F.3d 1064, 1070-71 (9th Cir. 2005).

These factors dictate that punishments may not include "torture, lingering death, wanton infliction of pain, or like methods." *Estelle v. Gamble*, 429 U.S. 97, 102 (1976); *In re Kemmler*, 136 U.S. 436, 447 (1890), but the Court has likewise held that the afore-noted does not contemplate a totally painless execution.

FINDINGS AND RECOMMENDTIONS

As a result of the review of testimony, written reports, Commission transcripts, articles and documents submitted to the Commission, it is the conclusion of the Commission that there are conflicts that the Commission believes that it has resolved that lead to our findings and recommendations. Examples of these resolved conflicts are as follows:

1. The execution team failed to ensure that a successful IV access was maintained throughout the execution of Angel Diaz.
2. Failure of the execution team to follow the existing protocols in the delivery of the chemicals.
3. The protocols as written are insufficient to properly carry out an execution when complications arise.
4. Failure of the training of the execution team members.
5. Failure of the training to provide adequate guidelines when complications occur.
6. There was a failure of leadership as to how to proceed when a complication arose in the execution process.
7. There was inadequate communication between the execution team members and the warden who was not informed of the problem and the changes implemented.

However, the Commission discovered during its investigation that there are other conflicts which remain unresolved. Examples of these unresolved conflicts are as follows:

1. Observations of the inmate during the execution process, including movement of the body, facial movements and verbal comments
2. Conflicting testimony of the expert medical witnesses regarding the impact of drugs, absorption of drugs, etc.

FINDINGS

1. Execution of inmate Diaz took 34 minutes, which was substantially longer than in any previous lethal injection execution in Florida. This was reflected in the testimony of all witnesses or participants in the Diaz execution, who had also witnessed prior executions by lethal injection.

2. The preponderance of physical evidence demonstrates that venous access at the time of execution was improperly maintained and administered. This was derived from the testimony of William F. Mathews P.A., Dr. William F. Hamilton, M.D. and FDLE Inspector Timothy J. Westveer.

3. The Department of Corrections failed to follow their August 16, 2006 Protocols, which resulted in the administration of the lethal chemicals to inmate Diaz at least in part subcutaneously. This was derived from the December 20, 2006, Department of Corrections report and testimony of William F. Mathews, P.A., Dr. William F. Hamilton, M.D. and FDLE Inspector Timothy J. Westveer.

4. There was inadequate training as to the August 16, 2006 Protocols. This was derived from testimony of the Primary Executioner, FDLE Inspector Westveer, and a Medically Qualified Member of the Execution Team.

5. Failure to adhere to Department of Corrections Protocol 14 (e) and the fact that this protocol inadequately provides direction when changing to the secondary site (B), that the lethal chemicals are to commence from the second rack (B) in the order described in protocol 14 (d). In this instance, the sequence in which the drugs were actually administered and the rack from which they were taken, created the opportunity, with or without the venous access failure, to allow the second chemical, pancuronium bromide, and the third chemical, potassium chloride, to take affect before the first drug, sodium pentothal, was able to fully take effect.

6. Because of the findings above, it is impossible for the Commission to reach a conclusion as to whether inmate Angel Diaz was in pain.

RECOMMENDATIONS: (see attachment (A) for The Physicians' Statement)

The Commission recommends that the Florida Department of Corrections, in consultation with other entities in the State of Florida, consider modifications to its written policies and procedures:

a. Related to the implementation of lethal injections carried out by officers and agents of the State of Florida;

b. Implement written policies, practices, and procedures related to ensuring optimal supervision and management of every lethal injection procedure by the appropriate officials, including the selection of personnel involved in each part of the lethal injection procedure;

c. Implement a comprehensive, systematic procedure for ensuring that persons selected to perform these official duties related to carrying out lethal injections are suitably qualified and trained to perform the assigned duties.

A. PROTOCOLS, PROCEDURES, CHECKLISTS AND DOCUMENTATION:

1. EXECUTION PROTOCOL

a. Develop and implement written procedures that clearly establish the chain of command in the lethal injection process, to include that the Warden (or other such person designated by the Secretary, Florida Department of Corrections) has final and ultimate decision making authority in each and every aspect of the lethal injection process.

b. Develop and implement procedures to insure that there is effective two-way audio communication between the execution team members in the Chemical Room and the execution team members in the Death Chamber (for example, a dedicated frequency should be considered).

2. **DOCUMENTATION OF ACTIONS AND PROCEDURES:**

a. Develop and implement procedures which require that any step or function which is required to be documented on a checklist or other document(s) be verified by utilization of the execution team member's initials or other identifier.

b. Develop and implement procedures to monitor and document all stages of the lethal injection process, including the administration of the lethal chemicals.

c. Change the designation of the lines used for the IVs and racks holding the lethal chemicals so that one has a number designation and the other has a letter designation.

d. Implement a change so that the primary FDLE agent will be located in the Chemical Room, and the agent's responsibilities are to include documenting and keeping a detailed log as to what occurs in the Chemical Room at a minimum of 30 second intervals. The log should be available at the post execution debriefing.

e. A second FDLE agent should be added to the procedures. This agent will be located in the Witness Room, and will be responsible for keeping a detailed log of what is occurring in the Death Chamber at a minimum of 30 seconds intervals. The log should be available for the post execution debriefing.

f. The duties of both the primary and secondary FDLE Agent should be defined in detail by the Department of Corrections and the Florida Department of Law Enforcement.

g. The debriefing process following an execution should be a formal process that details who should participate and what should be covered. A written record of the debriefing should be produced.

3. **LETHAL INJECTION CHEMICAL PREPARATION**

Develop and implement a procedure to ensure that each syringe used in the lethal injection process is appropriately labeled, including the name of the chemical contained therein.

4. **ESTABLISHING INTRAVENOUS (IV) ACCESS:**

a. Develop and implement a procedure which requires that the condemned inmate be individually assessed by appropriately trained and qualified persons at a minimum of one

week prior to the scheduled execution. The results of this examination shall be documented in the appropriate record.

b. Develop and implement a process to determine the most suitable method of venous access (peripheral or femoral) for the lethal injection process, considering the technical skills of available personnel and the individual circumstances of the condemned inmate.

c. Develop and implement procedures for gaining venous access to the condemned inmate which do not require movement of the condemned person after venous access is obtained. These procedures should optimize the length of tubing, so that it is as short as possible.

d. Develop and implement procedures to ensure that unexpected event(s) are identified, including inability to access a venous site, problems with tubing, apparent consciousness of the inmate, etc. In the event that an above describe event(s) occurs, the execution process should be interrupted, appropriate persons advised, and corrective steps discussed and implemented before resuming the execution process.

e. Develop and implement procedures to allow for the monitoring of the condemned inmate's restraints and the adhesive tape to eliminate the risk of restricting the flow of lethal chemicals through the IV line.

f. Develop and implement procedures to insure that a closed circuit monitoring of the inmate in the Death Chamber by the execution team members in the Chemical Room. This should include at a minimum the condemned inmate's face and IV access points. No recordings by the closed circuit monitor should be made.

5. ADMINISTRATION OF LETHAL CHEMICALS:

a. Develop and implement procedures to ensure that the condemned inmate is unconscious after the administration of the first lethal chemical, sodium pentothal, before initiating administration of the second and third lethal chemicals. Under no circumstances should the execution continue with the second and third lethal chemical without the Warden's authorization.

b. Develop and implement procedures to ensure that if at any stage of the administration of the lethal chemicals a decision is made to change IV sites or utilize a secondary site, that the entire lethal chemical administration process is re-initiated from the beginning (syringe # 1{sodium pentothal}), unless the Warden, in consultation with available medical staff, determines that the process may be re-initiated at a different stage.

B. DEVELOPMENT OF COMMAND STRUCTURE AND INFLUENCE AND SELECTION OF PERSONNEL INVOLVED IN THE LETHAL INJECTION PROCESS:

1. Develop and implement written procedures that clearly establish and define the role of each person in the lethal injection process, including the duties required of the position, the expected outcome of each duty or function to be observed or performed, the necessity for compliance with established procedures, that person's responsibility to perform duties as set forth in the protocol or procedure, and to provide necessary information to supervisory level personnel as is needed or required.

2. Consider limiting appointment of persons as members of the execution team, who are otherwise responsible for the routine care and custody of condemned inmates.

3. Consider assigning as few individuals to the Death Chamber as possible to enhance an unobstructed view of the condemned inmate.

4. Develop and implement clearly defined duties for the two FDLE agents who should document what occurs during the execution.

5. Establish that the Warden is responsible for each and every decision during the execution, after receiving input from other members of the execution team.

C. DEVELOPMENT AND IMPLEMENTATION OF TRAINING PROCEDURES FOR PERSONS INVOLVED IN THE LETHAL INJECTION PROCESS:

1. Develop and implement a training program for all persons involved in the lethal injection process. This training program should consider including a requirement for periodic exercises involving all team members and the representative(s) from FDLE. If not feasible for persons to be involved in the periodic training, a procedure should be established to ensure that the person performing a given function is proficient to perform that task. The training program should be documented as to the participants (by name or other identifier) and the function rehearsed. A procedure should be developed and implemented in which each training exercise is critiqued at all levels to address contingencies and the response to those contingencies.

2. Develop and implement procedures which review foreseeable lethal injection contingencies and formulate responses to the contingencies which are rehearsed in the periodic training.

3. Develop and implement written policies, practices, and procedures requiring all team members who participate in an actual execution to have completed, to the satisfaction of the Warden or designee, any and all training necessary to ensure the team member is qualified to perform the specific function or task in a lethal injection.

D. MISCELLANEOUS RECOMMENDATIONS RELATED TO THE FLORIDA LETHAL INJECTION PROCESS:

1. Develop and implement procedures to ensure that a member of the execution team is able to communicate in the primary language of the inmate being executed.

2. Install additional clocks and any additional necessary lighting in the Death Chamber.

3. It is the Commission's opinion that an agency following the procedures framed in our recommendations can carry out an execution utilizing the three proscribed chemicals identified in the Florida Department of Corrections' August 16, 2006, protocol within the existing parameters of the Constitution. However, the Commission suggest, that the Governor have the Florida Department of Corrections on an ongoing basis explore other more recently developed chemicals for use in a lethal injection execution with specific consideration and evaluation of the need of a paralytic drug like pancuronium bromide in an effort to make the lethal injection execution procedure less problematic.

Respectfully Submitted,

The Commission

CHAIRMAN'S CLOSING COMMENTS

I feel it is important to recognize several individuals for their contribution to the Commission's effort in fulfilling the task assigned to it by the Governor. I wish to thank Governor Crist for giving me the opportunity to serve the citizens of the State of Florida. Next, I wish to recognize the enormous sacrifice of time and energy by each and every commissioner. Without their dedication to this task, it would have been impossible for the Commission to have accomplished its work in a timely manner. Additionally, Gerald Curington, Deputy Chief of the Governor's Legal Staff, was instrumental in assisting the Commission in navigating the early fiscal and structural requirements. Kathy Torian, Governor's Deputy Press Secretary, cheerfully provided all the meeting notifications to the news media on what always seemed like short notice. A special thanks to Max Changus, Deputy Council for the Department of Corrections, who was constantly required to produce Department of Corrections' personnel to testify before the Commission with only minimum notice. The Florida Bar's willingness in providing a meeting room, and daily assistance with the little details was of significant assistance to the Commission in its work. I wish to voice my appreciation to Pat Gleason of the Governor's staff, who was continually providing much appreciated advice on the Florida Sunshine Law requirements. Finally, I would like express my appreciation to the members of my office, who were constantly required to assist me on this project, while continuing to perform their normal duties. In particular, I wish to mention the efforts of Peter Cannon of my staff, who worked tirelessly behind the scenes, so that the Commissioners had all of the materials, as well as coordinating the witnesses and producing the meeting agendas. I hope that by acknowledging these individuals that it is apparent to everyone that this was a group effort, which was made possible by the dedication, congeniality and perseverance of everyone, but especially the Commission members.

APPENDIX A

The Physicians' Statement

The American Medical Association has maintained a Code of Ethics for Physicians since 1847. This Code is regularly updated and revised and is currently relevant, it is also extremely specific when addressing physician participation in legal executions, including lethal injection. According to the Code a physician is prohibited from participating in an execution, observing an execution, and assisting in an execution including providing technical advice. Indeed, countless organizations representing medical and clinical professions have adopted a similar position.

When asked to participate in the Lethal Injection Commission for the State of Florida we physicians were faced with a dilemma. Should we decline the request of the State and let others decide the direction of the Commission's actions, or should we involve ourselves at the risk of being labeled unethical physicians? Ultimately we agreed to serve as we trust that the State neither wants to create unethical physicians, nor would it be interested in consulting physicians willing to operate outside of their ethical boundaries.

It is our contention from testimony of witnesses and interacting with the other Commission members that authoritative bodies in this country are tending to require more sophisticated medical techniques and personnel to administer the lethal injection. This is a legal and societal problem, not a medical one. A physician must always act in the best interest of the individual as they apply their knowledge and skill; otherwise they risk damage to the trust that patients place in their physician. Maintaining a patient's trust is paramount. A physician must always place the individual's interest above all else. Physician participation in lethal injection places this trust in jeopardy.

We physicians are aware that the Commission rendered specific recommendations in its report. We have refrained from rendering our medical expertise or consent to these specific recommendations. After hearing the testimony of the witnesses and through our deliberations, it is of great concern to us that this task may require the use of medical personnel. The participation of these individuals requires them to operate outside the ethical boundaries of their profession. This is a unique situation. We know of no other occasion where the State employs the services of individuals operating outside of the ethical boundaries of their profession. This is not a desirable situation. It is also our conclusion that because of the above noted points, the inherent risks, and therefore the potential unreliability of lethal injection cannot be fully mitigated.

Respectfully,

Steve Morris, M.D.

Peter Springer, M.D., F.A.C.E.P.

Dave Varlotta, D.O.

APPENDIX B

February 28, 2007

Mr. John W. "Bill" Jennings
Chairman
Governor's Commission on
Administration of Lethal Injection
3801 Corporex Drive, Suite 210
Tampa, Florida 33619

RE: Objection to Commission Statement

Dear Chairman:

I must first observe that it has been a great pleasure to work with you and the other esteemed members of the Governor's Commission on Administration of Lethal Injection. While the task assigned the Commission was serious and challenging, getting to know and work with the Commission members was rewarding and educational.

I write this letter however, to register my concerns that, in questioning whether the lethal drugs utilized in Florida's method of execution should be evaluated, the Commission has moved beyond the mission and purpose assigned by Governor Bush in Executive Order 06-260. That Order set forth that the Commission's "purpose and mission shall be limited to evaluating Florida's lethal injection procedures and protocols, including enforcement of those procedures and protocols, and shall not extend to re-evaluating the policy decisions of the Legislature in enacting a death penalty or the means chosen by the Legislature for implementing the state's death penalty."

While the Commission clearly addressed a number of very important issues regarding needed enhancements of the existing protocols and shoring up identified lapses in the adherence to the existing protocols, the issues identified by the Commission dealt with personnel matters, the failure to properly deliver the lethal drugs and the failure to follow current protocols once a problem was detected, not the use of particular drugs set forth in the Department of Corrections' protocols.

Because I believe the Commission was not authorized to expand its charge beyond the Governor's Executive Order, I must respectfully voice my dissent regarding the overreaching of the Commission's remarks on this point.

Sincerely yours,

Carolyn M. Snurkowski

Plaintiff's Exhibit 26

to

Complaint for Declaratory Judgment and Injunctive Relief

Robert Glen Coe
Autopsy Report

- WARDEN Ball
- Ann Campbell

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE MEDICAL EXAMINER
84 HERMITAGE AVENUE; NASHVILLE, TN 37210-2110
(615) 862-8940

State # —
County # 00-0956

REPORT OF INVESTIGATION BY COUNTY MEDICAL EXAMINER

IDENT: Robert G Coe RACE: White SEX: Male AGE: 44 Years

HOME ADDRESS: Riverbend Maximum Security 7475 Cockrill Bend Road; Nashville TN MARITAL STATUS: Single

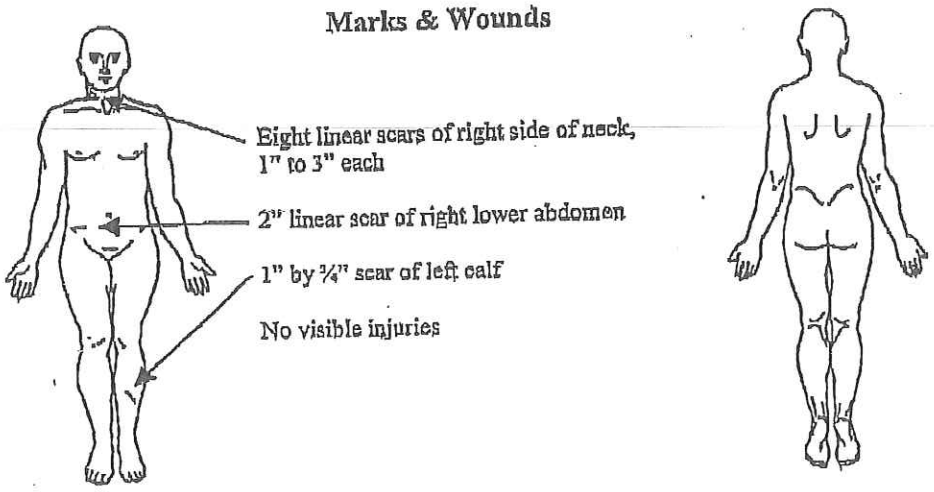
OCCUPATION: Prisoner SS#: DATE OF BIRTH: [redacted] 1956

TYPE OF DEATH: Violent ( ) Casualty ( ) Suicide ( ) Suddenly when in apparent health ( )
Found Dead ( ) In Prison (•) Suspicious, unusual or unnatural ( ) Cremation ( )
Motor Vehicle Accident ( ) Check One Driver ( ) Passenger ( ) Pedestrian ( ) Unknown ( )
COMMENT: Death by lethal injection

AGENCY INVESTIGATOR AND COMPLAINT #: MEO

DESCRIPTION OF BODY: Clothed (•) Unclothed ( ) Partly Clothed ( ) Circumcised? (_)
Eyes: Brown Hair: Gray Mustache: Yes Beard: Yes
Weight: 179.5 (Lbs.) Length: 69 (In.) Body Temp: Warm to cool
Rigor? (•) Lysed? (_) Livor Color Purple Fixed? (_)

Marks & Wounds



Probable Cause of Death	Manner Of Death	Disposition Of Case
Acute intoxication by the combined effects of pentothal, pavulon and potassium	Accident ( ) Homicide (•) Suicide ( ) Natural ( ) Could Not Be Determined ( ) Pending Investigation ( ) Cremation Approved (_)	Medical Examiner Jurisdiction Refused (_) Autopsy Ordered (•) Toxicology (•) 0567 Responsible For Death Certificate: Medical Examiner(•) Bruce P. Levy, M.D. Other MD ( ) Funeral Home: Pettus-Owen-Wood FH

I declare that after receiving notice of death described herein, I took charge of the body and made inquiries regarding the cause of death in accordance with Section 38-7-101-117 Tennessee Code Annotated and that the information contained herein regarding such death is true and correct to the best of my knowledge and belief.

April 19, 2000
Date

DAVIDSON
County of Appointment

13-1

Signature of County Medical Examiner

01

Personal History: Suicide Attempts (_) Suicide Threats (_) Hobbies, aptitude and skills with firearms, chemicals, etc. (_) Domestic, premarital or marital conflicts (_) Financial or business reverses (_) Social or religious conflicts (_) Legal Difficulties (_) Criminal Record (_) Unemployment (_) Fear of disease (_)
Other (Specify):

Conduct Before Death: Efforts to prevent help (_) Efforts to obtain help (_) Suicide attempt: Admitted (_) Denied (_) Refused to (_) Written declaration of intended suicide (_) Accusations against others (_)
Other (Specify):

	Last Seen Alive	Injury or Illness	Death	Discovery	Medical Examiner Notified	View of Body	Police Notified
Date		04/19/2000	04/19/2000		04/19/2000	04/19/2000	
Time		01:20	01:37		00:00	01:45:00	

	Location	City or County	Type of Premises (hospital, hotel, highway, etc.)
Injury or onset of illness	Riverbend Maximum Security	Nashville	Prison
Death	Riverbend Maximum Security	Nashville	Prison
Viewing of body by Medical Examiner	Riverbend Maximum Security	Nashville	Prison

MEDICAL ATTENTION AND HOSPITAL, INSTITUTIONAL CARE OR HOME HEALTH CARE

Name of Physician or Institution	Address	Diagnoses	Dates

CIRCUMSTANCES OF DEATH

	Name	Address
Found Dead By		
Last Seen Alive By		
Witness to Injury or Illness	Ricky J. Bell, Warden	Riverbend Maximum Security;7475 Cockrill Bend Road Nashville TN 37243-
Witness to Death	Dr. Frank Thomas	
Next of Kin	Billie Mayberry (Sister)	[redacted] Trezevant TN 38258- [redacted]

(36) NARRATIVE SUMMARY OF CIRCUMSTANCES SURROUNDING DEATH

The decedent is a 44 y.o. W/M who executed by lethal injection on this date. A body examination was performed and documentation made with photography. The body was transported to the Forensic Science Center for further examination by the medical examiner and disposition to the funeral home.

Frances M. Wheatley
04/19/2000

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
METROPOLITAN NASHVILLE DAVIDSON COUNTY
Office of Medical Examiner
Forensic Sciences Center
84 Hermitage Avenue
Nashville, Tennessee 37210-2110

CASE: MEC00-0956
County: DAVIDSON

AUTOPSY REPORT

NAME OF DECEDENT: COE, ROBERT GLEN RACE: W SEX: M AGE: 44

HOME ADDRESS: River Bend Maximum Security, Nashville TN

DATE AND TIME OF DEATH: April 19, 2000 at 1:37 a.m.

DATE AND TIME OF AUTOPSY: April 19, 2000 at 8:30 a.m.

COUNTY MEDICAL EXAMINER: Bruce P. Levy, M.D.

ADDRESS: 84 Hermitage Avenue, Nashville, TN 37210-2110

DISTRICT ATTORNEY GENERAL: Honorable Victor S. Johnson

ADDRESS: Washington Square, Suite 500, 222 2nd Avenue North, Nashville, TN 37201-1649.

PATHOLOGIC DIAGNOSES

1. Acute sodium pentothal, Pavulon (pancuronium bromide), and potassium chloride intoxication:
   a) Pulmonary edema (1840 grams together).
2. Atherosclerotic cardiovascular disease:
   a) Coronary artery atherosclerosis, focally marked.
   b) Aortic atherosclerosis, slight.
3. Left pleural fibrous adhesions, focal.
4. Status-post appendectomy, remote.

CAUSE OF DEATH:	Acute intoxication by the combined effects of pentothal, Pavulon and potassium.
MANNER OF DEATH:	Homicide.
CIRCUMSTANCES OF DEATH:	Judicial execution.

I hereby certify that I, Bruce P. Levy, M.D. have performed an autopsy on the body of Robert Glen Coe on the 19th day of April, 2000 at 8:30 am in the Forensic Sciences Center of Davidson County. The purpose of this report is to provide a certified opinion to the County Medical Examiner and District Attorney General. The facts and findings to support these conclusions are filed with the Tennessee Department of Health.

EXTERNAL EXAMINATION

The body is that of a well-developed, well-nourished white male, measuring 69 inches and weighing 179-1/2 pounds, whose appearance is consistent with the reported age of 44 years. Hair is gray with male pattern baldness, 1/2 inch in length. There is a mustache and full beard on the face. There is patchy blanching facial congestion. The irides are brown and the pupils are round. The sclerae are anicteric and the conjunctivae are pale without petechial hemorrhages. The ears, nose and mouth are unremarkable. There is blood-tinged liquid in the nasal and oral cavities. A full upper denture plate is in place. A partial lower denture plate is in place and lower natural teeth are in fair repair.

The anterior torso is symmetric with a protuberant soft abdomen. The posterior torso is unremarkable. The upper and lower extremities are symmetric and unremarkable. External genitalia are those of an uncircumcised male with descended testes.

Rigor mortis is moderate and symmetric. Livor mortis is purple in color, posterior in distribution, and blanching. The body is warm to cool to touch.

THERAPEUTIC PROCEDURES: Intravenous catheters are inserted into superficial blood vessels of both antecubital fossae. Attached to the intravenous catheter on the right is intravenous tubing and a bag of 0.9% normal saline. Attached the intravenous catheter on the left is intravenous tubing, a bag of 0.9% normal saline and a 60 cc. syringe containing a label "7." There is an additional dermal puncture of the right antecubital fossa.

SCARS: There are a series of eight linear scars on the right side of the neck, varying between 1 and 3 inch in length each. There is a 1 x 3/4 inch scar on the anterior/lateral aspect of the left calf. There is a 2 inch linear scar in the right lower quadrant of the abdomen. Subsequent examination revealed the absence of the vermiform appendix.

TATTOOS: On the lateral aspect of the right upper arm is a monochromatic tattoo of a peace sign and "Robert Coe." On the lateral aspect of the left upper arm is a monochromatic tattoo of a sword. On the left upper portion of the back is a monochromatic tattoo "kiss off."

INJURIES: None.

INTERNAL EXAMINATION

HEAD: The scalp is unremarkable without abrasions, contusions, or lacerations. The skull is intact without fractures. The meningeal coverings of the brain are intact without epidural, subdural, or subarachnoid hemorrhages.

The 1430 gram brain is symmetric with an unremarkable gyral pattern. The distribution of cranial nerves at the base of the brain is normal. The cerebral vessels are unremarkable and

normally distributed. Coronal sections through the cerebral hemispheres reveal a normal distribution of gray and white matter without focal lesions. The ventricles are of normal configuration and size. Horizontal sections through the cerebellum and brain stem reveal a normal distribution of gray and white matter without focal lesions.

NECK: There are no hemorrhages into the musculature or soft tissues of the neck. The hyoid, larynx, and trachea are intact without obstructions. The base of the tongue is unremarkable. The cervical vertebrae are palpably intact.

BODY CAVITIES: All organs are in their normal anatomic locations. The right pleural, pericardial, and peritoneal cavities are unremarkable. There are focal fibrous adhesions between the left pleura and the lower lobe of the left lung.

CARDIOVASCULAR SYSTEM: The great vessels are normally distributed without thromboemboli. There are slight atherosclerotic deposits of the aorta.

The 390 gram heart has a smooth, glistening, intact epicardial surface. The right-dominant coronary arteries contain slight to focally marked atherosclerotic deposits. There is a maximal 90 percent occlusion of the left main and left anterior descending arteries. The remainder of the coronary arteries contain less than 50 percent occlusion. The myocardium is homogeneous red-brown without focal lesions. The left and right ventricles are 1.1 and 0.2 cm. in thickness at the lateral walls, respectively, and symmetric. The endocardial surfaces and four cardiac valves are unremarkable. The mitral and tricuspid valves measure 10.3 and 11.0 cm. in circumference, respectively.

RESPIRATORY SYSTEM: The right and left lungs weigh 980 and 860 grams, respectively. The pleural surfaces are glistening and intact. The pulmonary arteries are free of thromboemboli. The bronchi contain frothy fluid, otherwise unremarkable. The parenchyma is pink to tan and fluffy with a moderate quantity of expressed frothy fluid. There are no focal lesions or consolidations.

DIGESTIVE SYSTEM AND LIVER: The esophagus is unremarkable with a sharp gastroesophageal junction. The unremarkable stomach contains approximately 400 ml of tan liquids and fragments of partially digested food including identifiable potato. The duodenum, small intestines and large intestines are unremarkable. The vermiform appendix is absent.

The 2340 gram liver has a smooth, intact capsule. The parenchyma is red-brown, congested and soft without focal lesions. The unremarkable gallbladder contains approximately 10 ml. of bile. The extrahepatic bile ducts are patent and unremarkable. The pancreas is unremarkable.

RETICULOENDOTHELIAL SYSTEM: The 190 gram spleen is unremarkable. There is a normal distribution of unremarkable lymph nodes.

GENITOURINARY SYSTEM: The kidneys weigh 180 grams each. The subcapsular surfaces are smooth. The cortices are of normal thickness with sharp corticomedullary junctions. The calices, pelves, and ureters are patent and unremarkable. The unremarkable urinary bladder contains approximately 120 ml of urine.

The testes, prostate gland and seminal vesicles are unremarkable.

ENDOCRINE SYSTEM: The pituitary, thyroid, parathyroid and adrenal glands are

unremarkable.

MUSCULOSKELETAL SYSTEM: The musculoskeletal system is intact and unremarkable.

TOXICOLOGY: The following specimens are submitted for possible toxicologic analysis: blood, bile, urine and vitreous humor. A separate report will be issued.

HISTOLOGY: The following specimens are submitted for histologic examination: left anterior descending coronary artery, heart, left bronchus, lungs, liver, spleen, kidney, pituitary gland, thyroid gland, adrenal gland and brain. A separate report will be issued.

SUMMARY OF CASE

This 44 year old male underwent a judicial execution by lethal injection.

At autopsy, there were no visible external or internal injuries. Gross examination revealed moderate pulmonary edema and focally marked atherosclerosis of the coronary arteries. Specimens were obtained for toxicology and histology studies.

Histology confirmed the gross pathologic findings. Blood levels of thiopental (sodium pentothal) and its metabolite pentobarbital are both within normal therapeutic concentrations. Blood levels of pancuronium (Pavulon) are well above the levels indicated for medical use.

In my opinion, this person died as a result of an acute combined intoxication by pentothal, Pavulon and potassium. The manner of death is homicide (judicial execution).

Signature _____ Date 8/10/00

Bruce P. Levy, M.D.
Chief Medical Examiner

BPL/lss
T: 04/20/00

OFFICE OF THE MEDICAL EXAMINER
FORENSIC MEDICAL

REPORT OF MICROSCOPICAL EXAMINATION

Name of Deceased: COE, ROBERT GLEN MEC00-0956

Date of Report: June 5, 2000

Left anterior coronary artery: There are complex atherosclerotic plaques with approximately 90 percent narrowing of the lumen. No thrombotic material is present in the lumen.

Heart: The epicardial surfaces are unremarkable. The myocardium shows slight reversible ischemic changes with hypereosinophilia of the cytoplasm and occasional wavy fiber forms. No significant inflammation or myocardial necrosis is identified. The endocardial surfaces are unremarkable.

Left bronchus: Unremarkable.

Lungs: There is vascular congestion in dependent segments. The pulmonary vasculature is otherwise unremarkable. The bronchi are unremarkable. Alveoli show variably atelectatic and hyper expanded segments with scattered large dilated airspaces. Alveolar walls are thin and delicate without significant inflammation. Alveoli contain numerous macrophages with golden-brown granular cytoplasmic deposits.

Liver: Hepatocytes contain a granular amphophilic cytoplasm with scattered clear cytoplasmic vacuoles and scattered golden-brown granular cytoplasmic deposits. Portal areas are unremarkable. There is slight vascular congestion of the hepatic sinusoids, otherwise unremarkable.

Spleen: Red and white pulp are unremarkable. White pulp follicles contain rare active germinal centers.

Kidney: Glomeruli and tubules are unremarkable. There is vascular congestion.

Pituitary gland: Unremarkable.

Thyroid gland: Unremarkable.

Adrenal gland: Unremarkable.

Brain: Sections of the cerebral cortex, hippocampus, cerebellum and brainstem are unremarkable. There are no ischemic, inflammatory or neoplastic changes.

BRUCE P. LEVY, M.D.

AEGIS
ANALYTICAL LABORATORIES, INC.
345 HILL AVENUE, NASHVILLE, TN 37210
Telephone: (615) 255-2400 ■ Facsimile: (615) 255-3030

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 1 of 1
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 07/14/00 10:47

CLIENT # : 00-0956
AEGIS # : 278285
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(42197) VITREOUS ELECTROLYTE PANEL

****

Specimen submitted was analyzed for the seven analytes listed below. Conventional clinical chemistry and/or microelctrode analytical methods were applied in performing these analyses. Specimen will be retained for 366 days after the date of this report.

Glucose
BUN
Sodium
Potassium
Chloride
CO2
Creatinine

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Vitreous

TEST RESULTS: POSITIVE

Glucose: 34 mg/dL

Blood Urea Nitrogen(BUN): 10 mg/dL

Sodium(Na): 160 mmol/L

Potassium(K): 9 mmol/L

Chloride(Cl): 92 mmol/L

Carbon Dioxide: Unable to obtain a valid result.

Creatinine: 1.3 mg/dl

David L Black Ph.D 7/17/00

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

0575

09

AEGIS
ANALYTICAL LABORATORIES, INC
345 HILL AVENUE, NASHVILLE, TN 37210
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David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED :04/19/00
DATE RECEIVED :04/19/00 11:53
DATE REPORTED :04/25/00 14:46

CLIENT # :00-0956
AEGIS # :278282
INSTITUTION :Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(40569) PROFILE - ME 9

****

Specimen was analyzed for the following drugs:

DRUG	DRUG
Acetaminophen	Opiates and Synthetic Narcotics
Amphetamines	Phencyclidine (PCP)
Barbiturates/Sedative Hypnotics	Phenothiazines
Benzodiazepines	Salicylate
Cannabinoids (Urine only)	Tricyclics
Cocaine	

Positive drug results are reported only after confirmation by Gas Chromatography/Mass Spectrometry (GC/MS) or a Forensically acceptable alternative method of analysis.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Urine

TEST RESULTS: NO DRUGS DETECTED

David L. Black Ph.D 4/25/00 ME

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

0576

AEGIS
ANALYTICAL LABORATORIES, INC
345 HILL AVENUE, NASHVILLE, TN 37210
Telephone: (615) 255-2400 ■ Facsimile: (615) 255-3090

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 1 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage Ave
Nashville, TN 37210

(00420) GC/MS BARBITURATES (ZT)

****

Specimen submitted for confirmation was analyzed for Amobarbital, Butalbital Butabarbital, Pentobarbital, Secobarbital, and Phenobarbital using Gas Chromatography/Mass Spectrometry with a reporting threshold of 100 ng/mL. A positive report is issued after comparison to known standard reference material and matching retention time and fragmentation data. Positive specimens will be retained frozen for 366 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: POSITIVE

Pentobarbital: 1090 ng/mL

David L. Black Ph.D

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

11-11

0577

AEGIS
ANALYTICAL LABORATORIES, INC.
345 HILL AVENUE, NASHVILLE, TN 37210
Telelphone: (615) 255-2400 ■ Facsimilie: (615) 255-3030

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 2 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(40250) ETHANOL/VOLATILES

****

Specimen was analyzed for Ethyl Alcohol, Methyl Alcohol, Isopropyl Alcohol, and Acetone using Gas Chromatography. A positive report is issued after comparison to know standard reference material and matching retention time data. Positive specimens will be retained frozen for 366 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: NO DRUGS DETECTED

David L. Black Ph.D. 8/8/00 m

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

18-12

0578

AEGIS
ANALYTICAL LABORATORIES, INC
345 HILL AVENUE, NASHVILLE, TN 37210
Telephone: (615) 255-2400 ■ Facsimilie: (615) 255-3030

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 4 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(42090) THIOPENTAL (PENTOTHAL)

****

Specimen was analyzed for thiopental (Pentothal) by Gas Chromatography/ Mass Spectrometry (GC/MS) techniques. A positive report is issued after comparison to known standard reference material and matching retention time and fragmentation data. Positive specimens will be retained frozen for 366 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: POSITIVE

Thiopental: 10200 ng/mL

David L. Black, Ph.D. 8/4/00

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

18-19

0579

AEGIS
ANALYTICAL LABORATORIES, INC
345 HILL AVENUE, NASHVILLE, TN 37210
Telephone: (615) 255-2400 ■ Facsimile: (615) 255-3030

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 3 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(41787) PANCURONIUM (PAVULON)

****

Specimen was analyzed for pancuronium (Pavulon) by Gas Chromatography/ Mass Spectrometry (GC/MS) techniques. A positive report is issued after comparison to known standard reference material and matching retention time and fragmentation data. Positive specimens will be retained frozen for 365 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: POSITIVE

Pancuronium: 4700 ng/mL

David L. Black, Ph.D. 8/4/00 18-14

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

0580

Plaintiff's Exhibit 27

to

Complaint for Declaratory Judgment and Injunctive Relief

Philip Workman
Autopsy Report

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE MEDICAL EXAMINER
850 R.S. Gass Blvd., Nashville TN 37216-2640
(615) 743-1800
REPORT OF INVESTIGATION BY COUNTY MEDICAL EXAMINER

MEC 07-1561
State Number: 07-19-1041

DECEDENT: Philip Workman
RACE: White **SEX:** Male **AGE:** 56 Years **MARITAL STATUS:**
HOME ADDRESS: 7475 Cockrill Bend Boulevard TDOC ; Nashville , TN

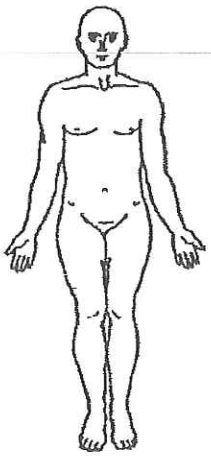
OCCUPATION: Inmate **DATE OF BIRTH:** 01/01/53

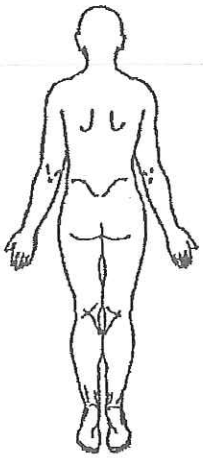
TYPE OF DEATH: ☐ Apparent Natural/Unattended ☐ Motor Vehicle Cremation: N
☐ Casualty ☐ Other
☐ Homicide/Suspected Homicide ☐ Suddenly when in apparent health
☒ In Prison ☐ Suicide

COMMENT: Lethal injection.
AGENCY INVESTIGATOR AND COMPLAINT #: TN Dept. of Corrections

DESCRIPTION OF BODY: ☐ Clothed ☐ Unclothed ☐ Partly Clothed Circumcised?
Eyes: Hair: Mustache: Beard:
Weight: (Lbs.) Length: (In.) Body Temp:
Rigor? Livor Color: Fixed?

Marks & Wounds





Probable Cause of Death	Manner of Death		Disposition Of Case
Acute intoxication by the combined effects of pentothal, pavulon and potassium	☐ Accident ☒ Homicide ☐ Suicide Cremation Approved: N	☐ Natural ☐ Could Not Be Determined ☐ Pending Investigation	Medical Examiner Jurisdiction: Accepte Autopsy Ordered: Autopsy Toxicology: Y Responsible for Death Certificate: ☒ Medical Examiner ☐ Other Physician Funeral Home: Eastland Funeral Home

I hereby declare that after receiving notice of death described herein, I took charge of the body and made inquiries regarding the cause of death in accordance with Section 38-7-101-117 Tennessee Code Annotated and that the information contained herein regarding such death is true and correct to the best of my knowledge and belief.

October 24, 2007
Date

Davidson
County of Appointment

Signature of County Medical Examiner

	Last Seen Alive	Injury or Illness	Death	Discovery	Medical Examiner Notified	View of Body	Police Notified
Date	05/09/2007	05/09/2007	05/09/2007		05/09/2007		
Time	01:30 AM	01:21 AM	01:38 AM		01:40 AM		

	Location	City or County	Type of Premises (hospital, hotel, highway, etc.)
Injury or onset of illness	7475 Cockrill Bend Boulevard	Nashville, TN	Prison
Death	7475 Cockrill Bend Boulevard	Nashville	Prison
Viewing of body by Medical Examiner			

MEDICAL ATTENTION AND HOSPITAL, INSTITUTIONAL CARE OR HOME HEALTH CARE

Name of Physician or Institution	Address	Diagnoses	Dates
			-

(35) CIRCUMSTANCES OF DEATH

	Name	Address
Found Dead By		
Last Seen Alive By	Warden Ricky Bell	7475 Cockrill Bend Boulevard ; Nashville, TN 37209
Witness to Injury or Illness	Warden Ricky Bell	7475 Cockrill Bend Boulevard ; Nashville, TN 37209
Witness to Death	Dr. Frank Thomas	
Next of Kin	Terry Workman	368 Pleasure Ridge Road ; Cadiz, KY 42211

(36) NARRATIVE SUMMARY OF CIRCUMSTANCES SURROUNDING DEATH
Reportedly this 53 y.o. W/M was an inmate with the Tennessee Department of Corrections who had his death sentence carried out on this date and death was pronounced at the site at 01:38. The body was photographed on the execution table in the execution chamber prior to removal of the body by Correctional Officer's and Middle Tennessee Removal Service personnel Chris Moss. The body was next placed in the transport van and escorted by Tennessee Highway Patrol Officer's to the Center for Forensic Medicine for an examination by the medical examiner. Lance V. Long 05/09/2007

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE STATE MEDICAL EXAMINER
Center for Forensic Medicine
850 R.S. Gass Blvd.
Nashville, Tennessee 37216-2640

CASE: MEC07-1561
County: DAVIDSON

AUTOPSY REPORT

NAME OF DECEDENT: WORKMAN, PHILLIP **RACE:** W **SEX:** M **AGE:** 56

HOME ADDRESS: TDOC, Nashville TN

DATE AND TIME OF DEATH: May 9, 2007 at 1:38 a.m.

DATE AND TIME OF AUTOPSY: May 19, 2007 at 8:00 a.m.

COUNTY MEDICAL EXAMINER: Bruce P. Levy, M.D.

ADDRESS: 850 R.S. Gass Blvd., Nashville, TN 37216-2640

DISTRICT ATTORNEY GENERAL: Honorable Victor S. Johnson

ADDRESS: Washington Square, Suite 500, 222 2nd Avenue North, Nashville, TN 37201

PATHOLOGIC DIAGNOSES

1. Lethal injection:

   a. Intravenous catheters placed in each antecubital fossa.
   b. Dermal punctures of both upper extremities.
   c. Toxicology positive for:

      1) Thiopental (18,900 ng/ml heart blood).
      2) Pentobarbital (615 ng/ml heart blood).
      3) Pancuronium (630 ng/ml heart blood).
      4) Potassium (>9 mmol/L vitreous).

CAUSE OF DEATH: Acute intoxication by the combined effects of pentothal, pavulon and potassium

MANNER OF DEATH: Homicide

CIRCUMSTANCES OF DEATH: Judicial execution by lethal injection

---

I hereby certify that I, Bruce P. Levy, M.D. have performed an autopsy on the body of Philip Workman on the 19th day of May 2007 at 8:00 a.m. in the State of Tennessee Center for Forensic Medicine. The purpose of this report is to provide a certified opinion to the County Medical Examiner and District Attorney General. The facts and findings to support these conclusions are filed with the Tennessee Department of Health.

EXTERNAL EXAMINATION

The body is that of a well-developed, well-nourished white male, measuring 67 inches and weighing 207-1/2 pounds, whose appearance is consistent with the reported age of 53 years. The head hair is brown and gray in color with male pattern baldness, measuring a maximum of approximately 6 inches in length. There is a mustache and goatee on the clean-shaven face. The irides are dark with cloudy corneas. The conjunctivae are congested, left greater than right, without petechiae. The ears are unremarkable. The nasal septum is deviated towards the right. The mouth is unremarkable and does not contain any significant quantity of foreign material. Upper and lower denture plates are in place.

The anterior torso is symmetric with a very slightly protuberant soft abdomen. The posterior torso is unremarkable. There is a 1-3/4 x 1 inch patch of slightly pigmented skin on the left middle portion of the back. The upper extremities are symmetric and unremarkable. The lower extremities are symmetric with very slight superficial varicosities. There is marked peripheral cyanosis. External genitalia are those of a circumcised male with descended testes. There are scattered pigmented moles on the body.

Rigor mortis is full and symmetric. Livor mortis is red purple in color, posterior in distribution, and fixed. The body is cold to touch. There is slight drying artifact of scrotum and focal areas of superficial skin slipping.

THERAPEUTIC PROCEDURES: None.

SCARS: There is a 1/2 inch area of scarring to the right of the umbilicus. There is a 2-1/2 inch linear scar on the left lower portion of the back.

There are two 1/4 inch scars on the anterior aspect of the right upper arm near the right antecubital fossa. There are multiple areas of scarring within the right antecubital fossa that measure between 1/4 inch and 1/2 inch in dimension each. There are scattered small linear scars in the right radial area that measure between 1/4 inch and 1/2 inch in length each. There are scattered small scars on the dorsum of the right hand and posterior forearm.

There is a 3/8 inch linear scar in the left antecubital fossa. There is a 3/8 inch linear scar on the anterior aspect of the left forearm. There is a 1/4 inch linear scar on the thenar eminence of the left hand. There are scattered small scars on the dorsum of the left hand and posterior forearm.

There is a 3/4 x 1/2 inch scar on the anterior aspect of the right knee.

There is a 3/16 inch circular pigmented scar with hyperpigmented rims and a hypopigmented center on the anterior aspect of the left calf.

TATTOOS: None.

INJURIES:

LETHAL INJECTION: Intravenous catheters are inserted into superficial veins through dermal punctures of both antecubital fossae. Two additional dermal punctures are noted within the right antecubital fossa. A single dermal puncture is noted on the anterior aspect of the left forearm near the left antecubital fossa.

OTHER SUPERFICIAL INJURIES: There is a 1/8 inch abrasion on the posterior aspect of the proximal phalanx of the thumb of the right hand. There is a 1/8 x 1/16 inch abrasion of the cuticle of the second finger of the left hand.

The above injuries, having been described, will not be repeated.

INTERNAL EXAMINATION

HEAD: The scalp is unremarkable without abrasions, contusions or lacerations. The skull is intact without fracture. The meningeal coverings of the brain are intact without epidural, subdural or subarachnoid hemorrhages.

The brain is symmetric with an unremarkable gyral pattern over the cerebral hemispheres. There are no visible injuries on the surface of the brain.

NECK: There are no hemorrhages into the musculature or soft tissues of the neck. The hyoid, larynx, and trachea are palpably intact. The cervical vertebrae are palpably intact.

BODY CAVITIES: All organs are in their normal anatomic locations. The pleural, pericardial, and peritoneal cavities have smooth and glistening surfaces. Typical quantities of translucent fluid are present within the body cavities.

CARDIOVASCULAR SYSTEM: The great vessels are normally distributed. There are no palpable clots in the pulmonary arteries. The aorta has no palpable calcifications or abnormal dilations.

The heart has a smooth, glistening, intact epicardial surface. It is not apparently enlarged or dilated. The coronary arteries do not have palpable calcifications.

RESPIRATORY SYSTEM: The right and left lungs are normally lobated. The pleural surfaces are glistening and intact with slight to moderate black anthracotic pigment deposits. The lung parenchyma is well aerated without palpable masses or consolidations. There is vascular congestion in dependent segments.

DIGESTIVE SYSTEM AND LIVER: The esophagus, stomach, duodenum, small intestines, appendix, and large intestines are unremarkable on serosal surfaces without palpable abnormalities.

The liver is normal in size with a slightly firm and irregular capsule. The parenchyma is red-brown in color. The unremarkable gallbladder contains approximately 8 ml. of bile. The extrahepatic bile ducts are unremarkable. The pancreas is unremarkable except for autolysis.

RETICULOENDOTHELIAL SYSTEM: The spleen is normal in size and unremarkable. There

is a normal distribution of unremarkable lymph nodes. The thymus gland is involuted.

GENITOURINARY SYSTEM: The kidneys are normal in size. The subcapsular surfaces are smooth. The unremarkable urinary bladder contains approximately 20 ml. of urine.

ENDOCRINE SYSTEM: The thyroid and adrenal glands are normal in size without palpable masses or nodularity.

MUSCULOSKELETAL SYSTEM: The musculoskeletal system is intact and unremarkable. There are moderately increased quantities of subcutaneous and intra-cavity adipose tissue.

TOXICOLOGY: The following specimens are submitted for possible toxicologic analysis: Blood, bile, urine and vitreous humor. A separate report will be issued.

SUMMARY OF CASE

This 53 year old male was executed by lethal injection on May 9, 2007 at 1:21 a.m. and was pronounced deceased at 1:38 a.m. His body was recovered from the execution chamber and an autopsy was ordered.

The body was held in a sealed body bag until an autopsy was performed on May 19, 1007 at 8:00 a.m. By agreement with the next-of-kin autopsy was limited to viewing and palpating the internal organs in-situ. Removal and dissection were only to be performed if abnormal observations required additional inquiry. None were necessary in this case.

There were no significant unusual findings at autopsy. Toxicology specimens were obtained and tested. Results are attached.

In my opinion, this person died as a result of an acute combined intoxication. The manner of death is homicide.

Signature _____ Date 6/29/07

Bruce P. Levy, M.D.
Chief Medical Examiner

BPL/lmr
T: 06/29/2007

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy Forensic Medical 850 RS Gass Blvd Nashville, TN 37216	**Laboratory ID:**	4343844
		Collected:	05/19/07 00:00
		Received:	05/22/07 13:04
		Completed:	10/02/07 08:42
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Heart Blood		

Workman, Phillip

Test(s) Ordered:
40599 - Profile-ME Comprehensive
41787 - Pancuronium (Pavulon)
42090 - Thiopental (Pentothal)
70521 - Confirmation Barbiturates

Drug Class	Result	Quantitation	Reporting Threshold
Pancuronium (Pavulon)	POSITIVE		
Pancuronium	**POSITIVE**	630 ng/mL	1 ng/mL
Thiopental (Pentothal)	POSITIVE		
Thiopental	**POSITIVE**	18900 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		50 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Barbiturates	**POSITIVE**		
Amobarbital	NONE DETECTED		50 ng/mL
Butabarbital	NONE DETECTED		50 ng/mL
Butalbital	NONE DETECTED		50 ng/mL
Pentobarbital	**POSITIVE**	615 ng/mL	50 ng/mL
Secobarbital	NONE DETECTED		50 ng/mL
Talbutal	NONE DETECTED		50 ng/mL
Sedatives/Hypnotics	NONE DETECTED		50 ng/mL
Methadone	NONE DETECTED		50 ng/mL
Benzodiazepines	NONE DETECTED		25 ng/mL
Cannabinoids (Marijuana)	NONE DETECTED		1 ng/mL
Cocaine Metabolite	NONE DETECTED		10 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343844
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 08:42
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Heart Blood		

Test(s) Ordered:

40599 - Profile-ME Comprehensive
41787 - Pancuronium (Pavulon)
42090 - Thiopental (Pentothal)
70521 - Confirmation Barbiturates

Drug Class	Result	Quantitation	Reporting Threshold
Opiates	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		50 ng/mL
Phenothiazines	NONE DETECTED		1 ng/mL
Salicylate	NONE DETECTED		
Salicylate	NONE DETECTED		5 mg/L
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343845
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 14:53
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
42090 - Thiopental (Pentothal)
41787 - Pancuronium (Pavulon)
70520 - Confirmation Barbiturates
71850 - Confirmation Phenobarbital

Drug Class	Result	Quantitation	Reporting Threshold
Pancuronium (Pavulon)	POSITIVE		
Pancuronium	POSITIVE	300 ng/mL	1 ng/mL
Thiopental (Pentothal)	CANCELED		
Thiopental	CANCELED		1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		100 ng/mL
Barbiturates	**POSITIVE**		
Butabarbital	NONE DETECTED		100 ng/mL
Butalbital	NONE DETECTED		100 ng/mL
Pentobarbital	**POSITIVE**	245 ng/mL	100 ng/mL
Secobarbital	NONE DETECTED		100 ng/mL
Talbutal	NONE DETECTED		100 ng/mL
Amobarbital	NONE DETECTED		100 ng/mL
Benzodiazepines	NONE DETECTED		100 ng/mL
Cannabinoids (Marijuana)	NONE DETECTED		5 ng/mL
Cocaine Metabolite	NONE DETECTED		50 ng/mL
Opiates	NONE DETECTED		50 ng/mL
Phencyclidine (PCP)	NONE DETECTED		10 ng/mL
Phenothiazines	NONE DETECTED		5 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
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Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343845
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 14:53
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
42090 - Thiopental (Pentothal)
41787 - Pancuronium (Pavulon)
70520 - Confirmation Barbiturates
71850 - Confirmation Phenobarbital

Drug Class	Result	Quantitation	Reporting Threshold
Stimulants	NONE DETECTED		50 ng/mL
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		100 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL
Salicylate	NONE DETECTED		1 mg/L
Sedatives/Hypnotics	NONE DETECTED		200 ng/mL

The sample quantity submitted is not sufficient to complete required testing.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E CURTIS MS
Date: OCT 02 2007

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy Forensic Medical 850 RS Gass Blvd Nashville, TN 37216	**Laboratory ID:**	4343846
		Collected:	05/19/07 00:00
		Received:	05/22/07 13:04
		Completed:	10/02/07 10:00
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Bile		

Test(s) Ordered: 42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Thiopental	POSITIVE	4470 ng/mL	1 ng/mL

The sample quantity submitted is not sufficient to complete required testing.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343847
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 11:38
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Vitreous		

Test(s) Ordered: 42197 - Vitreous Electrolyte Profile

Drug Class	Result	Quantitation	Reporting Threshold
Vitreous Electrolyte Profile	POSITIVE		
Glucose	NONE DETECTED		20 mg/dL
Blood Urea Nitrogen(BUN)	POSITIVE	26 mg/dL	1 mg/dL
Sodium(Na)	POSITIVE	116 mmol/L	1 mmol/L
Potassium(K)	POSITIVE	> 9 mmol/L	1 mmol/L
Chloride(Cl)	POSITIVE	115 mmol/L	1 mmol/L
Carbon Dioxide(CO2)	NONE DETECTED		1 mmol/L
Creatinine	POSITIVE	0.8 mg/dL	0.1 mg/dL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

----- END OF REPORT -----

Plaintiff's Exhibit 28

to

Complaint for Declaratory Judgment and Injunctive Relief

Dr. David Lubarsky
2007 Affidavit

AFFIDAVIT OF DAVID A. LUBARSKY, M.D., M.B.A.

Comes now the affiant, David A. Lubarsky, M.D., M.B.A., and declares under the penalty of perjury all as follows:

1. My name is David A. Lubarsky. I live in Miami, Florida.

2. I graduated from Washington University with a B.S. in 1980 and an M.D. in 1984. I also hold an M.B.A. from Duke University (1999).

3. I am licensed to practice medicine in New York (1985), North Carolina (1988) and Florida (2002). I moved from North Carolina to Florida, and while applying for a full license, in 2001, and early 2002, held a Florida Board of Medicine Medical Faculty Certificate.

4. I am board certified by the National Board of Medical Examiners, the American Board of Anesthesiology (placing in the 99th percentile on Part I of its examination), and have completed the American Board of Anesthesiology Maintenance of Certification Exam (2004) and am certified by the American Academy of Pain Management.

5. I serve as the Emanuel M. Papper Professor and Chairman, Department of Anesthesiology, University of Miami School of Medicine, with a secondary academic appointment as Professor, Department of Management, University of Miami School of Business.

6. I have published, as author and co-author, 127 books, chapters, monographs, journal articles, and other publications or abstracts, primarily in the area of anesthesiology. I have also made video presentations and other private-sector publications, contributed to conference proceedings and newsletters and created electronic World Wide Web, and/or Internet publications related to my work.

7. I have lectured, appeared on panels, and served as a visiting professor throughout the United States and in Paris, Hong Kong and Japan.

8. I have been retained as an expert witness in approximately 30 malpractice cases and given about 10 depositions.

9. My credentials are set forth in greater detail in the curriculum vitae, a true and correct copy of which is attached hereto, incorporated herein, and marked as Lubarsky Exhibit 1.

10. Together with Leonidas Koniaris, M.D., Teresa A. Zimmers, Ph.D.,and Jonathan P. Sheldon, J.D., I conducted the research and reported the findings contained in "Inadequate anesthesia in lethal injection for execution" in THE LANCET, volume 365, pages 1412-14, published on April 16, 2005, a true and correct copy of which is attached hereto, incorporated herein, and marked as Lubarsky Exhibit 2.

11. THE LANCET is one of the most prestigious medical journals in the world. All publications go through a rigorous process of review for both pertinence and scientific method. Usually at least two reviewers eminent in the field being investigated provide input to an editor in charge of the section in which the paper will be published. Among the methods evaluated are how data were collected, and statistical analysis of that data. Furthermore, conclusions are carefully monitored for faithfulness to the data described in the paper.

12. Our research dealt with the process of injecting a person sentenced to death with a succession of three chemicals: thiopental (also known as sodium pentothal), pancuronium bromide, and potassium chloride, and raised the question whether the levels of thiopental in the bloodstream of the person being executed were high enough to produce unconsciousness throughout the execution and whether the protocols provided by Texas and Virginia would absolutely produce a foolproof method of humane execution.

13. Each of the propositions of fact set forth in the LANCET article as aforesaid reflects my opinion to a reasonable degree of scientific certainty.

14. Based on our research, the article concludes that toxicology reports from the four lethal injection jurisdictions which provided them showed that postmortem concentrations of thiopental (sodium pentothal) in the blood of persons who had been executed were lower than that required for surgery in 43 of

49 cases reported (88%), and 21 (43%) inmates had concentrations consistent with awareness. This conclusion reflects my opinion to a reasonable degree of scientific certainty.

15. In light of my research and conclusions from the LANCET article, I have reviewed the protocol for execution of a death sentence in Tennessee, including interrogatory answers and deposition excerpts of Warden Ricky Bell, a memorandum opinion in the case of *Abdur'Rahman v. Sundquist*, the Tennessee Supreme Court opinion in *Abdur'Rahman v. Bredesen*, a physician's order for James L. Jones, and the autopsy of Robert Coe.

16. According to the response of Warden Ricky Bell to interrogatories in the case of *Abu-Ali Abdur'Rahman v. Sundquist*, it appears that three different drugs are employed: 5 grams of sodium pentothal, also known as thiopental; 10 mg pancuronium bromide (10 10cc vials containing 1 mg pancuronium bromide); and 100cc injectable solution of potassium chloride.

17. As an initial matter, the description of the drugs involved highlights the type of confusion and error in the mixing and administration of drugs which can lead to inadequate anesthesia. For instance, the Warden's response indicates that 5 grams (5000 milligrams) of sodium pentothal, also known as thiopental, is administered in a 50cc, or 50 ml, solution. The concentration of the thiopental, therefore, is 100 mg/ml. Thiopental, however, is never mixed in that fashion, and

the physician's order is for 5 grams in a 25 mg/ml solution (which is the standard mixing concentration). It is not clear that thiopental can be reliably mixed at 100mg/ml.

18. Thiopental, is an ultra-short acting substance which produces shallow anesthesia. Pancuronium bromide is not an anesthetic. It is a paralytic agent, which stops breathing. It has two contradictory effects: first, it causes the person to whom it is applied to suffer suffocation when the lungs stop moving; second, it prevents the person from manifesting this suffering, or any other sensation, by facial expression, hand movement, or speech. The third chemical, potassium chloride, burns intensely as it courses through the veins toward the heart. It also causes massive muscle cramping.

19. Thus, adequate anesthesia is necessary to mitigate the suffering of the condemned. If adequate anesthesia has not been administered, or does not get to the patient, or wears off during the procedure, the condemned will feel the pain caused by the suffocation and administration of the potassium chloride. However, the condemned will be unable to communicate his pain because the pancuronium bromide has paralyzed his face, his arms, and his entire body so that he cannot express himself either verbally or otherwise.

20. The Coe autopsy shows the level of thiopental to be 10200ng/ml, which is .0102 mg/ml, which is 10.2 mg/L. This means that assuming post mortem

thiopental levels reflect those at death, which, according to an extensive review of the medical literature they do, Mr. Coe was probably awake, suffocating in silence, and felt the searing pain of injection of intravenous potassium chloride. The drug level in Mr. Coe is entirely consistent with a thiopental underdose if the warden had administered a single 50cc syringe with the concentration ordered by the physician - i.e. ¼ of the intended dose, and one which would clearly be insufficient to last through the execution process.

21. With a reasonable degree of medical certainty, the post mortem drug levels of thiopental measured in Mr. Coe would not be sufficient to produce unconsciousness or anesthesia.

22. Drugs that are sequestered in the body tissues as thiopental is undergo a post mortem redistribution that is slight and likely to increase blood levels compared to actual levels at death. This means that the post mortem levels are actually higher than those at death, meaning that the inadequate levels of anesthesia predicted by Mr. Coe's autopsy were even more inadequate at the time of death.

23. While the correctional officials might deem the injection of medications as proof of anesthesia, this is a false notion. It is only by continuously measuring effect that one can conclude that anesthesia is present. That is the reason that animal euthanasia protocols prohibit the use of pancuronium as it

masks the awakening of the animal. That is the reason continuous presence of a highly trained individual is necessary during surgery. Merely pushing a syringe into an intravenous line is no guarantee that the drug will reach the intended recipient, nor that the recipient will experience the desired effect.

24. I conclude, given the Tennessee protocol, and to a reasonable degree of scientific certainty, that a person subjected to the protocol would very possibly not be adequately anesthetized and would have a reasonably high chance of suffering a cruel and inhumane death, for the reasons set forth in "Inadequate anesthesia in lethal injection for execution" in THE LANCET, as aforesaid.

Further, the affiant saith naught.

I declare under penalty of perjury that the foregoing is true and correct.

David A. Lubarsky, M.D., M.B.A.
Emanuel M. Papper Professor and Chair
Department of Anesthesiology,
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University of Miami Miller School of Medicine
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Exhibit 1 to Dr. David Lubarsky 2007 Affidavit

UNIVERSITY OF MIAMI
CURRICULUM VITAE

Date: April 2006

PERSONAL

Name: David Alan Lubarsky, M.D., M.B.A.

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Date of birth: August 2, 1959
Place of birth: New York, NY

Present academic rank and title:

Primary academic appointment: **Emanuel M. Papper Professor and Chairman**
Department of Anesthesiology
Professor of Anesthesiology, with tenure
University of Miami School of Medicine

Secondary academic appointment: **Professor**
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Citizenship: U.S.A.

HIGHER EDUCATION

Washington University, St. Louis, MO, May, 1980, B.A.
Washington University School of Medicine, St. Louis, MO, May, 1984, M.D.
Fuqua School of Business, Duke University, Durham, NC, August, 1999, M.B.A.

Medical licensure: November, 2002 - Florida State License #ME86449
December, 2001-Florida Board of Medicine
Medical Faculty Certificate-Number: 1457
July, 1988-North Carolina State License #32774
July, 1985-New York State License #162663-1

Certification: National Board of Medical Examiners-July, 1985
Part I American Board of Anesthesiology (99th%) -July, 1987
Part II Board Certification-October, 1988
Recertified American Board of Anesthesiology - July 2004
American Academy of Pain Management-1991

Previous Academic Appointments

Professor (with tenure) and Vice-Chairman,
Chief Division of General, Vascular and Transplant Anesthesia and Surgical Intensive Care
Department of Anesthesiology,
Duke University Medical Center
July 1988 - November 2001

Adjunct Professor, Fuqua School of Business, Duke University 6/2000-6/2002

Academic training:

Weekend Executive Masters in Business Administration (WEMBA) Program
The Fuqua School of Business
Duke University
January 1998 - August 1999
Honored as Fuqua Scholar (top of class)

Fellowship in Transesophageal Echocardiography
Duke University Medical Center
Fiona M. Clements, M.D., Chief, Division of Cardiac Anesthesiology
Joseph A. Kisslo, M.D., Director, Echocardiography Lab
October 1992-December 1992

Fellowship in Cardiac and Vascular Anesthesia and Clinical Research
New York University Medical Center
Stephen Thomas, M.D., Division Head
July 1987-June 1988

Residency
Department of Anesthesiology
New York University Medical Center
Herman Turndorf, M.D., Professor and Chairman
July 1985-June 1987

Internship
Department of Medicine
Westchester County Medical Center
Richard Levere, M.D., Chairman
July 1984-June 1985

Publications

Books published:

1. Robertson KM, **Lubarsky DA**, Ranasinghe S: Anesthesiology Pearls of Wisdom 2nd edition. New York, NY: McGraw Hill, 2005. p. 1 - 431.

2. Thiemann LJ, Robertson KM, **Lubarsky DA**, Ranasinghe S: Pearls of Wisdom Nurse Anesthetist Exam Review. New York, NY: McGraw Hill, 2005. p. 1- 425.

3. Gallagher C, Martinez-Ruiz R, **Lubarsky DA**: Procedures in Anesthesia. McGraw Hill Publishing. (In press 2006)

4. Robertson KM, **Lubarsky DA**: Preparing for the Written Boards: Pearls of Wisdom. Boston Medical Publishing, June 2001.

5. Gallagher CJ, Hill SE, **Lubarsky DA**: Board Stiff Too: Preparing for the Anesthesia Orals. Boston, Butterworth-Heinemann, 2000.

6. **Lubarsky DA**: The Answer Key to the Written Boards. Durham, NC, A+ Homeprep, 1992, 2nd edition 1993, 3rd edition 1994, 4th edition 1995.

7. Gallagher CJ, **Lubarsky DA**: Preparing for the Anesthesia Orals: Board Stiff. Boston, Butterworths, 1990.

Book chapters and monographs published:

1. Ellis J, Roizen M, Mantha S, Schwartze G, McKinsey J, **Lubarsky D**, Kenaan C: Anesthesia for Vascular Surgery. Clinical Anesthesia 5th Edition, Lippincott Williams & Wilkins Publishing, June 24, 2005, Chapter 32:933 - 73.

2. **Lubarsky DA** and Locke J, Ambulatory Anesthesia Billing, Ambulatory Anesthesia & Perioperative Analgesia Manual, McGraw-Hill Companies, 2005, Chapter 12:115 - 122.

3. J.G Reves, Peter S.A. Glass, **David A. Lubarsky**, Matthew D. McEvoy: Intravenous Nonopioid Anesthestics. Miller's Anesthesia 6th Edition, Elsevier Publishing, 2004 chapter 10.

4. Gayer S and **Lubarsky DA**: Cost-effective Anti-emesis. In International Anesthesiology Clinics: Post-operative nausea and Vomiting 2003 Vol 41(4):145-164.

5. Knudsen NW, Sebastian MW, **Lubarsky DA**: Cost containment in vascular surgery. Seminars in Cardiothoracic and Vascular Anesthesia 2000 (November) Vol 4(4):256-264.

6. Rock P, **Lubarsky DA**: The business of perioperative medicine. Anesthesiology Clinics of North America 18(3):677-698, 2000.

7. Reves JG, Glass PSA, **Lubarsky DA**: Nonbarbiturate intravenous anesthetics, Anesthesia, fifth edition. Edited by Miller RD. New York, Churchill Livingstone, pp 228-272, 2000.

8. Dear GdeL, Panten RR, **Lubarsky DA**: Operating room information systems, Seminars in Anesthesia, Perioperative Medicine and Pain. Edited by Katz RL and Ward DS. Vol 18, No 4 (December), pp 322-333, 1999.

9. **Lubarsky DA**: How to write clinical guidelines for value-based anesthesia care,

Anesthesia Practice Management: How to Assess and Promote Value. Monograph of the Ad Hoc Committee on Value-Based Anesthesia Care. Copyright American Society of Anesthesiologists, 1999.

10. Tardiff BE, Jollis JG, **Lubarsky DA**: Use of information systems and large databases in cardiovascular medicine, Outcome Measurements in Cardiovascular Medicine. Edited by Tuman KJ. Lippincott Williams & Wilkins, pp 67-80, 1999.

11. Lineberger CK, **Lubarsky DA**: Anesthesia for carotid endarterectomy. Curr Opin Anaesthesiol 11:479-484, 1998.

12. Panten RR, Dear GdeL, **Lubarsky DA**: Pharmacoeconomics and practice guidelines: Moving toward value-based care, Problems in Anesthesia, Vol. 10, No. 3. Edited by Arens JF, Prough DS. Baltimore, Williams & Wilkins, pp 285-291, 1998.

13. Inge WW, Grichnik KP, Lineberger CK, **Lubarsky DA**: Vascular surgery in the geriatric patient, Geriatric Anesthesiology. Edited by McLeskey CH. Baltimore, Williams & Wilkins, pp 637-644, 1997.

14. **Lubarsky DA**, Moskop RJ: The "niche" of etomidate in current anesthetic practice, Progress in Anesthesia. Edited by Eisenkraft JB. Philadelphia, WB Saunders, pp 155-168, 1994.

15. Reves JG, Glass PSA, **Lubarsky DA**: Nonbarbiturate intravenous anesthetics, Anesthesia, Fourth edition. Edited by Miller RD. New York, Churchill Livingstone, pp 247-289, 1994.

16. Gallagher C, Sladen RN, **Lubarsky DA**: Thoracotomy: postoperative complications, Problems in Anesthesia: Thoracic Anesthesia, Vol. 4, No. 2, June 1990. Edited by Brodsky JB. Philadelphia, JP Lippincott, pp 393-415, 1990.

17. **Lubarsky DA**, Rodman R: Carotid endarterectomy: General versus regional anesthesia, Problems in Anesthesia: Cardiovascular Anesthesia, Vol. 1, No. 3, July-September 1987. Edited by Thomas SJ. Philadelphia, JP Lippincott, pp 496-510, 1987.

Journals:

1. Abouleish AE, Prough AD, **Lubarsky DA**: Unintended Consequences? Unanswered Questions? Anesth Analg, 2006;102: xxx-xxx (In publication)

2. Vigoda MM, **Lubarsky DA**: Failure to Recognize Loss of Incoming Data into an Anesthesia Record Keeping System Increased Medical Liability. Anesth Analg, 2006 (In publication)

3. Dexter F, **Lubarsky DA**: Evidence-based Management Assessment of Return on Investment from Anesthesia Information Management Systems. AANA Journal, June 2006 (in publication)

4. Koniaris LG, Zimmers TA, **Lubarsky DA**, Sheldon JP; Evidence of Inadequate Anesthesia in Lethal Injection for Execution. The Lancet 2005, vol. 365; 9428:1412-1414.

5. **Lubarsky D**, Reves JG; Effect of Subspecialty Organization of an Academic Department of Anesthesiology on Faculty Perceptions of the Workplace. Jamcollsurg 2005, vol. 201; 3:434-437.

6. Candiotti K, Kamat A, Barach P, Nhuch F, **Lubarsky D**, Birnbach D; Emergency Preparedness for Biological and Chemical Incidents - A Survey of Anesthesiology Residency Programs in the United States. Anesth Analg 2005 101:1135-1140.

7. Olson RP, Stone A, **Lubarsky D**; Prevalence and Significance of Low Preoperative Hemoglobin in ASA 1 or 2 Outpatient Surgery Candidates. Anesth Analg 2005, 101:1337-1340.

8. Candiotti KA, Birnbach DJ, **Lubarsky DA**, Nhuch F, Kamat A, Koch WH, Nikoloff M, Wu L, Andrews D; The Impact of Pharmacogenomics on Postoperative Nausea and Vomiting. Anesthesiology 2005 102;543-549.

9. Wachtel RE, Dexter F, **Lubarsky D**: Financial Implications of a Hospital's Specialization in Rare Physiologically Complex Surgical Procedures. Anesthesiology 2005 103(1); 161-167.

10. **Lubarsky D**: Incentivize Everything, Incentivize Nothing. Anesth Analg 2005;100:490-2.

11. Macario A, Dexter F, **Lubarsky D**: Meta- Analysis of Trials Comparing Postoperative Recovery After Anesthesia with Sevoflurane or Desflurane. Am J Health-Syst Pharm 62:63-68, 2005.

12. Dexter F., **Lubarsky, D**: Using Length of Stay Data from a Hospital to Evaluate Whether Limiting Elective Surgery at the Hospital is an Inappropriate Decision. J Clin Anesth 2004 16:421-425.

13. Dexter F, Abouleish A, Whitten C, **Lubarsky D**, Epstein R: Impact of Reducing Turnover times on Staffing Costs. Anesth Analg 2004 98:872.

14. Gan TJ, **Lubarsky DA**, Flood EM, Thanh T, Masukopf J, Mayne T, Chen C: Patient preferences for acute pain treatment. Br. J. Anaesth 2004 92:681-688.

15. Olson, Ronald P., Schow, Adam J., McCann, Richard, **Lubarsky, David A.**, Gan, Tong J: Absence of adverse outcomes in hyperkalemic patients undergoing vascular access surgery: [Absence de complications chez des patients hyperkaliemiques devant subir une intervention chirurgicale d'acces vasculaire]. Can J Anesth 2003 50:553-557.

16. Abouleish AE, Epstein RH, **Lubarsky DA**, Dexter F: Use of operating room information system data to predict the impact of reducing turnover times on staffing costs. Anesth Analg 2003 97:1119 - 1126.

17. Gan TJ, Ing RJ, Dear G, Wright D, El-Moalem HE, **Lubarsky DA**: How much are patients willing to pay to avoid intraoperative awareness? J Clin Anesth 15:108 - 112, 2003

18. Dexter F, Macario A, Traub RD, **Lubarsky DA**: Operating room utilization alone is not an accurate metric for the allocation of operating room block time to individual surgeons

with low caseloads. Anesthesiology, May 2003 98:5.

19. Abouleish AE, Dexter F, Epstein RH, **Lubarsky DA**, Whitten CW, Prough DS: Labor costs incurred by anesthesiology groups due to operating rooms not being allocated and cases not being scheduled to maximize operating room efficiency. Anesth Analg 2003:96:1109 - 1113.

20. Schow AJ, **Lubarsky DA**, Gan TJ: Can succinylcholine be safely used in hyperkalemic patients? Anesth Analg 2002 95:119-122.

21. Dexter F, Blake JT, Penning DH, **Lubarsky DA**: Calculating a potential increase in hospital margin for elective surgery by changing operating room time allocations or increasing nursing staffing to permit completion of more cases. Anesth Analg 2002 94:138-142

22. Dexter F, **Lubarsky DA**, Blake JT: Sampling error can significantly affect measured hospital financial performance of surgeons and resulting operating room time allocations. Anes Analg 95:184-188, 2002.

23. Dexter F, Blake JT, Penning DH, Sloan B, Chung P, **Lubarsky DA**: Use of linear programming to estimate impact of changes in a hospital's operating room time allocation on perioperative variable costs. Anesthesiology 2002; 96:718-724.

24. Dexter F, Gan TJ, Naguib M, **Lubarsky DA**: Cost identification analysis for succinylcholine. Anesth Analg 92:693-699, 2001.

25. Dexter F, Macario A, **Lubarsky DA**: The impact on revenue of increasing patient volume at surgical suites with relatively high operating room utilization. Anesth Analg 92:1215-1221, 2001.

26. Gan TJ, Sloan F, Dear G, El-Moalem H, **Lubarsky DA**: How much are patients willing to pay for avoidance of postoperative nausea and vomiting? Anesth Analg 92:393-400, 2001.

27. Bell ED, Penning DH, Cousineau EF, White WD, Hartle AJ, Gilbert WC, **Lubarsky DA**: How much labor is in a labor epidural? Manpower cost and reimbursement for an obstetric analgesia service in a teaching institution. Anesthesiology 92:851-8, 2000.

28. Hill RP, **Lubarsky DA**, Phillips-Bute B, Fortney JT, Creed MR, Glass PSA, Gan TJ: Cost-effectiveness of prophylactic antiemetic therapy with ondansetron, droperidol, or placebo. Anesthesiology 92:958-67, 2000.

29. **Lubarsky DA**, Fisher SD, Slaughter TF, Green CL, Lineberger CK, Astles JR, Greenberg CS, Inge III WW, Krucoff MW: Myocardial ischemia correlates with reduced fibrinolytic activity following peripheral vascular surgery. J Clin Anesth 12:136-41, 2000.

30. **Lubarsky DA**, Reves JG: Using Medicare multiples results in disproportionate reimbursement for anesthesiologists compared to other physicians. J Clin Anesth 12:238-241, 2000.

31. Dexter F, Macario A, Manberg PJ, **Lubarsky DA**: Computer simulation to determine

how rapid anesthetic recovery protocols to decrease the time for emergence or increase the phase 1 postanesthesia care unit bypass rate affect staffing of an ambulatory surgery center. Anesth Analg 88:1053-1063, 1999.

32. Dexter F, Macario A, **Lubarsky DA**, Burns DD: Statistical method to evaluate management strategies to decrease variability in operating room utilization: Application of linear statistical modeling and Monte-Carlo simulation to operating room management. Anesthesiology 91:262-274, 1999.

33. Dexter F, Macario A, Traub RD, Hopwood M, **Lubarsky DA**: An operating room scheduling strategy to maximize the use of operating room block time: computer simulation of patient scheduling and survey of patients' preferences for surgical waiting time. Anesth Analg 89:7-20, 1999.

34. Zhou J, Dexter F, Macario A, **Lubarsky DA**: Relying solely on historical surgical times to estimate accurately future surgical times is unlikely to reduce the average length of time cases finish late. J Clin Anesth 11:601-605, 1999.

35. Dexter F, **Lubarsky DA**, Gilbert BC, Thompson C: A method to compare costs of drugs and supplies among anesthesia providers: A simple statistical method to reduce variations in cost due to variations in case mix. Anesthesiology 88:1350-1356, 1998.

36. Dexter F, Penning DH, **Lubarsky DA**, DeLong E, Sanderson I, Gilbert BC, Bell E, Reves JG: Use of an automated anesthesia information system to determine reference limits for vital signs during cesarean section under general or spinal anesthesia: Application to medical malpractice claims. J Clin Monit Comput 14:491-498, 1998.

37. Lineberger CK, **Lubarsky DA**: Con: General anesthesia and regional anesthesia are equally acceptable choices for carotid endarterectomy. J Cardiothorac Vasc Anesth 12:115-117, 1998.

38. Pisetsky MA, **Lubarsky DA**, Capehart BP, Lineberger C, Reves JG: Valuing the work performed by anesthesiology residents and the financial impact on teaching hospitals of a reduced anesthesia residency program size. Anesth Analg 87:245-254, 1998 [published erratum appears in Anesth Analg 1998 Nov;87(5):1031].

39. Coleman RL, Sanderson IC, **Lubarsky DA**: Anesthesia information management systems as a cost containment tool. CRNA 8(2): 77-83, 1997.

40. **Lubarsky DA**, Glass PSA, Ginsberg B, Dear G de L, Dentz ME, Gan TJ, Sanderson IC, Mythen MG, Dufore S, Pressley CC, Gilbert WC, White WD, Alexander ML, Coleman RL, Rogers MC, Reves JG: The successful implementation of pharmaceutical practice guidelines: Analysis of associated outcomes and cost savings. Anesthesiology 86:1145-1160, 1997.

41. **Lubarsky DA**, Sanderson IC, Gilbert WC, King KP, Ginsberg B, Dear G de L, Coleman RL, Pafford TD, Reves JG: Using an anesthesia information management system as a cost containment tool: Description and validation. Anesthesiology 86:1161-1169, 1997.

42. Astles JR, **Lubarsky DA**, Loun B, Sedor FA, Toffaletti JG: Pneumatic transport exacerbates interference of room air contamination in blood gas samples. Arch Path Lab

Med 120(7):642-647, 1996.

43. **Lubarsky DA**: Fast track in the post-anesthesia care unit: Unlimited possibilities? J Clin Anes 8:70S-72S, 1996.

44. Dentz ME, **Lubarsky DA**, Smith LR, McCann RL, Moskop RJ, Inge W, Grichnik KP: A comparison of amrinone with sodium nitroprusside for control of hemodynamics during infrarenal abdominal aortic surgery. J Cardiothorac Vasc Anesth 9:486-490, 1995.

45. Hadzija BW, **Lubarsky DA**: Compatibility of etomidate, sodium thiopental and propofol injections with other drugs commonly administered during induction of anesthesia. Am J Health-Syst Pharm 52:997-999, 1995.

46. **Lubarsky DA**, Smith LR, Sladen RN, Mault JR, Reed RL: Defining the relationship of oxygen delivery and consumption: Use of biologic system models. J Surg Res 58:503-508, 1995.

47. **Lubarsky DA**: Understanding cost analyses: Part 1, A practitioner's guide to cost behavior. J Clin Anesth 7:519-521, 1995.

48. Astles R, **Lubarsky DA**, Loun B, Sedor F, Toffaletti J: Pneumatic tube system exacerbates the effect of room air contamination. Clin Chem 41:155, 1995.

49. **Lubarsky DA**, Hahn C, Bennett DH, Smith LR, Bredehoeft SJ, Klein HG, Reves JG: The hospital cost (fiscal year 1991/1992) of a simple perioperative allogeneic red blood cell transfusion during elective surgery at Duke University. Anesth Analg 79:629-637, 1994.

50. Moskop RJ, **Lubarsky DA**: Carbon dioxide embolism during a laparoscopic cholecystectomy. South Med J 87:414-415, 1994.

51. Grichnik KP, Dentz M, **Lubarsky DA**: Hemodynamic collapse during thoracoscopy. J Cardiothorac Vasc Anesth 7:588-589, 1993.

52. Dentz ME, **Lubarsky DA**: Leontiasis ossea: an unusual presentation of a difficult airway. Anesth Analg 76:678-679, 1993.

53. **Lubarsky DA**, Griebel JA, Camporesi EC, Piantadosi CA: Comparison of systemic oxygen delivery and uptake with NIR spectroscopy of brain during normovolemic hemodilution in the rabbit. Resuscitation 23:45-57, 1992.

54. **Lubarsky DA**, Gallagher C, Berend JL: Secondary polycythemia does not increase the risk of perioperative hemorrhagic or thrombotic complications. J Clin Anes 3:99-103, 1991.

55. **Lubarsky DA**, Kaufman B, Turndorf H: Anesthesia unmasking benign Wolff-Parkinson-White-Syndrome. Anesth Analg 68:172-4, 1989.

56. Kronenfeld MA, **Lubarsky DA**, Feiler M, Galloway A, Thomas SJ: The effect of ventilation on aortic blood gases during left ventricular ejection before separation from cardiopulmonary bypass. J Cardiothorac Anes 3:301-304, 1989.

57. **Lubarsky DA**, Kaufman B, Turndorf H: Anesthetic care of a patient with an intracranial hemorrhage after thrombolytic therapy. J Clin Anes 2:276-279, 1989.

Other works, publications, and abstracts:

1. Koniaris L, Zimmers T, **Lubarsky D**: Lethal Injection Redux. Playboy September 2005, P54, Forum: reader Response.

2. M. Vigoda, **D. Lubarsky**: Timeliness of Documentation - Medical Legal Ramifications. (Abstract Presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A1256.

3. M. Vigoda, **D. Lubarsky**: Failure to Recognize Loss of Incoming Data While Using an Automated Anesthesia Record Keeping System Increased medical Liability Exposure. (Abstract Presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A1204.

4. M. Vigoda, **D. Lubarsky**: Unanticipated Drawbacks of Easy Access to the electronic Medical Record - Balancing Security and Availability While Preventing Unauthorized Access Attempts. (Abstract Presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A1268.

5. M. Vigoda, J. Jacque, **D. Lubarsky**, F. Dexter: Increasing QA Completion Rate is Associated with Increased Rate of Documented QA Complications. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A798.

6. M. Vigoda, **D. Lubarsky**, E. Varga, S. Lin: Anesthesia Information System Demonstrates Use of Intraoperative Beta Blockers in Patients "at risk" for CAD Undergoing Non-Cardiac Surgery. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005; 103:A1278.

7. Candiotti K, Curia L, Rodriguez Y, Birnbach D, **Lubarsky D**: CYP2D6 Frequencies in the South Florida Population as Determined by the Amplichip®CYP450 Assay. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005; 103:A788

8. Candiotti K, Saltzman B, Curia L, Rodriguez Y, **Lubarsky D**: A Comparison of Different Types of HAZMAT Respirators by Anesthesiologists. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005; 103:A1194.

9. K. Candiotti, A. Kamat, F. Nhuch, **D. Lubarsky**, D. Birnbach: Treating PONV Ondansetron Prophylaxis Failures: A Comparison of Redosing with Ondansetron vs. Granisetron. (Abstract presentation at the IARS 79th Clinical and Scientific Congress in Honolulu, Hawaii, March 11 - 15, 2005).

10. **Lubarsky D**: Financial Implications of a Hospital's Specialization in Rare Phsysiologically Complex Surgical Procedures. (Poster presentation at the ASA Annual

Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1409.

11. Estacio R, **Lubarsky D**, Barach P: Cardiac Arrest and Death during Anesthesia Secondary to Iatrogenic Hyperkalemia: Case Report and Database Review. (Poster presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1287.

12. Vigoda M, Gencorelli F, Lin S, **Lubarsky D**, Birnbach D: Anesthesia Information System Helps Identify Missed Opportunities for Perioperative Beta Blockade. (Abstract presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1378.

13. Vigoda M, Gencorelli F, Lin S, Birnbach D, **Lubarsky D**: Anesthesia Information System Demonstrates inadequacy of Perioperative Beta Blocker Therapy. (Abstract presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1381.

14. Candiotti K, Nhuch F, Kamat A, **Lubarsky D**, Birnbach D: Pharmacogenomics Affects Postoperative Nausea and Vomiting: The Effects of CYP2D6 Allele Frequency on Ondansetron Prophylaxis Failure. (Abstract presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1611.

15. Macario A., **Lubarsky D**: The Impact of Desflurane and Sevoflurane on the Risk of Postoperative nausea and vomiting: a systematic review of the published literature. (Abstract presentation at the IARS 78th Clinical and Scientific Congress, Tampa, Florida, March 2004).

16. Donnelly AJ, Macario A, **Lubarsky DA**: Pharmacoeconomics of Inhaled Anesthetics. (Special Report Activity, ICPME accredited, McMahon Publishing Group, February 2004.

17. Candiotti KA, **Lubarsky DA**, Kamat A, Restler C: Implementation of Granisetron 0.1mg for Prophylaxis of P.O.N.V. (Poster Presentation at the American Society of Healthcare Pharmacists meeting in New Orleans, December 8-10, 2003).

18. Breslin D, **Lubarsky D**, Hopkins M, Gan TJ: Delayed Discharge from the Post Anesthetic Care Unit. An Ongoing Improvement Process. (Abstract presentation at the ASA Annual Meeting, San Francisco, California, October 2003) Anesthesiology 2003; 99:A1136.

19. Epstein RH, Dexter F, Abouleish AE, Whitten CW, **Lubarsky DA**: Cost Savings from Reducing Turnover Time Result From Reductions in Surgical OR Allocations, Not Less Overtime. (Abstract presentation at the ASA Annual Meeting, San Francisco, California, October 2003) Anesthesiology 2003; 99:A1346.

20.

21. Dexter F, **Lubarsky DA**, Uncertainty in the Operating Rooms in Which Cases are Performed Has Little Effect on Operating Room Allocations and Efficiency (Award Winning Abstract Presentation at the AACD 15th Annual Meeting, Orlando, Florida, October 13, 2002).

22.

23. Dexter F, **Lubarsky DA**, Anesthesia Groups with Exclusive Contracts can Quantify the Cost of Operating Rooms Not Being Allocated and Cases Not Being Scheduled to Maximize Operating Room Efficiency (Award Winning Abstract Presentation at the AACD 15th Annual Meeting, Orlando, Florida, October 13, 2002).

24. Gan TJ, **Lubarsky DA**, Main causes of delay in-patient discharge from PACU in a major teaching hospital. (Abstract Presentation at ASA Annual Meeting, Orlando, FL, October 2002) Anesthesiology 2002;96:A1136.

25. **Lubarsky DA**, Reves J. Straightening out RVU Formulas (letter). ASA Newsletter. June 2002.

26. Schow AJ, **Lubarsky DA**, Gan TJ: Can succinylcholine be safely used in hyperkalemic patients? (Abstract Presentation at the 2001 ASA Annual Meeting) Anesthesiology 2001;95:A1009.

27. Olson RP, Schow AJ, Gan TJ, **Lubarsky DA**. Vascular Access Surgery in Hyperkalemic Patients. (Abstract Presentation at the 2001 ASA Annual Meeting) Anesthesiology 2001;95:A1195.

28. Gan T, Dear G, Wright MD, El-Moalem H, Sigl J, **Lubarsky DA**. Patient Willingness to pay for avoidance of anesthesia related postoperative outcomes. (Poster Presentation at the IARS 75th Clinical and Scientific Congress, March 16-20, 2001).

29. Wright D, **Lubarsky DA**, Dear G, Sigl J, Reeves J, Gan T. Willingness to pay to avoid intra-operative awareness. (Poster Presentation at the IARS 75th Clinical and Scientific Congress, March 16-20, 2001).

30. Gan TJ, **Lubarsky DA**: Cost effectiveness ratio: an often misunderstood term (letter). Anesth Analg 88(5):1191-2, 1999

31. Petros KO, Knudsen NK, Sebastian MW, **Lubarsky DA**. Impact of education and practice guidelines for propofol use in the surgical intensive care unit. (Poster Presentation at ACCP/ESCP 1st International Congress on Clinical Pharmacy, Orlando, FL, April 1999) Pharmacotherapy 19(4):P350, 1999.

32. **Lubarsky DA**, DeLong ER: The impact of choice of muscle relaxant on postoperative recovery time. Anesth Analg 87:499-500, 1998.

33. Dear G, **Lubarsky DA**, Gilbert W, J Reves: Compliance with HCFA terminology; an automated system for audit of anesthesia documentation. Anesth Analg 86:S27, 1998.

34. Dear GdeL, King KP, Gilbert WC, **Lubarsky DA**: Is it possible to maintain drug cost savings: a two year follow-up report. Anesthesiology 89:A1352, 1998.

35. DeLong ER, Kwatra MM, Gan TJ, Glass PSA, Sanderson IC, Gilbert WC, Coleman RL, **Lubarsky DA**, Reves JG: A large population study reveals reduced anesthetic requirements in females. Anesthesiology 89:A126, 1998.

36. DeLong ER, Kwatra MM, Gan TJ, Glass PSA, Sanderson IC, Gilbert WC, Coleman RL, **Lubarsky DA**, Reves JG: Aging profoundly decreases anesthetic requirement.

Anesthesiology 89:A825, 1998.

37. Gan TJ, **Lubarsky DA**, Sloan F, Dear R, Dear G: How much are patients willing to pay for a completely effective antiemetic? Anesthesiology 89:A7, 1998.

38. Sibert K, D'Ercole F, Gilbert W, Smith F, **Lubarsky DA**: Causes of OR delays: differing perceptions of anesthesiologists and OR nurses. Anesth Analg 84:S54, 1997.

39. **Lubarsky DA**: Understanding the term "cost-effectiveness." J Clin Anes 9:603-604, 1997.

40. **Lubarsky DA**: HMO contracts should cover variable costs too. American Medical News, November 10, Volume 40, Number 42, p. 22, 1997.

41. **Lubarsky DA**: Response to: Bailey PL, Egan TD: The successful implementation of pharmaceutical practice guidelines? Far from convincing! Anesthesiology 87:1583-1584, 1997.

42. **Lubarsky DA**: Response to: Riley ET: Economic analysis of anesthetic drug use. Anesthesiology 87:1585-1586, 1997.

43. **Lubarsky DA**: Response to: Viby-Mogensen J: Implementation of pharmaceutical practice guidelines. Anesthesiology 87:1587, 1997.

44. **Lubarsky DA**: Sustaining cost savings through distribution control and individualized feedback. Anesthesiology 85:A969, 1996.

45. **Lubarsky DA**, Gilbert W, Alexander ML, Sanderson I: Validation of the programming of an anesthesia information management system for cost calculations. Anesthesiology 85:A1046, 1996.

46. Slaughter TF, Gittleson S, Lineberger C, Inge W, Wildermann N, Green C, Greenberg CS, **Lubarsky DA**, Krucoff MW: Continuous 12-lead ECG in patients undergoing peripheral revascularization: Incidence of ischemia and correlation with fibrinolytic activity. Anesthesiology 85:A72, 1996.

47. **Lubarsky DA**, Gan TJ, Glass PSA, Dear GD, Mythen M, Dentz M, White WD, Pressley CC, Dufore SM, Sibert KS, Gilbert WC, Sanderson IC, Coleman R, Ginsberg B, Temo J, Ferrero-Conover D, Alexander ML, Reves JG: PACU clinical outcomes and financial savings following a pharmaceutical cost containment program in anesthesia using practice guidelines. Anesth Analg 82:S285, 1996.

48. King K, Dear G, Ginsberg B, Gilbert W, **Lubarsky DA**: Cost analyses to develop practice guidelines for muscle relaxants. Anesth Analg 82:S233, 1996.

49. Gan TJ, **Lubarsky DA**, Robertson K, Bennett D, Parrillo S, Sanderson I, Jhaveri R: The hospital cost of perioperative transfusion of a unit of red blood cells and other blood products. Anesth Analg 82:S123, 1996.

50. Sanderson IC, Gilbert WC, **Lubarsky DA**: Cost containment using an automated anesthesia record keeper. Anesth Analg 82:S391, 1996.

51. D'Ercole F, Gilbert W, Smith F, **Lubarsky DA**: Programming an automated anesthesia record keeper to track operating room delays. Anesthesiology 85:A976, 1996.

52. Gan TJ, Ginsberg B, Grichnik K, Sullivan F, Muir M, **Lubarsky DA**, Glass PSA: The use of patient-controlled analgesia to compare the efficacy of sufentanil for postoperative analgesia and its relative potency to morphine. Anesth Analg 80(supple 2):S142, 1995.

53. Gan TJ, **Lubarsky DA**, Robertson K, Bennett D, Parrillo S, Sanderson I, Jhaveri R: The hospital cost of perioperative transfusion of a unit of red blood cells and other blood products. Presented at the Joint Congress on Liver Transplantation, London, Sept. 27-30, 1995.

54. Gan TJ, **Lubarsky DA**, Robertson K, Gilbert WC, Grant AP, Reves JG, Clavien P: Analysis of the variable intra-operative anesthesia costs of a liver transplant procedure. Anesthesiology 83:A1053, 1995.

55. Hertz CM, Pressley CC, Dufore SM, Glass PSA, Gan TJ, **Lubarsky DA**: Nausea and vomiting-a costly anesthetic complication? Anesthesiology 83:A1036, 1995.

56. **Lubarsky DA**, Smith LR, Glass PSA: A comparison of maintenance drug costs of isoflurane, desflurane, sevoflurane, and propofol with OR and PACU labor costs during a 60 minute outpatient procedure. Anesthesiology 83:A1035, 1995.

57. Sanderson IC, Gilbert W, Sibert K, **Lubarsky DA**: Evaluation of a program for calculating and plotting isoflurane utilization. Anesthesiology 83:A388, 1995.

58. Mault J, Cilley R, **Lubarsky DA**, Bartlett R, Reed L: Physiologic and mathematical modeling of the oxygen delivery-consumption relationship. Crit Care Med 22:A105, 1994.

59. **Lubarsky DA**, Hahn C, Bennett DH, Smith LR, Bredehoeft SJ, Klein HG, Reves JG: The hospital cost (1992) of a simple perioperative allogeneic red blood cell transfusion. Anesth Analg 78:S258, 1994.

60. Dentz ME, Lineberger CK, Gilbert W, Ginsberg B, **Lubarsky DA**: Postoperative complications following the use of etomidate for thoracic and vascular surgery. South Med J 87(suppl 2):S12, 1994.

61. **Lubarsky DA**, Smith LR, Sladen RN, Mault JR, Reed RL: Defining the relationship of oxygen delivery and consumption: use of biologic system models. Anesthesiology 79:A303, 1993.

62. **Lubarsky DA**, Kaufman BS: Changes in lactate levels with decreased oxygen delivery and oxygen consumption under anesthesia. Anesth Analg 68:S171, 1989.

63. **Lubarsky DA**, Kaufman BS, Sharnick S, Turndorf H: The effects of induction of anesthesia on mixed venous and peripheral venous oxygen saturations. Anesth Analg 13:S172, 1989.

64. **Lubarsky DA**, Kaufman BS: Oxygen delivery under anesthesia: a prospective evaluation of 330 ML/MIN/M2 as a "critical" value. Anesth Analg 68:S173, 1989.

65. **Lubarsky DA**, Piantadosi C, Camporesi E, Griebel J: Measurement of cytochrome aa3 redox potentials by NIR spectroscopy during normovolemic hemodilution. Anesthesiology 71:A550, 1989.

66. **Lubarsky DA**, Capan L, Turndorf H: Spinal anesthesia–determination of hemodynamics by bioimpedance technique. Regional Anesthesia 13:S37, 1988.

67. **Lubarsky DA**, Sharnick S, Feiler M, Kronenfeld M: The effect of ventilation on aortic blood gases during left ventricular ejection prior to separation from cardiopulmonary bypass. Proceedings of the Society of Cardiovascular Anesthesiologists Annual Meeting, 1988.

Video presentations and other private sector publications:

1. Improving Outcomes Through Effective Management of PONV CD, Ed Source February 2005, Activity made possible through an unrestricted educational grant from Merck & Company.

2. Supportive Care for Surgical Patients: Confronting the Risks of PONV CD, PGA Annual meeting December 12 - 16, 2003, produced by Accel Healthcare Communications.

3. NMB video tape, October 12, 2003, produced by Abbott Pharmaceuticals.

4. "Permission to Be Pain Free™: Understanding Labor Epidurals," conceived, scripted and presented by David A. Lubarsky, Donald H. Penning, and Janice Henderson; produced as a joint venture between Duke University and The Informed Patient, LLC, © 1999.

5. Sevoflurane, PONV Anzemet & Zofran," (Product representative training video). Written and presented by David A. Lubarsky, produced by Abbott Video Services, September 4, 1998.

6. "The Niche for Etomidate in Current Anesthetic Practice" (2 part training tape series distributed to hospitals nationwide), produced by Abbott Laboratories, 1992.

7. "Anesthesia Insites: Midazolam," training video, scripting and appearance by David A. Lubarsky, produced by Roche Laboratories, 1992.

8. "Anesthesia Insites: Romazicon," training video, scripting and appearance by David A. Lubarsky, produced by Roche Laboratories, 1992.

9. "Clinical Uses of Esmolol: Sub-Section for Uses in Vascular Anesthesia" produced by Anaquest, Inc., 1989.

10. "Anesthesia Demands for Cardiac and Vascular Surgery. Part 1: Cardiac Surgery" by Dr. Lubarsky. BOC Health Care, 1989.

11. "Anesthesia Demands for Cardiac and Vascular Surgery. Part 2: Vascular Surgery" by Dr. Lubarsky. BOC Health Care, 1989.

Conference proceedings and newsletters:

1. **Lubarsky, DA**: New Paradigms in the Prevention of Postoperative nausea and Vomiting (PONV). Advisory board participant 59th Postgraduate Assembly in Anesthesiology (PGA), New York City, New York December 9 -13, 2005.

2. **Lubarsky, DA**: Being Part of a Multi-specialty Practice group is not a Good Financial Deal. American Society of Anesthesiologists newsletter September 2005 v. 69; 9.

3. **Lubarsky, DA**: Deriving Value from Informational Systems, New Thoughts on Using NSAIDS in Perioperative Pain Management and Post-Operative Nausea and Vomiting. 29th Annual Vail Conference in Anesthesiology, February 1-8, 2003.

4. **Lubarsky, DA**: Understanding PONV. Postgraduate Assembly 56th Meeting, December 6 - 10, 2002.

5. **Lubarsky, DA**: Main Causes of Delay in In-patient Discharge From PACU in a Major Teaching Hospital. American Society of Anesthesiologists Annual Meeting, October 12 - 16, 2002.

6. **Lubarsky DA**: Are computers useful to reduce costs in outpatient surgery? Society for Ambulatory Anesthesia (SAMBA) 15th Annual Meeting Syllabus, May 5-8, 2000.

7. **Lubarsky DA**: "Putting a Value on Pain, Suffering and Anxiety: Willingness-to-Pay Analyses"
"Pharmaceutical Practice Guidelines";"Computerization in the OR: Electronic Medical Record"
published in the syllabus of the Scott & White Symposium, 6th Annual National Meeting, Santa Fe, NM, June 22-24, 2000 (Scott & White Hospital, Temple, TX).

8. **Lubarsky DA**, Reves JG: Using Medicare multiples results in disproportionate reimbursement for anesthesiologists compared to other physicians. Association of Anesthesia Clinical Directors (AACD) 12th Annual Meeting Syllabus, October, 1999.

9. **Lubarsky DA**: Managing perioperative drug and labor costs. Proceedings of the Society of Cardiovascular Anesthesiologists 20th annual meeting, April 24-28, 1998.

10. **Lubarsky DA**: Managing perioperative drug and labor costs. Proceedings of the Association of Anesthesia Clinical Directors Workshop on Operating Room Management, March 21-22, 1998.

11. Dexter F, **Lubarsky DA**: Managing with information: using surgical services information systems to increase operating room utilization. American Society of Anesthesiologists Newsletter 62(10):6-8, 1998.

12. Macario A, **Lubarsky DA**: Why are hospitals enamored with clinical pathways? American Society of Anesthesiologists Newsletter 62(10):9-12, 1998.

13. **Lubarsky DA**: Intravenous anesthesia is too expensive for my practice! Proceedings

of the Society for Intravenous Anesthesia annual meeting, October 16, 1998.

14. **Lubarsky DA**: Cost-effective ambulatory anesthesia: The anesthesiologist's view. In the Syllabus for the Society for Ambulatory Anesthesia (SAMBA) 12th Annual Meeting, Lake Buena Vista, FL, May 1-4, 1997.

15. **Lubarsky DA**: ICU care after vascular surgery (con). Proceedings of the Society of Cardiovascular Anesthesiologists 19th Annual Meeting, Baltimore, MD, May 11-14, 1997.

16. **Lubarsky DA**: Practice guidelines, information management and resource utilization: Buzzwords for the new millennium. Proceedings of the Association of Anesthesia Clinical Directors Annual Meeting, October 19, 1997.

17. D'Ercole F, **Lubarsky DA**, Reves JG: Duke's innovative programming of an automated anesthetic record yields information essential for economic management of anesthetic practice. North Carolina Society of Anesthesiologists Newsletter, October, 1996.

18. Becker KE, Johnstone RE, **Lubarsky DA**: Choice of anesthetic drugs and muscle relaxants. American Society of Anesthesiologists Newsletter 59(5):8-11, 1995.

19. Cohen NH, **Lubarsky DA**: Cost-effective use of technology in clinical care. American Society of Anesthesiologists Newsletter 59(8):20-22, 1995.

Electronic, world wide web, and/or internet publications:

1. **Lubarsky DA** (Chief Editor and Project Manager): Anesthesiology On-Line. (1000 Chapter Textbook in preparation for emedicine.com)

2. Commentary: 1997: The year in review. In AnesthesiaWeb, January, 1998.

3. Commentary: Notes from the SCA (Society of Cardiovascular Anesthesiologists) annual meeting. In AnesthesiaWeb, June, 1998.

4. Commentary: What was new at the ASA in Orlando. In AnesthesiaWeb, November, 1998.

5. Commentary: What I did on my fall vacation in San Diego. In AnesthesiaWeb, November 1997.

PROFESSIONAL

Funded research performed:

1. Unrestricted educational grant of $36,00.00 on behalf of Picis for the funding of the

operational budget of the Center for Informatics and Perioperative Management (CIPM). Co-Principal Investigator with Dr. Michael Vigoda 2005.

2. Co $10,000 University of Miami Office of the Provost - inter school development grant. Co-Principal Investigator with Dr. Michael Vigoda 2004.

3. Organon, Inc., $36,000 clinical study and research agreement with Organon Inc. These funds will help aid their research project entitled "A Multi-Center Trial to Evaluate the Interaction of Maintenance Doses of Rocuronium with an Intubating Dose of Rapacuronium, Rocuronium, or Succinylcholine." Co-Principal Investigators: Drs. TJ Gan and David Lubarsky, 2000.

4. Aspect Medical Systems, Inc., $22,590 research agreement to support "Willingness to Pay for Avoidance of Awareness During General Anesthesia." Co-Principal Investigators: Drs. David Lubarsky and TJ Gan, 1999.

5. Roche Laboratories, $100,000 grant x 3 years to the Department of Anesthesiology to administer and direct AnesthesiaWeb.com: An Educational Resource for Anesthesia Providers. Dr. Lubarsky, Founder and Chair, Editorial Board 1996-present.

6. North American Dräger - Co-Principal Investigator - $535,000 to $1.5 million contract to develop an Anesthesia Information Management System (AIMS) for Duke University Medical Center and Health System, contracted 1998.

7. Roche - $45,000 unrestricted grant in support of Database Use in Outcomes Research 1996

8. Glaxo-Wellcome - Principal Investigator $25,000 project grant, "Development of Methods to Objectively Value Intangible Elements of Health Care," 1996-97.

9. Abbott Laboratories - Principal Investigator - $35,000 research grant to determine the Cp50 of etomidate and the relationship of myoclonus to plasma levels closed in 1992-3.

10. Sanofi Winthrop Pharmaceuticals - Principal Investigator - $10,000 research grant for the study "Comparison of Amrinone versus Nitroprusside for Hemodynamic Control and Support During Infrarenal Aortic Clamping for Abdominal Aortic Aneurysm Repair," 1993.

11. Abbott Laboratories - $45,000 educational grant for an etomidate study group, 1992.

12. Somatogen - $13,500 educational grant to study the cost of perioperative transfusions, 1992.

Professional organizations:

- American Society of Anesthesiologists, 1988 - Present
- American Medical Association, 1988 - Present
- Association of University Anesthesiologists, 2000 - Present

- International Anesthesia Research Society, 1988 - Present
- Florida Society of Anesthesiologists, 2002 - Present
- North Carolina Society of Anesthesiologists, 1988 - 2002
- Society of Cardiovascular Anesthesia, 1991 - Present

Recent international engagements:

- Invited Speaker - Beta Blockers in Non-Cardiac Surgery: Who, What, When and Why. 20th International Congress of the Israel Society of Anesthesiologists, Tel-Aviv, Israel. September 27 - 29, 2005.

- Featured Speaker - Japanese Society of Anesthesiology, May 2004, Nagoya, Japan.

- Kagoshima University School of Medicine, Department of Anesthesiology & Critical Care, Kagoshima, Japan, May 23 - 29, 2004.

- Commissioned Training in Anaesthesiology 2002/03, Pamela Youde Nethersole Eastern Hospital, Hong Kong [by Dr. Wallace Chiu (wkychiu@ha.org.hk), Chairman, Training Subcommittee in Anaesthesiology, Hospital Authority, Hong Kong] - January 2003
  - Valuing Health Care in 2002
  - Using Information Technology in Medicine - Near Future or False hope?

- Valuing Healthcare lecture XXXIIth International Meeting of Anesthesiology and Critical Care, March 18 & 19, 2000, in Paris, France, Prof. Pierre Coriat, organizer Journees D'Enseignement Post Universitaire (JEPU) (Anesthesiology and Critical Care Conference), Paris, France, March 17-23, 2000. Invited by Dr. Pierre Coriat. Lectures: "Est-on prêt à payer la prise en charge de la douler et de l'anxiété postopératoires?" *or* "Putting a value on pain, suffering and anxiety: willingness to pay?" and "Gestion informatisée des coûtes des agents d'anesthésie" *or* "Managing perioperative drug costs using informatics."

National/state presentations, conferences, speaking and other panel engagements:

Aligning Incentives. Association of Anesthesia Clinical Directors (AACD) Workshop on Operating Room Management, March 10 - 12, 2006.

How to Get What You Want: The Art of Negotiation. Association of Anesthesia Clinical Directors (AACD) Workshop on Operating Room Management, March 10 - 12, 2006.

Southern University Department of Anesthesiology Chairs (SUDAC) Meeting, Guest Faculty, Negotiating with hospitals. March 31 - April 2, 2006.

Arizona Society of Anesthesiologists 32nd Annual Scientific Meeting, Guest Faculty, Finding Value in IT: Near Future or False Hope? February 17 - 19, 2006.

Arizona Society of Anesthesiologists 32nd Annual Scientific Meeting, Guest Faculty, Preventing PONV. February 17 - 19, 2006.

Arizona Society of Anesthesiologists 32nd Annual Scientific Meeting, Guest Faculty, Perioperative Management of the Patient Undergoing Abdominal Aortic Surgery. February 17 - 19, 2006.

SAAC/AAPD, Annual Meeting, session moderator on Training the Anesthesiologist of the Future. Saturday, November 5, 2005.

American Society of Anesthesiologists, Annual Meeting, Refresher Course on Perioperative Management of the Patient Undergoing Abdominal Aortic Surgery. October 22, 2005

American Society of Anesthesiologists, Annual Meeting, Clinical Forum on Cards Consult? Revascularization? Or Just beta-Blocker? October 25, 2005

American Society of Anesthesiologists, Annual Meeting, panel on Pharmaceuticals, Economics and Anesthesia Practice (The Use of Practice Guidelines to Minimize Drug Costs.) October 26, 2004.

American Society of Anesthesiologists, Annual Meeting, panel on Academic Anesthesiology Training Programs - Should you Secede from the Medical School to Better Meet your Academic and Clinical Missions? (Pro: You Should Secede!) October 26, 2004

American Society of Anesthesiologists, Annual Meeting, panel on Practice Management, Oct 14, 2003.

Michigan State Society of Anesthesiologists, April 26, 2003. "Cox-2 Inhibitors: Periprocedural Pain Control and Thoughts on Central Sensitization."

New York State Society of Anesthesiologists, Post Graduate Assembly, panel on the Future of Economics and Anesthesia, Dec 2002.

Panel Chair, Supporting Surgical Outcomes, dinner meeting at PGA, Dec 2002. Presentation, "The Value of PONV therapy."

Medical University of South Carolina Continuing Education Weekend, Charleston, SC, May 4-6, 2001. Lecture: "Current Concepts in Neuromuscular Blockade."

Kansas University Medical Center 51st Annual Postgraduate Symposium on Anesthesiology, Kansas City, Missouri, April 6-8, 2001. Lectures: "Where is the Value in IT?" and "Valuing Healthcare: New Approaches to Costs and Outcomes."

Committee Chair, Drug Information Association workshop in collaboration with the Duke Clinical Research Institute, "Internet Health Information Programs: Integrating Vision and Basic Business Principals," Durham, NC, April 3-4, 2000. Dr. Lubarsky, Program Committee with and Kevin A. Schulman, M.D., M.B.A. (Program Chairperson). Moderator of panel, Specialist content sites. Lecture: "Healthcare Internet Business Models that Work."

Southern University Department of Anesthesia Chairs (SUDAC), Annual Meeting,

Charleston, South Carolina, March 23-25, 2001. Lecture and discussion: "Departmental Practice Plans."

International Anesthesia Research Society 75th Clinical and Scientific Congress, Ft. Lauderdale, Florida, March 16-20, 2001. Lecture: "Valuing Health Care: New Approaches to Costs and Outcomes."

Society for Technology in Anesthesia, "STA 2001: An Information Odyssey," Scottsdale, Arizona, January 10-13, 2001. Coordinator of Panel: "Who is the Information Consumer? User Perspectives on Anesthesia Information," and Lecture "Understanding Value Creation from Information Systems Elucidates Consumers of That Information"

The University of Chicago Department of Anesthesia & Critical Care 14th Annual Conference, "Challenges for Clinicians in the New Millennium," Chicago, Illinois, December 1-3, 2000. Presentations: "Willingness to Pay: Valuing Pain, Suffering & Anxiety in Health Care" and "Understanding the Business of E-Health."

American Society of Anesthesiologists Annual Meeting, San Francisco, CA, October 15-18, 2000. Foundation for Anesthesia Education and Research (FAER) panel on "Information Overload: Data Analysis from Genes to Populations." Lubarsky's presentation: "Clinical Data: Outcomes, Cost and Quality"

Greater Atlanta Society of Anesthesiologists, New Concepts in Neuromuscular Blockade, September 14, 2000

Scott & White Symposium, 6th Annual National Meeting, Santa Fe, NM, June 22-24, 2000. Presentations:
"Putting a Value on Pain, Suffering and Anxiety: Willingness-to-Pay Analyses"
"Pharmaceutical Practice Guidelines"
"Computerization in the OR: Electronic Medical Record"

Society for Ambulatory Anesthesia (SAMBA) Annual Meeting, Washington, DC May 5-8, 2000. Participated on the panel "Managing the Costs of Ambulatory Anesthesia" moderated by Alex Macario, M.D., M.B.A. Presentation: "Are Computers Useful to Reduce Costs in Outpatient Surgery?"
Participated on the panel "Life After Residency" moderated by Peter S.A. Glass, M.B., Ch.B. Presentation: "Managing Your Money."

Committee Chair, Drug Information Association workshop in collaboration with the Duke Clinical Research Institute, Durham, NC, April 3-4, 2000: "Internet Health Information Programs: Overview and Market Opportunities." Dr. Lubarsky, Program Committee with Dr. Robert Califf, Robert Taber, Ph.D., and Kevin A. Schulman, M.D., M.B.A. (Program Chairperson)

New York State Society of Anesthesiologists 53rd Annual Post-Graduate Assembly, New York, NY. Participated on the panel: "The Year 2000: How Computers Will Improve Anesthesia," December 12, 1999. Presentation: "Anesthesia Information Management: Economic Implications."

American Society of Anesthesiologists Annual Meeting, Dallas, TX, October 12, 1999.

Panel: "Practice Management/Compliance Coding-What They Didn't Teach Us in Medical School," Peter B. Kane, M.D., Moderator. Presentation: "Income Redistribution: The Politics of Communism in the OR"

American Society of Anesthesiologists Annual Meeting, Dallas, TX, October 12, 1999. Panel on Value-Based Anesthesia, Peter Rock, Panel Moderator. Presentation: "Quality Improvement and Identification of Key Indicators: Are Electronic Record Keepers the Answer?"

Association of Anesthesia Clinical Directors 12th Annual Meeting, October 10, 1999. Abstract presentation: "Using Medicare multiples results in disproportionate reimbursement for anesthesiologists compared to other physicians."

New York State Society of Anesthesiologists 52nd Annual Post-Graduate Assembly, New York, NY. Participated on the "Fraud and Abuse" panel (Current Issues Forum) December 13, 1998. Presentation: "Making the Plan Work: How to Get Doctors to Do What They Don't Want to Do."

Value-Based Anesthesia Care Committee Panel discussion, (a committee of the American Society of Anesthesiologists), Orlando, FL, October 21, 1998. Presentation: "Anesthesia Practice Management: Practice Guideline and Clinical Pathway Development."

Association of Anesthesia Clinical Directors Panel "Practical Approaches to OR Management" at the American Society of Anesthesiologists annual meeting, Orlando, FL, October 19, 1998. Presentation: "Maximizing Use of an Anesthesia Information Management System in 1998-What's New, What's Left to Do, and Is It for YOU?"

Society for Intravenous Anesthesia (SIVA) Annual Meeting, Orlando, FL, October 16, 1998. Lecture: "Is Intravenous Anesthesia Too Expensive for My Practice?"

Society of Cardiovascular Anesthesiologists (SCA) Workshop on Perioperative Cost Management and Contract Negotiation in Cardiac Surgery, Seattle, WA, April 25, 1998. Lecture: "Managing Drug Costs in the Perioperative Period" and leading a breakout session "Managing Labor Costs in the Perioperative Period." April 27, 1998: Breakfast panel with Dr. Robert Johnstone: "Economics and the Cardiovascular Anesthesiologist."

Association of Anesthesia Clinical Directors workshop on operating room management, Phoenix, AZ, March 20-22, 1998. (Invited by Dr. William Mazzei, University of California-San Diego) Lecture: "Real World Cost Reduction."

Nashville Society of Anesthesiologists, Nashville, TN, September 25, 1997.

Pittsburgh Symposium for Nurse Anesthetists, Pittsburgh, PA, September 27, 1997.

International Anesthesia Research Society annual meeting, San Francisco, CA, March 14-18, 1997. "Anesthesia Information Management: Where Are We?" presented by J.G. Reves, M.D., Thomas E. Stanley, M.D. and the Duke Anesthesia Section on Information Systems (Dr. Lubarsky, member).

Society of Cardiovascular Anesthesiologists 19th annual meeting, Baltimore, MD, May

11-14, 1997. (Invited by Steven Frank, M.D. and Jan C. Horrow, M.D., Chair, Scientific Program Committee) Presentation: "ICU Care After Vascular Surgery (Con)."

American Association of Anesthesia Assistants national meeting, Kiawah Island, SC, May 16-18, 1997. Lectures: "The Clinical Use of Sevoflurane" and "The Niche for Etomidate in Current Anesthetic Practice."

American Society of Anesthesiologists Bi-District Meeting, New Orleans, LA, May 23-25, 1997. (Invited by Donald Harmon, M.D. of the Ochsner Hospital) Lecture: "Cost Containment in Anesthesia."

Association of Anesthesia Clinical Directors annual meeting, San Diego, CA, October 19, 1997. (Invited by Barbara DeRiso, M.D., Director of the AACD) Keynote address: "Practice Guidelines, Information Management and Resource Utilization-Buzzwords for the New Millennium."

NC Society of Anesthesiologists 1996 Annual Fall Meeting in Myrtle Beach, SC, September 20-22, 1996. Lecture: "Value Based Anesthesia: The Academic Experience."

Scott & White Memorial Hospital 5th Annual Anesthesia Update/Resident Research Day, Temple, TX, April 13, 1996. (Invited by Charles McLeskey, M.D.) Lectures: "Pharmaceutical Practice Guidelines" and "Management Controversies for the Patient at Risk for Myocardial Ischemia Undergoing Non-cardiac Surgery." After dinner keynote address: "Economics vs. Hypocrites."

American Society of Anesthesiologists annual meeting, Washington, DC, March 9-13, 1996. Poster presentation: "PACU Clinical Outcomes and Financial Savings Following a Pharmaceutical Cost Containment Program in Anesthesia Using Practice Guidelines." Association of University Anesthesiologists Satellite Symposium on Outcomes Research, Chatham, MA, May 19-21, 1996. Poster presentation: "Pharmaceutical Practice Guidelines in Anesthesia: Implementation, Cost Savings and Outcome"

American Society of Anesthesiologists annual meeting, Morial Convention Center, New Orleans, LA, October 19-23, 1996. Poster Presentation: "Sustaining Cost Savings Through Distribution Control and Individualized Feedback." Poster-Discussion Presentation: "Validation of the Programming of an Anesthesia Information Management System For Cost Calculations."

Society for Intravenous Anesthesia Fourth Annual Meeting, October 20, 1995. Topic: "Does Fast Track Recovery Have Limitless Possibilities?"

Southern University Department of Anesthesia Chairmen (SUDAC) 1995 Annual Meeting, Washington Duke Inn, Durham, NC, April 6-7, 1995. Lecture: "Cost Savings for Hospital and Department-The Duke Plan."

Dallas County Anesthesia Society, Dallas, TX, September 21, 1995.

Tejas Anesthesia, San Antonio, TX, December 7, 1995.

Greater Atlanta Society of Anesthesiologists, Atlanta, GA, November 17, 1994.

Society of Cardiovascular Anesthesiologists Breakfast Panel at the American Society of Anesthesiologists annual meeting, October 17, 1994. Topic on hemodilution: "Will It

Work? How Much Will It Cost?"

First National Duke Heart Center Conference-"Shaping the Future: Innovations in Technology, Quality, and Caring" September 22-24, 1994. Presentation: "Patients at Risk for Ischemia Going to the Operating Room for Non-Cardiac Surgery: Management Controversies"

American Society of Anesthesiologists Annual Meeting, Washington, DC, October 9-13, 1993. Poster presentation: "Defining the relationship of oxygen delivery and consumption: use of biologic system models."

American Society of Anesthesiologists Annual Meeting, New Orleans, LA, October 14-18, 1989. Poster presentation: "Measurement of cytochrome aa3 redox potentials by NIR spectroscopy during normovolemic hemodilution."

Visiting professorships, 2005:

Oklahoma University Health Science Center, Department of Anesthesiology, Oklahoma City, OK, December 15 - 16

Brookwood Medical Center, Department of Anesthesiology, Birmingham, AL, December 5 - 6

Carraway Methodist Hospital, Department of Anesthesiology, Birmingham, AL, December 5 -6

CMC Hospital, Department of Anesthesiology, Charlotte, NC, November 9 - 10

University of Kansas, Department of Anesthesiology, Wichita, Kansas, April 11 - 13

Visiting professorships, 2004:

Brigham & Women's Hospital, Department of Anesthesiology, Boston, MA, October 12

Mount Sinai School of Medicine, Department of Anesthesiology, New York, New York, October 5-7

John Hopkins University, Department of Anesthesiology, Baltimore, MD, August 26 - 27

Greater Baltimore Medical Center, Department of Anesthesiology, Baltimore, MD, August 26 - 27

Kagoshima University School of Medicine, Department of Anesthesiology & Critical Care, Kagoshima, Japan, May 23 - 29

Christiana Hospital, Department of Anesthesiology, Newark, DE, May 11 -12

Visiting professorships, 2003:

Medical College of Georgia, Department of Orthopedics, Macon, Georgia, October 7-8

Hong Kong College of Anesthesiology - lectured at all hospitals in Hong Kong. Hosted by Dr. Wallace Chiu, Pamela Youde Nethersole Eastern Hospital, Department of Anesthesiology, Hong Kong, China, January 6-10

Visiting professorships, 2002:

Washington University, Department of Anesthesiology, St. Louis, Missouri, November 5-6

Baylor University Medical Center, Dallas, Texas, May 21-22 (Grand Rounds: "NMB Update-Re-examining Succinylcholine and it's Alternatives")

University of Wisconsin, Department of Anesthesiology, Madison, Wisconsin, April 2-3

Visiting professorships, 2001:

State University of New York (SUNY) at Stony Brook, Long Island, NY, June 7-8 (Resident lecture: "Understanding Cost Concepts in the Literature" Grand Rounds: "Valuing Health Care: New Approaches to Costs and Outcomes")

University of Miami Medical Center, Department of Anesthesiology, Miami, FL, June 7

Christiana Hospital, Newark, DE, May 30

Peninsula Regional Medical Center, Salisbury, MD, May 29

St. Francis Hospital, Greenville, SC, April 30

University of Texas-Southwestern Medical Center Department of Anesthesiology, Dallas, TX, March 15-16 (Faculty lecture: "What Are Patients Willing to Pay?" Resident lecture: "What Are They Willing to Do About Nausea?")

Atlanta Medical Center Department of Anesthesiology, Atlanta, GA, February 14

Baptist Hospital Anesthesia Group, Pensacola, FL, January 31

Roper and St. Francis Hospitals, Charleston, South Carolina, January 18

Visiting professorships, 2000:

Crawford Long Hospital, Department of Anesthesiology, Atlanta, GA, November 15

St. Luke's-Roosevelt Hospital, Department of Anesthesiology, New York, NY,

November 7.

Christiana Hospital and Health System, Department of Anesthesiology, Newark, DE, May 3.

William Beaumont Hospital, Department of Anesthesiology, Royal Oak, MI, April 12.

Visiting professorships, 1999:

University of Texas-Southwestern Medical Center, Parkland Memorial Hospital, Department of Anesthesiology, April 28, 1999.

University of South Florida, Department of Anesthesiology, Tampa General Hospital, Tampa, FL, April 22, 1999.

Visiting Professor, Department of Anesthesiology, Loma Linda University, Loma Linda, CA, January 27, 1999.

Washington Hospital System, Anesthesiology Department, Washington, DC, January 19, 1999.

Rex Hospital, Department of Anesthesiology, Raleigh, NC, June 3, 1999.

Jackson Memorial Hospital, Department of Oral and Maxillofacial Surgery, Miami, FL, March 11, 1999.

Forsyth Memorial Hospital, Anesthesia Department, Winston-Salem, NC, February 11, 1999.

The Scripps System, Anesthesia Department, San Diego, CA, January 27, 1999

Visiting professorships, 1998

St. Joseph's Hospital System, Anesthesia Department, Albuquerque, NM, November 11, 1998.

University of Michigan, Department of Anesthesiology, Ann Arbor, MI, February 25-26: "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium" and "Management Controversies for the Cardiac Patient Undergoing Non-Cardiac Surgery"

St. Anthony Hospital, Denver, CO, September 28, 1998.

Olean General Hospital, Jamestown, NY, September 16, 1998.

St. Vincent's Medical Center in Worcester, MA, May 20, 1998.

Visiting professorships, 1997

Visiting Professor, Stanford University Medical Center, Department of Anesthesia, Stanford, CA, December 3-4, 1997. (Alex Macario, M.D., M.B.A., host) Wednesday Grand Rounds lecture: "Relational Databases, Benchmarking, Practice Guidelines and

Other Buzzwords of the New Millennium." Thursday afternoon case discussion and evening case discussion with Drs. Vitez, Navarro, Scibetta, Diachun of the Stanford faculty Health Policies Fellowship.

Fletcher Allen Health Care, M.C.H.V. Campus, Burlington, VT, November 20, 1997.

Visiting Professor, New York University Medical Center, Department of Anesthesiology, New York, NY, November 18-19, 1997. (Invited by Herman Turndorf, M.D., Chair) Guest Speaker at Morbidity & Mortality Grand Rounds. Lectured on Wednesday morning: "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium."

Newark Beth Israel Hospital, Newark, NJ, April 7, 1997.

Hackensack University Medical Center, Hackensack, NJ, April 8, 1997.

Hartford Hospital, Hartford, CT, September 4, 1997.

Rhode Island Hospital, Providence, RI, October 8, 1997.

Abbott Northwestern Medical Center, Minneapolis, MN, November 11, 1997.

Visiting Professor, Medical College of Georgia, Department of Anesthesiology, Augusta, GA, November 12, 1997. Conference presentation: "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium." Case presentation.

Doctors of the Medical Center of Columbus, St. Francis and Doctor's Hospitals, Columbus, GA, November 13, 1997.

Keynote speaker at the program "New Advances in Anesthesia," Methodist Hospital, St. Louis Park, MN, November 10, 1997.

Visiting professorships, 1996

Athens Regional and Saint Mary's Hospitals, joint Grand Rounds, Athens, GA, January 18, 1996.

Visiting Professor, Vanderbilt University Department of Anesthesiology, Nashville, TN, February 22, 1996. (Invited by Charles Beattie, M.D., Ph.D., Chairman) Facilitated a multi-departmental task force meeting. Subject: "Expense Reduction-Anesthesia Drugs." Lecture: "Pharmacoeconomics in Anesthesia."

Piedmont Hospital, Atlanta, GA, March 27, 1996.

Tampa General Hospital, Tampa, FL, May 9, 1996.

Richland Memorial Hospital, Columbia, SC, May 16, 1996.

St. Louis University Department of Anesthesiology, St. Louis, MO, August 14, 1996.

The Medical Center of Central Georgia, Macon, GA, August 22, 1996.

Visiting Professor, University of Alabama-Birmingham, Department of Anesthesiology, Birmingham, AL, September 16, 1996. Lectures: "Value Based Anesthesia: The Academic Experience" and "Management Controversies for Cardiac Patients

Undergoing Non-cardiac Surgery"

St. John's Hospital, Queens, NY, September 30, 1996.

Addressed regional gathering of anesthesiologists, Ritz-Carlton Hotel, Boston, MA, May 19, 1996.

Addressed regional gathering of anesthesiologists, The Plaza Hotel, New York, NY, June 9, 1996.

Addressed regional gathering of anesthesiologists, Baltimore, MD, June 30, 1996.

American Association of Nurse Anesthetists national meeting to discuss practice and reimbursement issues when CRNAs and anesthesiologists are working together, Rosemont, IL, September 12, 1996

Visiting professorships, 1995

Baylor University Medical Center, Dallas, TX, September 20, 1995.

Mercy Hospital, Pittsburgh, PA, November 1, 1995.

Visiting Professor, University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, New Brunswick, NJ, November 8, 1995. Lecture: "Management Controversies for the Patient at Risk for Myocardial Ischemia Undergoing Non-cardiac Surgery"

Visiting professorships, 1994

Deaconess Hospital, Boston, MA

Maine Medical Center, Department of Anesthesiology, Portland, ME, August 4, 1994.

Bronx-Lebanon Hospital Center, Department of Anesthesiology, Bronx, NY, November 30, 1994.

Visiting professorships, 1993

New York University Medical Center, New York, NY

Massachusetts General Hospital, Cardiac Division, Boston, MA

University of Medicine and Dentistry of New Jersey, Newark, NJ

Wake Medical Center, Raleigh, NC

Saint Barnabas Hospital, Livingston, NJ

Sutter Hospital, Sacramento, CA

Christiana Hospital, Wilmington, DE

Brandywine Regional Medical Center, Coatesville, PA

Englewood Hospital, Englewood, NJ

Non-physician presentations, 2001

Draeger Global Management Team Meeting, at the R. David Thomas Center of the Fuqua School of Business, Duke University, February 1, 2001. Presentation: "The Value of Information Technology."

Chair, Roche Pharmaceuticals, Advisory panel on PONV, Miami FL Dec 2001. "Understanding the pharmacoencomics of PONV agents"

Pain Management Advisory Board, Pfizer/Pharmacia

Non-physician presentations, 2000

Chair, Pharmacoeconomic Council on Neuromuscular Blocking Agents Retreat, Organon, Inc., St. Thomas, VI, May 19-21, 2000

Remifentanil Advisory Board, Abbott Laboratories, Chicago, IL, May 12-13

Vertebrae Medical Advisory Board (an Internet company to support web-medicine), Westchester, NY, May 12

Cox-II/Parecoxib - U.S. Health Outcomes Advisory Group Meeting, Searle, Chicago, IL, April 24-25

Dexmedetomidine Advisory Panel, Abbott Laboratories, Aventura, FL, March 3-5

Trainer, Abbott Laboratories Perioperative Services Meeting, Dallas, TX, February 6

AnesthesiaWeb Position Strategy Meeting, New York, NY, January 12.

Other presentations, 1998

"The Impact of Inhalation Agents on Global Cost," Cog Hill Golf and Country Club, Lemont, IL, September 4, 1998.

Addressed the North American Dräger national sales meeting, Philadelphia, PA, March 29, 1998. Lecture: "Anesthesia Information Systems of the New Millennium."

Addressed the Abbott Laboratories national sales training meeting, Ft. Lauderdale, FL, February 3, 1998. Lecture: "The Economics of Postoperative Nausea and Vomiting."

Non-physician presentations, 1997

Addressed Abbott Laboratories national product development group, Chicago, IL, March 24, 1997. Lectures: "Types of Studies to Determine Cost Justification" and "Economic

Trends and Issues in Health Care Related to Anesthesia."

Addressed Abbott Laboratories national sales training meeting, Chicago, IL, July 27-30, 1998. Lectures: "Clinical Implications of Package Insert Changes" and "Cost Perspectives: Low Flow Sevoflurane."

Non-physician presentations, 1996

Panama City, FL, March 6, 1996.

Addressed the Amidate® (etomidate) Advisory Board of Abbott Laboratories, meeting in Washington, DC, March 8, 1996. Lecture: "General Cost Concepts and Cost Justification for Etomidate"

Addressed the Abbott Laboratories Sevoflurane Speakers Development Meeting, Hotel Sofitel, Rosemont, IL, May 17-18, 1996. Lecture: "The Cost Justification for Sevoflurane."

Other presentations, 1994

Lectured at the Osler Anesthesiology Review Course, Ft. Lauderdale, FL, February 14-15, 1994. Lectures: "Trauma," "How to Take the Written Boards," "How to Take the Oral Boards," "Anesthesia for Carotid Endarterectomy," "A Comparison of Induction Agents," "Management Controversies," "Answering Strategies for the Oral Boards".

Other presentations, 1993

Lectured at the Osler Anesthesiology Review Course, Chicago, IL, August 9-14, 1993. Lectures: "Recovery Room," "Answering Strategies for the Board Exams," "The Induction Agent for the Boards," "Carotid Endarterectomy," "Pre-operative Evaluation I," "How to Take Board Exams," and "Pre-operative Evaluation II."

Lectured at the Osler Anesthesiology Review Course, Tampa, FL, January, 1993. Lecture: "How to Take the Oral Board Exam."

Editorial and review board positions:

1. Co - Editor-in-chief of Anesthesiology , the electronic anesthesia textbook on emedicine.com. Under construction.
2. AnesthesiaWeb, a World Wide Web site developed for the anesthesia community (accumulated 16,000 subscribers, the largest anesthesia e-magazine in the world), Chair, Editorial Board, October 1996-2002.
3. Journal of Clinical Anesthesia, Section Editor, Cost Containment and Operations Improvement, 1995-present.

4. **Lubarsky, DA:** Abstract Reviewer on Economics, Education and Patient Safety. 77th and 78th Annual IARS Congress, March 27 - 31, 2004

5. Journal of Clinical Monitoring and Computing, Section Editor, Information Systems, 1999-2002

6. Anesthesiology, Guest Reviewer, 1996-present.

7. Anesthesia and Analgesia, Guest Reviewer, 1991-present.

8. Cardiovascular and Thoracic Anesthesia Journal Club Journal - Section Editor, Vascular Anesthesia, 1996-1999.

9. Anesthesia Cost Containment bulletin board on the Internet, Coordinator and Initiator, 1995.

10. TranspO2rt, Contributing Editor, 1993-1994.

11. Butterworths Publishing Company, Boston, Guest Reviewer of anesthesia texts, 1991-93.

Teaching

Awards:

- Medical Student "Teacher of the Year" Award, 1990.
- Fuqua Scholar Award, 1999.

Teaching specialization:

- Mentor to cost effective care clerkship
- Annual advisee to multiple residents

Lectures for Fuqua School of Business Course "Informatics, the internet, and healthcare"
Fall 2000, Term I (Course repeated with update Fall 2001, Term I)

- "Informatics, The Internet and Healthcare: Introduction and Overview," August 28
- "IT Development and Value," "EMR Ideals and Recap," "Functionality of Other HIS," August 31
- "Resource Utilization Control Using Informatics Systems," September 4
- "The Medicalogic Business Model - ROI for EMR," Sept. 7
- "Introduction to The Internet," and B2B business exchanges September 11
- "MD2MD Texts, Journals, CME and Intellectual Property," September 14
- "The Regulatory Environment," September 18
- "Content Sites," Sept 21
- "Medical Care Over the Internet," Sept 28

Spring 2001, Term 3

- "Operations Management Seminar, Department of Operations: Healthcare and Management Science," March 5

University Lectures

University of Miami - School of Medicine Educational Lectures 2002

Duke University Medical Center Educational Lecture, 2001

- Resident Lecture: "How to Value Health Care."
- Medical Student 2nd year Medical Practice in Health Systems (MPS 206C.82) Lectures, "Understanding Cost Concepts in the Literature."

Duke University Medical Center Educational Lectures, 2000

- Resident Lecture: "Management Controversies for the Patient At-Risk for Myocardial Ischemia Undergoing Non-Cardiac Surgery."
- Medical Student 2nd year Medical Practice in Health Systems (MPS 206C.82) Lectures, "Understanding Cost Concepts in the Literature."

Duke University Medical Center Educational Lectures, 1999

- Anesthesiology Resident Lecture, "Contracts, Reimbursement, and Compliance Issues"
- CA-1 Resident Orientation Lecture, "PACU Issues and Transport"
- Medical Student 2nd year Medical Practice in Health Systems (MPS 206C.82) Lectures, "Understanding Cost Concepts in the Literature."

Duke University Medical Center Educational Lectures, 1998

- Medical Student 2nd year Medical Practice Health Systems Lecture, "Understanding Cost Concepts in the Literature"
- CA-1 Resident Orientation Lecture, "PACU Issues and Transport"
- Resident Lecture, "Preparing for the Oral Boards"
- Medical Student 2nd year Medical Practice Health Systems Lecture, "Understanding Cost Concepts in the Literature"
- Resident and Residency Graduate All-day Seminar, "Preparing for the Anesthesia Orals"

Duke University Medical Center Educational Lectures, 1997

- Grand Rounds, "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium"
- Anesthesiology Resident Lecture, "Understanding Cost Concepts in the Literature: Part 2"
- Medical Student 2nd year Medical Practice Health Systems Lecture, "Understanding Cost Concepts in the Literature"
- Anesthesiology Resident Lecture, "Understanding Cost Concepts in the Literature: Part 1"

- Resident Lecture, "Controversies in Care of the Patient with Coronary Artery Disease for Non-cardiac Surgery"
- Resident and Residency Graduate Weekend Seminar, "Preparing for the Anesthesia Orals"
- Medical Student 2nd year Medical Practice Health Systems Course (previously called the Cost-Effective Care Clerkship), Lecture, "Understanding Cost Concepts in the Literature"
- Resident Lecture, "Common PACU Problems"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- CRNA Staff Meeting Presentation, "New Medicare Teaching Physician Rules: How They Affect the Anesthesia Care Team"
- Resident and Residency Graduate Weekend Seminar, "Preparing for the Anesthesia Orals"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"

Duke University Medical Center Educational Lectures, 1996

- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Resident and Residency Graduate Weekend Seminar, "Preparing for the Anesthesia Orals"
- Resident Lecture, "Common Problems and Decision Making"
- Departmental Grand Rounds, "Morbidity and Mortality"

- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Departmental Grand Rounds, with Dr. JG Reves, Department Chairman, "The New HCFA (Medicare) Guidelines"
- Resident lecture, "New Medicare Teaching Rules--How They Affect You, the Resident." (Short presentation followed by Question & Answer Session on the Introduction of New Departmental Policies)
- Departmental Grand Rounds, "Cost Containment"
- Resident Lecture, "Preoperative Evaluation of the Cardiac Patient for Non-Cardiac Surgery"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Critical Care Grand Rounds, "Cost Containment in the ICU"

Duke University Medical Center Educational Lectures, 1995

- Medical Student 2nd year Cost Effective Care Clerkship Tutorial Sessions
- Anesthesiology Resident Lecture, "Common Problems in Anesthesia"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Anesthesiology Resident Lecture, "Common Problems in Anesthesia"
- Grand Rounds in Family Medicine, "Understanding Cost Concepts in the Literature"

- Anesthesiology Resident Lecture, "Board Review"
- Medical Student 2nd year Anesthesiology Rotation Lecture, "Hemodynamic Monitoring"

Duke University Medical Center Educational Lectures, 1994

- Current Topics in Vascular & Thoracic Anesthesia (CME Category 1 departmental conference), "Prevention of Endotracheal Tube-Induced Coughing During Emergence from General Anesthesia" with Dr. Daryl Malak
- CA-1 Resident Orientation Lecture, "Recovery Room Problems (& Transport): Basic Clinical Problem Solving"
- Current Topics in Vascular & Thoracic Anesthesia (CME Category 1 departmental conference), "Infection Control in Anesthesia" with Dr. Josef Grabmayer
- Anesthesiology Resident Lecture (Vascular & Thoracic Series), "Management Controversies for the Patient at Risk for Myocardial Ischemia Undergoing Non-cardiac Surgery"
- Current Topics in Vascular & Thoracic Anesthesia (CME Category 1 departmental conference), "Cell Saver: To Use or Not to Use?" with Dr. Nancy Knudsen

National board review courses (Invited lectures given multiple times 1991-1995):

"How to Take the Oral Board Exam"
"Carotid Endarterectomy"
"Oral Exam Answering Strategies"
"Pre-operative Evaluation-History and Physical Exam"
"Pre-operative Evaluation-Labs and Tests"
"Written Questions and Answers"
"Recovery Room-Differential Diagnoses and Therapies for Common Clinical Problems"
"Induction Agents for the Boards"
"Trauma Anesthesia"

SERVICE

Committees and offices:

Florida Society of Anesthesiologists:
FSA Board Member 2003
Ad hoc non-voting Board invitee 2002 - 2003

American Society of Anesthesiologists (ASA)
ASA Delegate for FSA, 2003
Committee on Economics 2003- present
Committee on Information Management 2002-3
Committee on Electronic Media and Information Technology, 2001-2.
Committee on Value Based Anesthesia Care 1995-1999
Task Force on Value-Based Anesthesia 1994 - 1995
Ad Hoc Committee on Health Outcomes in Anesthesia, chaired by Alex Macario, M.D., M.B.A. (October, 1997 - present)

University of Miami-School of Medicine
Chair, Department of Anesthesiology overseeing 25MM annual budget, 300 employees

including 130 interns, residents and fellows, the largest training program in the world.
Medical Center Internet Group Chief Search 2002-2003
Governing Board 2001-present

Duke University Medical Center and Health System
Duke University Hospital, Perioperative Executive Committee, 2000 - 2002.
Duke University Health System/Duke University Medical Center Internet Advisory Committee, 2000 - 2002.
Managed Care Committee (PDC = Private Diagnostic Clinic = 850 MD paratnerhsip) and PDC representative to Managed Care Coordination Group (Duke University Health System and PDC) 2001-2002.
Private Diagnostic Clinic Business Strategy Committee, 1999 - 2002.
Steering Committee, Duke University Health System Revenue Management Initiative, October, 1999 - 2002.
Organizer, Duke University Medical MBA's (an internal consulting group for the Duke University Health System), 1999.
Physician Co-Director, Private Diagnostic Clinic (HCFA/CMS) Compliance Committee, March, 1997 - 2002.
Administration and Citizenship Work Group, managed by Provider Transition Strategies, LLC, charged with implementing a physician performance improvement system within the Duke Health System, February, 1998 - February, 1999.
Perioperative Services Advisory Committee, 1997 - 2002.
Faculty of Medical School cost-effective care course, 1995 - 2002.
Private Diagnostic Clinic Retirement Trust Plan Committee, representing the Departments of Anesthesiology, Pathology, Radiation Oncology and Radiology, 1995 - 2002.
Product Standardization Committee, Departmental Representative, May, 1995 - 1996.
Medical Center Cost Effectiveness Committee, January, 1995 - 2002.
Task Force on Teaching Cost Effectiveness, April, 1994 - June, 1995.

Duke Hospital Operations Improvement Steering Committee, 1994 - 1996.
Operating Room Mission Statement Committee, 1994.
Pharmacoeconomics Committee, 1994.
Liaison to Operating Room Clinical Laboratories, 1994 - 2002.
Task Force to Choose Managed Care Partners, 1994.
Duke University Medical Center, Hospital Budget Advisory Committee and Capital Equipment Committee, 1991 - 1994.

Duke Department of Anesthesiology
Chairman, Finance Committee, January, 1991-2002.
Chairman, Equipment, Supplies, and Product Standardization Committee, 1996-2002.
Coordinator, Practice Guidelines Development, 1994-2002.
Coordinator, Drug Utilization Review, 1995-2002.
Director, Outside Hospital Anesthesia Service Contracts, 1996-2002.
Physician Director of Reimbursement Analysts, 1996-2002.
Departmental Compliance Officer
Developer of departmental wide staffing model & incentive plans
Direct supervision of business office and business manager
Chief, Division of General/Vascular/Transplant Anesthesia and Surgical Critical Care Medicine (12 attendings, 10 CRNAs, 2-4 residents, 2-4 fellows, 8 PA's in preop screening unit) 1998-2002

Coordinator/creator, Current Topics in Vascular and Thoracic Anesthesia, a weekly CME Category 1 approved conference, July 1991-July 1998.
Director, Departmental Retreat, July 1994, "Upping the Pace of ACE (Anesthesia Cost Effectiveness)".
Resident Education Committee, 1991-1994.
Director, Mock Oral Board Review Course, 1989-2002.

Appendix A

Electronic, World Wide Web and/or Internet Publications:
List of all literature reviews done for AnesthesiaWeb (http://www.anesthesiaweb.com)

1. Literature review: Dexter F et al: Decreases in anesthesia-controlled time cannot permit one additional surgical operation to be reliably scheduled during the workday. Anesth Analg 81:1263-8, 1995 in AnesthesiaWeb, November, 1996

2. Literature review: Dexter F and Tinker J: Analysis of strategies to decrease postanesthesia care unit costs. Anesthesiology 82:94-101, 1995 in AnesthesiaWeb, November, 1996

3. Literature review: Connors AF Jr et al: The effectiveness of right heart catheterization in the initial care of critically ill patients. JAMA 276:889-97, 1996 and the accompanying editorial: Should a moratorium be placed on sublingual nifedipine capsules for hypertensive emergencies and pseudoemergencies. JAMA 276:1328 in AnesthesiaWeb, December, 1996

4. Literature review: Mangano et al: Review of effect of atenolol on mortality and cardiovascular morbidity after noncardiac surgery. N Engl J Med 335:1713, 1996 and accompanying editorial, Eagle and Froelich: Reducing cardiovascular risk in patients undergoing noncardiac surgery. N Engl J Med 335(23):1761, 1996 in AnesthesiaWeb, January 1997

5. Literature review: Katz SG and Kohl RD: Selective use of the intensive care unit after nonaortic arterial surgery. J Vasc Surg 24:235-9, 1996 in AnesthesiaWeb, February, 1997

6. Literature review: Wright I et al: Statistical modeling to predict elective surgery time. Anesthesiology 85:1235-45, 1996 in AnesthesiaWeb, February, 1997

7. Literature review: Twersky R et al: What happens after discharge? Return hospital visits after ambulatory surgery. Anesth Analg 1997;84:319-24 in AnesthesiaWeb, March, 1997

8. Literature review: Blum U et al: Endoluminal stent grafts for infrarenal abdominal aortic aneurysms. N Engl J Med 1997;336:13-20 in AnesthesiaWeb, March, 1997

9. Literature review: Claxton AR, et al: Evaluation of morphine versus fentanyl for postoperative analgesia after ambulatory surgical procedures. Anesth Analg 1997; 84:509-514 in AnesthesiaWeb, April 1997

10. Literature review: Valenzuela RC, Johnstone RE: Cost containment in anesthesiology: a survey of department activities. J Clin Anesth 1997; 9:91-92 in AnesthesiaWeb, April 1997

11. Literature review: Rotondi AJ, et al: Benchmarking the perioperative process. I. Patient routing systems: A method of patient flow and resource utilization. J Clin

Anes 1997; 9:159-169 in AnesthesiaWeb, May 1997

12. Literature review: Woolhandler S, Himmelstein DU: Costs of care and administration at for-profit hospitals and other hospitals in the United States. N Engl J Med 1997;336:769-774 in AnesthesiaWeb, May 1997

13. Literature review: Frank SM, et al: Perioperative maintenance of normothermia reduces the incidence of morbid cardiac events: a randomized clinical trial. JAMA 1997;277:1127-1134 in AnesthesiaWeb, June 1997

14. Literature review of a 3-article series: Part 1. Russell LB, et al: The role of cost-effectiveness analysis in health and medicine. JAMA 1996; 276:1172-1177
Part 2. Weinstein MC, et al: Recommendations of the Panel on Cost-Effectiveness in Health and Medicine. JAMA 1996;276:1253-1258
Part 3. Siegel JE, et al: Recommendations for reporting cost-effectiveness analyses. JAMA 1996;276:1339-1341
all reviewed in AnesthesiaWeb, July 1997

15. Literature review: Kharasch ED, et al: Assessment of low-flow sevoflurane and isoflurane effects on renal function using sensitive markers of tubular toxicity. Anesthesiology 1997; 86:1238-1253 and accompanying editorial, Mazze RI, Jamison RL: Low-flow (1 l/min sevoflurane): is it safe? Anesthesiology 1997;86:1225-7 in AnesthesiaWeb, August 1997

16. Literature review: Bito H, et al: Effects of low-flow sevoflurane anesthesia on renal function: comparison with high-flow sevoflurane anesthesia and low-flow isoflurane anesthesia. Anesthesiology 1997; 86:1231-1237 in AnesthesiaWeb, August 1997

17. Literature review: Kearon C, Hirsh J: Management of anticoagulation before and after elective surgery. N Engl J Med 1997; 336:1506-1511 in AnesthesiaWeb, September 1997

18. Literature review: Rooke GA, et al: Hemodynamic response and change in organ blood volume during spinal anesthesia in elderly men with cardiac disease. Anesth Analg 1997;85:99-105 in AnesthesiaWeb, September 1997

19. Literature review: Ballantyne JC, Chang Y: The impact of choice of muscle relaxant on postoperative recovery time: A retrospective study. Anesth Analg 1997;85:476-82 in AnesthesiaWeb, October 1997

20. Literature review: Caldwell JE: The problem with long-acting muscle relaxants? They cost more! Anesth Analg 1997;85:473-475 in AnesthesiaWeb, October 1997

21. Literature review: Snaidach MS, Alberts MS: A comparison of the prophylactic antiemetic effect of ondansetron and droperidol on patients undergoing gynecologic laparoscopy. Anesth Analg 1997; 85:797-800 in AnesthesiaWeb, December, 1997

22. Literature review: Vogt AW, Henson LC: Unindicated preoperative testing: ASA physical status and financial implications. J Clin Anes 1997; 9:437-441 in

23. Literature review: Lee TH, Cooper HL: Translating good advice into better practice. (editorial) JAMA 1997;278:2108-2109 and Stiell IG, et al: Implementation of the Ottawa Knee Rule for the use of radiography in acute knee injuries. JAMA 1997;278:2075-2079 in AnesthesiaWeb, February, 1998

24. Literature review: Pierce ET, et al: Anesthesia type does not influence early graft patency or limb salvage rates of lower extremity arterial bypass. J Vasc Surg 1997;25:226-233 in AnesthesiaWeb, February, 1998

25. Literature review: Olsen MF et al: A randomized controlled trial of prophylactic chest physiotherapy in major abdominal surgery. Br J Surg 1997; 84:1535-1538 in AnesthesiaWeb, April, 1998

26. Literature review: Pollard JB, et al: Use of outpatient preoperative evaluation to decrease length of stay for vascular surgery. Anesth Analg 1997;85:1307-11 in AnesthesiaWeb, April, 1998

27. Literature review: Cher DJ, Lenert LA: Method of Medicare reimbursement and the rate of potentially ineffective care of critically ill patients. JAMA 1997;278:1001-1007 in AnesthesiaWeb, May, 1998

28. Literature review: O'Connor PG, Kosten TR: Rapid and ultrarapid detoxification techniques. JAMA 1998;279:229-234 in AnesthesiaWeb, May, 1998

29. Literature review: Badner NH, et al: Myocardial infarction after noncardiac surgery. Anesthesiology 1998;88:572-578 in AnesthesiaWeb, July, 1998

30. Literature review: Overdyk FJ, et al: Successful strategies for improving operating room efficiency at academic institutions. Anesth Analg 1998;86:896-906 in AnesthesiaWeb, July, 1998

31. Literature review: Leung JM, et al: Automated electrocardiograph ST segment trending monitors: Accuracy in detecting myocardial ischemia. Anesth Analg 1998; 87:4-10 in AnesthesiaWeb, August, 1998

32. Literature review: Swamidoss CP, et al: Health-care report cards and implications for anesthesia. Anesthesiology 1998; 88:809-819 in AnesthesiaWeb, August, 1998

33. Literature review: Fortney JT, et al: A comparison of the efficacy, safety, and patient satisfaction of ondansetron versus droperidol as antiemetics for elective outpatient surgical procedures. Anesth Analg 1998;86:731-8 in AnesthesiaWeb, September, 1998

34. Literature review: Vitez TS and Macario A: Setting performance standards for an anesthesia department. J Clin Anesth 1998;10:166-75 in AnesthesiaWeb,

February, 1999

35. Literature review: Fleisher LA and Barash PG: Percutaneous transluminal coronary angioplasty before noncardiac surgery: current state of the debate. (editorial) J Cardiothorac Vasc Anesth 1998;12:499-500 in AnesthesiaWeb, February, 1999

36. Literature review: Bennett-Guerrero E, et al. The use of postoperative morbidity survey to evaluate patients with prolonged hospitalization after routine, moderate-risk, elective surgery. Anesth Analg 1999;89:514-519 in AnesthesiaWeb, October, 1999

37. Literature review: Posner KL, Freund PR: Trends in quality of anesthesia care associated with changing staffing patterns, productivity, and concurrency of case supervision in a teaching hospital. Anesthesiology 1999; 91:839-47 in AnesthesiaWeb, January, 2000

38. Literature review: Prielipp RC, et al: Ulnar nerve pressure: influence of arm position and relationship to somatosensory evoked potentials. Anesthesiology 1999; 91:345-54 with editorial Caplan RA: Will we ever understand perioperative neuropathy? A fresh approach offers hope and insight. Anesthesiology 1999; 91:335-6 in AnesthesiaWeb, January 2000

39. Literature review: Ramsey SD, Saint S, Sullivan SD et al: Clinical and economic effects of pulmonary artery catheterization in nonemergent coronary artery bypass graft surgery. J Cardiothorac Vasc Anesth 14(2) April 2000 113-118, in AnesthesiaWeb, June 2000

40. Literature review: Johnstone RE, Hosaflook C: Financial impact if payers use Medicare rates. Anesthesiology 2000; 93:852-7 in AnesthesiaWeb, October 2000

41. Literature review: Tobias JD: Fenoldopam: Applications in anesthesiology, perioperative medicine, and critical care medicine. Am J Anesthesiology 2000; 27(7):395-401 in AnesthesiaWeb, December 2000

Appendix B
Editorials Accompanying Articles:
(Numbers refer to the article listed on Lubarsky's CV)

15 & 16. Shapiro BA: Why must the practice of anesthesiology change? It's economics, Doctor! Anesthesiology 86:1020-1022, 1997 and
Fisher DM, Macario A: Economics of anesthesia care. A call to arms! Anesthesiology 86:1018-1019, 1997

20. Miller RD, Rampil L, Cohen N: Fewer residents: financial, educational, and practical implications. Anesth Analg 87:242-244, 1998

23. Mazzei WJ: Maximizing operating room utilization: a landmark study. Anesth Analg 89:1-2, 1999

26. Chestnut DH: How do we measure (the cost of) pain relief? Anesthesiology 92:643-645, 2000

27. Watcha MF: The cost-effective management of postoperative nausea and vomiting. Anesthesiology 92:931-3, 2000

Exhibit 2 to Dr. David Lubarsky 2007 Affidavit

Inadequate anaesthesia in lethal injection for execution

Lancet 2005; 365: 1412–14

Leonidas G Koniaris, Teresa A Zimmers, David A Lubarsky, Jonathan P Sheldon

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LKoniaris@med.miami.edu

Anaesthesia during lethal injection is essential to minimise suffering and to maintain public acceptance of the practice. Lethal injection is usually done by sequential administration of thiopental, pancuronium, and potassium chloride. Protocol information from Texas and Virginia showed that executioners had no anaesthesia training, drugs were administered remotely with no monitoring for anaesthesia, data were not recorded and no peer-review was done. Toxicology reports from Arizona, Georgia, North Carolina, and South Carolina showed that post-mortem concentrations of thiopental in the blood were lower than that required for surgery in 43 of 49 executed inmates (88%); 21 (43%) inmates had concentrations consistent with awareness. Methods of lethal injection anaesthesia are flawed and some inmates might experience awareness and suffering during execution.

Since 1976, when the death penalty was reinstated, 959 people have been executed in the USA.[1] Lethal injection has eclipsed all other methods of execution because of public perception that the process is relatively humane and does not violate the Eighth Amendment prohibition against cruel and unusual punishment. US courts recognise "evolving standards of decency that mark the progress of a maturing society", and prohibit punishments that "involve the unnecessary and wanton infliction of pain", "involve torture or a lingering death", or do not accord with "the dignity of man".[2]

Lethal injection usually consists of sequential administration of sodium thiopental for anaesthesia, pancuronium bromide to induce paralysis, and finally potassium chloride to cause death.[3] Without anaesthesia, the condemned person would experience asphyxiation, a severe burning sensation, massive muscle cramping, and finally cardiac arrest. Thus, adequate anesthesia is necessary both to mitigate the suffering of the condemned and to preserve public opinion that lethal injection is a near-painless death. By contrast with its medical applications, however, anaesthesia in execution has not been subjected to clinical trials, governmental regulation, extensive training of practitioners, standardisation, or the supervision of peer-review and medicolegal liability. Furthermore, the American Medical Association and American Nurses Association strictly oppose participation of their members in executions. We postulated that anaesthesia methods in lethal injection might be inadequate.

To assess anaesthesia methods, we sought protocol information from the states of Texas and Virginia, where 45·4% of executions are done, by a combination of statutory records requests to the Texas Department of Criminal Justice and the Virginia Department of Corrections, along with personal interviews and sworn testimony of corrections officials involved in executions. We noted that: neither state had a record of the creation of its protocol (Texas Department of Criminal Justice Assistant General Counsel, January and February, 2004; and Virginia Department of Corrections Director of Communications, December, 2003; written communications); executioners—typically one to three emergency medical technicians or medical corpsmen—had no training in anaesthesia (Virginia Department of Corrections Director of Communications, written communication; and personal interview of a former senior Texas corrections official who witnessed 219 Texas executions: hereafter "personal interview");[4] after placement of one or two intravenous lines, executioners stepped behind a wall or curtain and remotely administered drugs to the conscious inmate (personal interview);[4] no direct observation, physical examination, or electronic monitoring took place for anaesthesia (personal interview);[4] and there was no data collection, documentation of anaesthesia, or post-procedure peer review (Virginia Department of Corrections Director of Communications, written communication; and personal interview). No assessment of depth of anaesthesia or loss of consciousness was done: apparently anaesthesia is assumed because a relatively large quantity of thiopental is specified (usually 2 g) compared with the typical clinical induction dose of 3–5 mg/kg, immediately followed by 1–1·5 mg/kg per min for maintenance; this dose equates to 270–450 mg for induction and 90–135 mg/min maintenance for a 200 lb man.

The assumption that 2 g thiopental assures anaesthesia is overly simplistic, however. First, technical difficulties or procedural errors by poorly trained executioners might hinder administration of the total dose. Second, if thiopental anaesthesia were maintained at standard infusion rates, the total dose for a 10-min procedure in a 100 kg man would be 1·3–2·0 g. Thus the dose used is not excessive for the average time from injection to death (8·4 min, SD 4·7) and might be inadequate if the process took longer.[4] Third, a person anticipating execution would be fearful, anxious, and hyperadrenergic, and would need a higher dose of thiopental than would a premedicated surgical patient. Fourth, inmates with histories of chronic substance misuse problems might have high tolerance to sedative hypnotics and would need increased doses of anaesthetic.

Because no documentation of anaesthesia in the execution chamber existed, the only available objective data were postmortem concentrations of thiopental. Texas and Virginia refused to provide such data, but we obtained autopsy toxicology results from 49 executions in

Arizona, Georgia, North Carolina, and South Carolina. Toxicology reports were generated by MedTox Laboratories (St Paul, MN) for Arizona and are available in Beardslee versus Woodford, No C-04-5381 (Northern District of California, 2004). Data from the Division of Forensic Sciences Georgia Bureau of Investigation are available in State versus Nance, Superior Court Indictment No 95-B-2461-4. North Carolina reports were obtained directly from the Office of the Chief Medical Examiner. South Carolina Law Enforcement Division Toxicology Department reports were obtained by attorney David Barron, Kentucky Department of Public Advocacy Capital Post-Conviction Unit (personal communication) and are available in Hill versus Ozmint, No 2:04-0489-18AJ (District of South Carolina, 2004). Although the protocols of all four states are similar to those of Texas and Virginia, and specify that 2 g

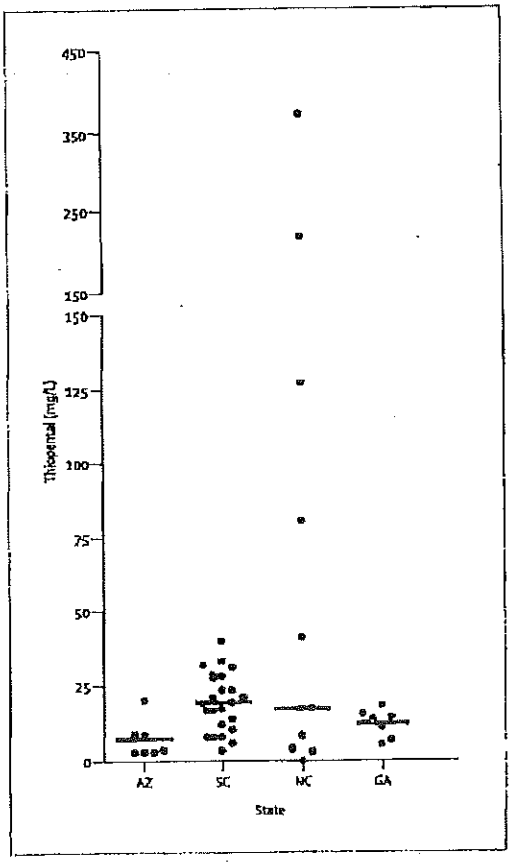

Figure 1: Individual post-mortem thiopental concentrations in blood by state

Lines show medians. Note different scales. GA sampled several sites in five individuals; the highest values are shown. GA values were reported as plus or minus 25%. AZ and SC did not report site of blood sampling. NC results were each from a single site, including subclavian artery, jugular vein, femoral vein, or vena cava.

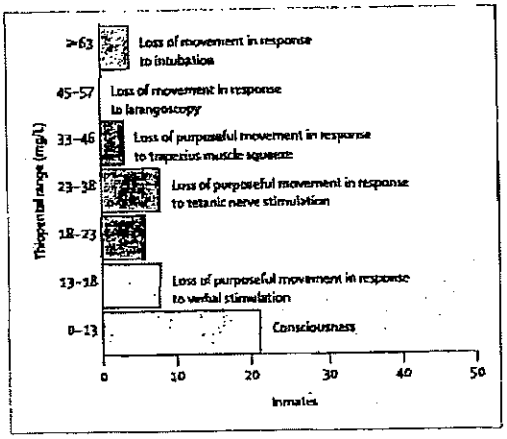

Figure 2: Number of executed inmates with post-mortem thiopental concentrations within range for indicated clinical endpoint

Ranges are 95% CI of the Cp50 for the stimuli.

thiopental is used, concentrations of the drug in the blood ranged from only trace amounts to 370 mg/L (median 15·5 mg/L; figure 1). Thiopental concentrations did not fall with increased time between execution and blood sample collection (data not shown), consistent with data showing that thiopental is quite stable in stored human plasma.[8]

Extrapolation of antemortem depth of anaesthesia from post-mortem blood thiopental concentrations is admittedly problematic. To estimate concentrations of thiopental in the brain from concentrations in the blood in life, details of the rate and duration of drug administration are needed. Unfortunately, such details are usually not specified in lethal injection protocols. Furthermore, no data about post-mortem distribution of thiopental are available. However, a large range of blood concentrations resulted from nearly identical protocols across and within individual states—from 8·2 mg/L to 370 mg/L in North Carolina for the same sampling site (subclavian artery) and similar collection times (same day or next day, respectively). This finding suggests substantial variations in either the autopsy or anaesthesia methods. Contrasting the expertise of state medical examiners with the relatively unskilled executioners, however, would strongly suggest that the variation is probably due to differences in drug administration in individual executions.

If post-mortem thiopental concentrations are taken as a surrogate marker of concentrations in the blood during life, most of the executed inmates had concentrations that would not be expected to produce a surgical plane of anaesthesia, and 21 (43%) had concentrations consistent with consciousness (figure 2). In a careful study in which actual serum thiopental concentrations were measured against clinical endpoints, the steady state serum concentration needed to produce a 50% probability of no

muscle response (Cp50) after intubation was defined as 78·8 mg/L (SD 2·9).[1] The Cp50 for movement after trapezius muscle squeeze, a stimulus equivalent to skin incision, was 38·9 mg/L (3·3). Remarkably, 43 of the 49 inmates had blood thiopental concentrations below this level. Most worryingly, 21 inmates had concentrations less than the Cp50 for repression of movement in response to a vocal command. In view of these data, we suggest that it is possible that some of these inmates were fully aware during their executions. We certainly cannot conclude that these inmates were unconscious and insensate. However, with no monitoring and with use of the paralytic agent, any suffering of the inmate would be undetectable.

With little public dialogue about protocols for killing human beings, it is pertinent to consider recommendations from animal euthanasia protocols. The American Veterinary Medical Association (AVMA) panel on euthanasia specifically prohibits the use of pentobarbital with a neuromuscular blocking agent to kill animals,[8] and 19 states, including Texas, have expressly or implicitly prohibited the use of neuromuscular blocking agents in animal euthanasia because of the risk of unrecognised consciousness.[2] Furthermore, AVMA specifies that "it is of utmost importance that personnel performing this technique are trained and knowledgeable in anaesthetic techniques, and are competent in assessing anaesthetic depth appropriate for administration of potassium chloride intravenously. Administration of potassium chloride intravenously requires animals to be in a surgical plane of anesthesia characterized by loss of consciousness, loss of reflex muscle response, and loss of response to noxious stimuli".[8] The absence of training and monitoring, and the remote administration of drugs, coupled with eyewitness reports of muscle responses during execution, suggest that the current practice of lethal injection for execution fails to meet veterinary standards.[3]

Our data suggest that anaesthesia methods in lethal injection in the USA are flawed. Failures in protocol design, implementation, monitoring and review might have led to the unnecessary suffering of at least some of those executed. Because participation of doctors in protocol design or execution is ethically prohibited, adequate anaesthesia cannot be certain. Therefore, to prevent unnecessary cruelty and suffering, cessation and public review of lethal injections is warranted.

Contributors

L G Koniaris and J P Sheldon conceived the study. J P Sheldon collected the protocol information. J P Sheldon and T A Zimmers collected the toxicology data. D A Lubarsky, L G Koniaris, and T A Zimmers assessed the protocol information and toxicology data. All authors participated in the writing and editing of the manuscript. L G Koniaris and T A Zimmers contributed equally to the work.

Conflict of interest statement

JS is an attorney who represents inmates sentenced to death. None of the other authors has a conflict of interest.

Acknowledgments

There was no special source of funding for this study.

References

1 Death Penalty Information Center. http://www.deathpenaltyinfo.org/executions.php (accessed March 17, 2005).

2 Beardslee *vs* Woodford. 395 F.3d 1064, 1070 & n.8 (9th Cir 2005).

3 Denno D. When legislatures delegate death: the troubling paradox behind state uses of electrocution and lethal injection and what it says about us. *Ohio St Law J* 2002; 63: 63–261.

4 Virginia Department of Corrections Senior Warden Charlie Davis; Testimony in Reid *vs* Johnson, Civil Action No 3:03cv1039 (Sept 1, 2004).

5 Khan A, Leventhal RM. Medical aspects of capital punishment executions. *J Forensic Sci* 2002; 47: 847–51.

6 Martens-Lobenhoffer J. Stability of thiopental and pentobarbital in human plasma determined with a new easy and specific gas chromatography-mass spectrometry assay. *Pharmazie* 1999; 54: 597–99.

7 Hung OR, Varvel JR, Shafer SL, Stanski DR. Thiopental pharmacodynamics. II. Quantitation of clinical and electroencephalographic depth of anesthesia. *Anesthesiology* 1992; 77: 237–44.

8 American Veterinary Medical Association Panel on Euthanasia. American Veterinary Medical Association. 2000 Report of the AVMA Panel on Euthanasia. *J Am Vet Med Assoc* 2001; 218: 669–96.

Plaintiff's Exhibit 29

to

Complaint for Declaratory Judgment and Injunctive Relief

Steven HenleyAutopsy

TENNESSEE DEPARTMENT OF HEALTH
OFFICE OF THE CHIEF MEDICAL EXAMINER

REPORT OF INVESTIGATION BY COUNTY MEDICAL EXAMINER

Davidson County Medical Examiner: Bruce Levy M.D.

State Medical Examiner: Bruce Levy M.D.

Judicial District Number: 20

District Attorney: Honorable Victor S. Johnson III

State Number: 09-19-0295

Case Number: MEC09-0201

1. Name of Decedent	2. Age	3. Race	4. Sex
Steve Morris Henley	55 Years	White	Male

5. Address
Riverbend Maxium Security Institution, 7475 Cockrill Bend Boulevard, Nashville, TN 37243

6. Date of Death	7. Type of Death	8. Investigating Agency/Complaint #:
02/04/2009 1:33 AM	In Jail/Prison/In Police Custody	

9. Place of Death
7475 Cockrill Bend Boulevard, Nashville, TN

10. Narrative Summary
The decedent is a 55 yr. old w/m that was reportedly a prisoner at the Riverbend Maximum Security Institution. The decedent was given a lethal injection according to the sentencing ordered by the State of Tennessee. Death was pronounced at 01:33 hrs. on 02/04/2009 by Dr. Thomas. Photographs were taken of the decedent inside the execution chamber for documentation purposes. The decedent was transported to the Center for Forensic Medicine for examination by the Medical Examiner. Sherrie L. Saint, Investigator

11. Jurisdiction Accepted	12. Autopsy Ordered	13. Toxicology Ordered
Yes	Yes	Yes

14. Physician Responsible for Death Certificate
Bruce P Levy, M.D.

15. Cremation Approved	16. Funeral Home
Yes	Upper Cumberland Funeral Home

17. Cause of Death
Acute thiopental, pancuronium and potassium toxicity

18. Contributory Cause of Death

19. Manner of Death
Homicide

CERTIFIED COPY
I hereby certify that this is a true and correct copy of the medical examiner's report on file at the Office of the State Medical Examiner, Nashville TN.
By VanBuren Date 3/10/10

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE STATE MEDICAL EXAMINER
Center for Forensic Medicine
850 R.S. Gass Blvd.
Nashville, Tennessee 37216-2640

CASE: MEC09-0201
County: DAVIDSON

AUTOPSY REPORT

NAME OF DECEDENT: HENLEY, STEVE MORRIS **RACE:** W **SEX:** M **AGE:** 55

HOME ADDRESS: 7475 Cockrill Bend Blvd., Nashville TN

DATE AND TIME OF DEATH: February 4, 2009 at 1:33 a.m.

DATE AND TIME OF AUTOPSY: February 4, 2009 at 9:10 a.m.

FORENSIC PATHOLOGIST: Bruce P. Levy, M.D.

COUNTY MEDICAL EXAMINER: Bruce P. Levy, M.D.

DISTRICT ATTORNEY GENERAL: Honorable Victor S. Johnson, III

PATHOLOGIC DIAGNOSES

1. Lethal injection, clinical history:

   a. Toxicology positive for thiopental and pancuronium.

      1) Blood thiopental level toxic (8310 ng/mL).
      2) Blood pancuronium level lethal (1600 ng/mL).
      3) Thiopental (1810 ng/mL) and pancuronium (22 ng/mL).
      4) Vitreous potassium not elevated (6 mmol/L).

   b. Pulmonary vascular congestion and edema (1270 grams combined lung weight).

2. Hypertensive cardiovascular disease:

   a. Cardiac hypertrophy (570 grams).
   b. Arteriolar nephrosclerosis.
   c. Aortic atherosclerosis, slight.
   d. Blood verapamil level therapeutic (70 ng/mL).

3. Urine toxicology positive for carboxy-THC (39 ng/mL):

   a. Blood toxicology negative for cannabinoids.

(Continued)

4. Cholelithiasis.

5. Benign prostatic hypertrophy.

CAUSE OF DEATH:	Acute thiopental, pancuronium and potassium toxicity
MANNER OF DEATH:	Homicide
CIRCUMSTANCES OF DEATH:	Judicial execution – Lethal injection

---

I hereby certify that I, Bruce P. Levy, M.D. have performed an autopsy on the body of Steve Morris Henley on the fourth day of February 2009 at 9:10 am in the State of Tennessee Center for Forensic Medicine. The purpose of this report is to provide a certified opinion to the County Medical Examiner and District Attorney General. The facts and findings to support these conclusions are filed with the Tennessee Department of Health. The autopsy was performed in the presence of Dr. McMaster.

EXTERNAL EXAMINATION

The body is that of a well-developed, slightly obese white male, measuring 71 inches and weighing 239-1/2 pounds, whose appearance is consistent with the reported age of 55 years. The head hair is light brown in color, measuring approximately 5 inches long. There is a mustache on the clean-shaven face. The irides are hazel/green in color and the pupils are round. The sclerae are anicteric and the conjunctivae are slightly injected without petechiae. The ears, nose and mouth are unremarkable. A slight quantity of translucent liquid is present in the mouth. Natural teeth are in fair repair with some missing teeth with healed gums.

The anterior torso is symmetric with a protuberant soft abdomen. The posterior torso is unremarkable. The upper and lower extremities are symmetric and unremarkable. External genitalia are those of a circumcised male with descended testes.

Rigor mortis is absent. Livor mortis is purple in color, posterior in distribution, and blanching. The body is warm to touch. There is drying artifact of the scrotum.

THERAPEUTIC PROCEDURES: None.

SCARS: There is a minimum of three linear scars on the dorsum of the left hand that measure between 1/4 inch and 3/4 inch long each. There is a 1/2 x 1/4 inch scar on the anterior aspect of the right forearm.

TATTOOS: None.

INJURIES:

LETHAL INJECTION: Intravenous catheters are inserted into superficial blood vessels of both antecubital fossae. They are attached with intravenous tubing to normal saline intravenous bags. There is an additional dermal puncture of the left antecubital fossa with a surrounding 1/8-inch area of subcutaneous hemorrhage.

The following items are received with the body:

There are a total of 22 syringes. There are four syringes with red colored labels stating, "sodium thiopental," that are all empty. There are two syringes with red colored labels stating, "pancuronium bromide," that are all empty. There are two syringes with red colored labels stating, "potassium chloride," that are all empty. There are three syringes with red colored labels stating, "saline," that are all empty. There are an identical set of 11 syringes with blue colored labels that contain the same indicated items, except each syringe contains 50 mL of a translucent fluid.

There are a total of 67 glass medication bottles. There are 19 bottles labeled "pentothal 500 mg,"

of which 18 are empty and 1 still contains a translucent liquid. There are 10 empty bottles labeled "potassium chloride 40 mEq." There are 20 empty bottles labeled "pancuronium bromide 10 mL." There are 18 empty bottles labeled "sterile water 20 mL."

An additional normal saline intravenous bag is received with the body.

The above injuries, having been described, will not be repeated.

INTERNAL EXAMINATION

HEAD: The scalp is unremarkable without abrasions, contusions or lacerations. The skull is intact without fracture. The meningeal coverings of the brain are intact without epidural, subdural or subarachnoid hemorrhages.

The 1530-gram brain is symmetric with an unremarkable gyral pattern. There are no visible injuries on the surface or cut section of the brain. The distribution of cranial nerves at the base of the brain is normal. The cerebral vessels are unremarkable and normally distributed. Coronal sections through the cerebral hemispheres reveal a normal distribution of gray and white matter without focal lesions. The ventricles are of normal configuration and size. Horizontal sections through the cerebellum and brain stem reveal a normal distribution of gray and white matter without focal lesions.

NECK: There are no hemorrhages into the musculature or soft tissues of the neck. The hyoid, larynx, and trachea are intact without obstructions. The tongue is unremarkable without injury. The cervical vertebrae are palpably intact.

BODY CAVITIES: All organs are in their normal anatomic locations. The pleural, pericardial, and peritoneal cavities have smooth and glistening surfaces. Typical quantities of translucent fluid are present within the body cavities.

CARDIOVASCULAR SYSTEM: The great vessels are normally distributed without thromboemboli. There are slight atherosclerotic deposits of the aorta. The coronary artery ostia are normally placed and free of significant atherosclerotic obstruction.

The 570-gram heart has a smooth, glistening, intact epicardial surface. The right dominant coronary arteries are normally distributed and free of significant atherosclerosis. The myocardium is homogeneous red-brown in color without focal lesions. The left and right ventricles are 1.5 and 0.3 cm. in thickness at the lateral walls, respectively, and symmetric. The endocardial surfaces and four cardiac valves are unremarkable. The papillary muscles and chordae tendineae are normal. The mitral and tricuspid valves measure 11.4 and 12.2 cm. in circumference, respectively.

RESPIRATORY SYSTEM: The right and left lungs weigh 730 and 540 grams, respectively. The lungs are normally lobated. The pleural surfaces are glistening and intact. The pulmonary arteries are free of thromboemboli. The bronchi are unremarkable. The parenchyma is pink/tan in color and well aerated with slight quantities of expressed frothy fluid from both lungs. There are no focal lesions or consolidations. There is vascular congestion in dependent segments.

DIGESTIVE SYSTEM AND LIVER: The esophagus is unremarkable with a sharp gastroesophageal junction. The unremarkable stomach contains approximately 250 mL of well-

chewed and partially digested food. The duodenum, small intestines, appendix, and large intestines are unremarkable.

The 2410-gram liver has a smooth, intact capsule. The parenchyma is slightly pale brown/tan in color and soft without focal lesions. The unremarkable gallbladder contains approximately 2 ml. of bile and three yellow colored multifaceted gallstones that measure a maximum of 1.0 cm in diameter. The extrahepatic bile ducts are patent and unremarkable. The pancreas is unremarkable.

RETICULOENDOTHELIAL SYSTEM: The 360 gram spleen is congested without focal lesions. There is a normal distribution of unremarkable lymph nodes. The thymus gland is involuted.

GENITOURINARY SYSTEM: The right and left kidneys weigh 220 and 230 grams, respectively. The subcapsular surfaces are smooth. The cortices are of normal thickness with sharp corticomedullary junctions. The calices, pelves, and ureters are patent and unremarkable. The unremarkable urinary bladder contains approximately 50 ml. of urine.

The testes and seminal vesicles are unremarkable. The prostate gland is slightly enlarged with faint diffuse nodularity.

ENDOCRINE SYSTEM: The pituitary, thyroid, parathyroid and adrenal glands are unremarkable.

MUSCULOSKELETAL SYSTEM: The musculoskeletal system is intact and unremarkable. There are slightly increased quantities of subcutaneous and intra-cavity adipose tissue.

TOXICOLOGY: The following specimens are submitted for possible toxicologic analysis: Blood, bile, urine and vitreous humor. A separate report will be issued.

HISTOLOGY: The following specimens are submitted for histologic examination: Hard, bronchus, lungs, liver, kidney and brain. A separate report will be issued.

SUMMARY OF CASE

This 55-year-old male was executed by lethal injection on February 4, 2009. He was pronounced deceased at 0133 hours. An autopsy was ordered.

Autopsy revealed a slightly obese male with an enlarged heart, pulmonary edema and generalized vascular congestion. There is a history of hypertension and he is reportedly prescribed verapamil. Specimens were obtained for toxicology and histology studies.

Histologic examination of the organs confirmed left ventricular hypertrophy (an enlarged heart). There were no other significant pathologic findings.

Toxicology was positive for multiple substances. Testing of femoral blood was positive for toxic levels of both thiopental (8310 ng/mL) and pancuronium (1600 ng/mL). Both of these substances were also detected in urine (thiopental 1810 ng/mL and pancuronium 22 ng/mL). The vitreous potassium level (6 mmol/L) was not elevated, indicating that injected potassium had not diffused into the orbits. Verapamil was detected in the blood at therapeutic levels (70 ng/mL) and urine (250

ng/mL). A metabolite of marijuana (carboxy-THC 39 ng/mL) was unexpectedly detected in the urine. Repeat testing confirmed the presence of the substance in the urine, which also contained the same substances that were known to be in his body at the time of death. Testing of the blood was negative for any cannabinoids. Testing of the bile was attempted, but no results could be obtained due to sample matrix problems.

In my opinion, this person died as a result of a combined toxicity from the three agents used in the lethal injection procedure (thiopental, pancuronium and potassium). The manner of death is homicide.

Electronically signed by Bruce P. Levy, M.D. on Wednesday, February 17, 2010*

Bruce P. Levy, M.D.
Chief Medical Examiner

OFFICE OF THE MEDICAL EXAMINER
FORENSIC MEDICAL

REPORT OF MICROSCOPIC EXAMINATION

Name of Deceased: HENLEY, STEVE MORRIS **MEC09-0201**

Date of Report: March 11, 2009

HEART: Sections of both ventricles are examined. There are increased quantities of epicardial fat. The myocardium of the left ventricle is hypertrophied with abundant eosinophilic cytoplasm and enlarged nuclei. There is an increase in interstitial fibrosis, primarily surrounding penetrating arterials. There are no significant ischemic or inflammatory changes. The myocardium of the right ventricle is unremarkable. The endocardial surfaces are unremarkable.

LEFT MAIN BRONCHUS: The mucosal surface consists of respiratory epithelium with focal autolysis. The submucosa and submucosal glands are unremarkable without significant inflammation. The muscle and cartilage are unremarkable.

LUNGS: Sections of both lungs are examined. The overall architecture of the lungs is unremarkable. There is slight to moderate hyperexpansion of distal pulmonary segments. The pleural surfaces are unremarkable. There is vascular congestion of the otherwise unremarkable pulmonary vessels. Bronchi are unremarkable. Alveolar walls are thin, and alveoli are free of significant inflammation. Alveoli contain variable quantities of an amorphous faintly eosinophilic material.

LIVER: The liver capsule is unremarkable. Hepatocytes contain a foamy cytoplasm with rare (less than 1%) clear cytoplasmic vacuoles. There are no significant cellular inclusions or cellular necrosis. Portal areas contain slightly increased numbers of mononuclear inflammatory cells, but are not enlarged and do not have increased fibrosis. There is vascular congestion of the otherwise unremarkable hepatic sinusoids.

KIDNEY: The overall architecture of the kidney is unremarkable. There are rare sclerotic glomeruli. Remaining glomeruli appear unremarkable without significant increased cellularity. Tubules are unremarkable. There is vascular congestion.

BRAIN: Sections of the cerebral cortex, hippocampus, cerebellum and brainstem are examined. The arachnoid membranes are unremarkable without significant hemorrhage or inflammation. There is normal layering of the cerebral cortex without ischemic, inflammatory or neoplastic changes. The overall architecture of the hippocampus is unremarkable, and there is no significant ischemic change. The overall architecture of the cerebellum is unremarkable. Purkinje and granular cell layers are present without significant ischemic change. A section through the midbrain reveals a normal distribution of white matter tracks and deep nuclei without significant ischemic, inflammatory or neoplastic changes. The substantial nigra is appropriately pigmented. The ventricular system is lined by simple epithelium and appears unremarkable.

Electronically signed by Bruce P. Levy, M.D. on Wednesday, February 17, 2010*

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391261
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:46
	Nashville, TN 37216	**Completed:**	03/14/09 09:12
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Femoral Blood		

Henley, Steve

Test(s) Ordered:

40599 - Profile-ME Comprehensive
70524 - Confirmation Barbiturates
70531 - Confirmation Benzodiazepines
71071 - Confirm Blood Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Thiopental	**POSITIVE**	8310 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		10 mcg/mL
Amphetamines	NONE DETECTED		50 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Verapamil	POSITIVE		
Verapamil	**POSITIVE**	70 ng/mL	50 ng/mL
Barbiturates	NONE DETECTED		200 ng/mL
Meprobamate	NONE DETECTED		1250 ng/mL
Methadone	NONE DETECTED		
Benzodiazepines	NONE DETECTED		25 ng/mL
Cannabinoids (Marijuana)	NONE DETECTED		1 ng/mL
Cocaine Metabolite	NONE DETECTED		10 ng/mL
Opiates	NONE DETECTED		
Meperidine	NONE DETECTED		100 ng/mL
Fentanyl Analogues	NONE DETECTED		
Propoxyphene	NONE DETECTED		100 ng/mL
Fentanyl Group	NONE DETECTED		

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by:
Date:

TRAVIS E. CURTIS, M.S.

MAR 14 2009

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391261
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:46
	Nashville, TN 37216	**Completed:**	02/08/10 09:09
		Reported:	02/08/10 09:32
Reason:	Post-mortem		
Specimen Type:	Femoral Blood		

Test(s) Ordered:

40599 - Profile-ME Comprehensive
70524 - Confirmation Barbiturates
70531 - Confirmation Benzodiazepines
71071 - Confirm Blood Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Fentanyl Group	NONE DETECTED		1 ng/mL
Pentazocine	NONE DETECTED		100 ng/mL
Phenothiazines	NONE DETECTED		1 ng/mL
Salicylate	NONE DETECTED		50 mg/L
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

Pancuronium: Analysis by LC/TOFMS - POSITIVE - 1600 ng/mL
Amended Report

I certify that the specimen identified by this accession number has been handled and analysed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date: FEB 10 2010

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391261
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:46
	Nashville, TN 37216	**Completed:**	03/14/09 09:12
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Femoral Blood		

Test(s) Ordered:

40599 - Profile-ME Comprehensive
70524 - Confirmation Barbiturates
70531 - Confirmation Benzodiazepines
71071 - Confirm Blood Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Pentazocine	NONE DETECTED		100 ng/mL
Phenothiazines	NONE DETECTED		1 ng/mL
Salicylate	NONE DETECTED		50 mg/L
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391262
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	02/05/09 13:48
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Heart Blood		

Test(s) Ordered: 49999 - Sample Received

Drug Class	Result	Quantitation	Reporting Threshold

Testing not requested or indicated.

Testing not requested or indicated.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391263
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	03/14/09 09:05
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:
40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Thiopental	**POSITIVE**	1810 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		100 ng/mL
Barbiturates	NONE DETECTED		200 ng/mL
Verapamil	POSITIVE		
Verapamil	**POSITIVE**	250 ng/mL	50 ng/mL
Benzodiazepines	NONE DETECTED		100 ng/mL
Cannabinoids (Marijuana)	**POSITIVE**		
Carboxy-THC	**POSITIVE**	39 ng/mL	5 ng/mL
Cocaine Metabolite	NONE DETECTED		50 ng/mL
Opiates	NONE DETECTED		
Phencyclidine (PCP)	NONE DETECTED		10 ng/mL
Phenothiazines	NONE DETECTED		5 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		100 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391263
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	08/12/09 13:33
		Reported:	08/13/09 13:00
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Salicylate	NONE DETECTED		1 mg/L
Sedatives/Hypnotics	NONE DETECTED		1250 ng/mL
Methadone	NONE DETECTED		

Carboxy-THC results verified by repeat analysis.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date:

----- END OF REPORT -----

AUG 2 0 2009

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy Forensic Medical 850 RS Gass Blvd Nashville, TN 37216	**Laboratory ID:**	4391263
		Collected:	02/04/09 00:00
		Received:	02/05/09 13:48
		Completed:	12/15/09 10:56
		Reported:	12/15/09 11:03
Reason:	Post-mortem		
Specimen Type:	Urine		

Henley, Steve

Test(s) Ordered:
40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Pentobarbital	NONE DETECTED		100 ng/mL
Thiopental	**POSITIVE**	1810 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		100 ng/mL
Barbiturates	NONE DETECTED		200 ng/mL
Verapamil	POSITIVE		
Verapamil	**POSITIVE**	250 ng/mL	50 ng/mL
Benzodiazepines	NONE DETECTED		100 ng/mL
Cannabinoids (Marijuana)	**POSITIVE**		
Carboxy-THC	**POSITIVE**	39 ng/mL	5 ng/mL
Cocaine Metabolite	NONE DETECTED		50 ng/mL
Opiates	NONE DETECTED		50 ng/mL
Phencyclidine (PCP)	NONE DETECTED		10 ng/mL
Phenothiazines	NONE DETECTED		5 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		100 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date: DEC 16 2009

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391263
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	12/15/09 10:56
		Reported:	12/15/09 11:03
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Miscellaneous	NONE DETECTED		0.25 ng/mL
Salicylate	NONE DETECTED		1 mg/L
Sedatives/Hypnotics	NONE DETECTED		1250 ng/mL
Methadone	NONE DETECTED		50 ng/mL

Carboxy-THC results verified by repeat analysis.
Amended Report
Pancuronium: Analysis by LC/TOF - POSITIVE - 22 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date: DEC 16 2009

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391264
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	12/15/09 10:59
		Reported:	12/15/09 11:03
Reason:	Post-mortem		
Specimen Type:	Bile		

Test(s) Ordered: 41071 - Blood Cannabinoids

Drug Class	Result	Quantitation	Reporting Threshold
Cannabinoids (Marijuana)	CANCELED		
Carboxy-THC	CANCELED		5 ng/mL
THC	CANCELED		1 ng/mL

Unable to obtain acceptable results for THC confirmation due to sample matrix problems.

Amended Report

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date: DEC 16 2009

----- END OF REPORT -----

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391264
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	02/05/09 13:49
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Bile		

Test(s) Ordered: 49999 - Sample Received

Drug Class	Result	Quantitation	Reporting Threshold

Testing not requested or indicated.

Testing not requested or indicated.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date:

----- END OF REPORT -----

MAR 14 2009

AEGIS
SCIENCES CORPORATION
515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy Forensic Medical 850 RS Gass Blvd Nashville, TN 37216	**Laboratory ID:**	4391265
		Collected:	02/04/09 00:00
		Received:	02/05/09 13:48
		Completed:	02/13/09 14:22
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Vitreous		

Test(s) Ordered: 42197 - Vitreous Electrolyte Profile

Drug Class	Result	Quantitation	Reporting Threshold
Vitreous Electrolyte Profile	POSITIVE		
Glucose	POSITIVE	23 mg/dL	20 mg/dL
Blood Urea Nitrogen(BUN)	POSITIVE	7 mg/dL	1 mg/dL
Sodium(Na)	POSITIVE	146 mmol/L	1 mmol/L
Potassium(K)	POSITIVE	6 mmol/L	1 mmol/L
Chloride(Cl)	POSITIVE	120 mmol/L	1 mmol/L
Carbon Dioxide(CO2)	POSITIVE	13 mmol/L	1 mmol/L
Creatinine	POSITIVE	1.1 mg/dL	0.1 mg/dL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

----- END OF REPORT -----

Plaintiff's Exhibit 30

to

Complaint for Declaratory Judgment and Injunctive Relief

Stacy Rector Affidavit

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

EDWARD JEROME HARBISON,	§	
	§	
Plaintiff,	§	
	§	**No. 3:06-cv-01206**
v.	§	**Judge Trauger**
	§	
GAYLE RAY, *et al*,	§	
	§	
Defendants.	§	

AFFIDAVIT OF STACY RECTOR

Comes now the affiant, Stacy Rector, and declares under the penalty of perjury as follows:

1. My name is Stacy Rector. I live and work in Nashville, Tennessee.
2. I am the Executive Director of Tennesseans for Alternatives to the Death Penalty.
3. On February 4, 2009, I attended the execution of Steven Morris Henley.
4. After Warden Bell instructed the execution to proceed, Mr. Henley stated that he could feel it coming and started snoring loudly.
5. I closed my eyes to recite the Lord's Prayer. I opened my eyes and Steve had turned blue. I closed my eyes again.
6. Steve's sister grabbed me after a few minutes and told me he was purple.
7. I have reviewed the newspaper article by Kate Howard published on February 8, 2009, in the Tennessean newspaper, (Rector Exhibit 1), and the article by Clint

Brewer and Amy Griffith Graydon in the City Paper newspaper published on February 4, 2009, (Rector Exhibit 2).

8. Both newspaper accounts accurately report the events of Mr. Henley's execution, including the change of color in Mr. Henley's face.

FURTHER AFFIANT SAITH NOT.

Stacy Rector
STACY RECTOR

STATE OF TENNESSEE)

COUNTY OF DAVIDSON)

Sworn to and subscribed before me this 5th day of April, 2010, by Stacy Rector, who provided personal identification or is personally known to me.

B Vlan Lee
Notary Public

My Commission Expires: 5/6/13

BRADLEY A. MACLEAN
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY, TENN.
My Commission Expires MAY 6, 2013

Exhibit 1 to Stacy Rector's Affidavit

Watching Steve Henley's execution tears at reporter's heart

The Tennessean - Nashville, Tenn.
Author: KATE HOWARD
Date: Feb 8, 2009
Start Page: n/a
Section: OPINION
Text Word Count: 1241

Document Text

Commentary

Editor's note: The Tennessean's Kate Howard, who is the newspaper's public safety reporter, covered the execution of convicted murderer Steve Henley last Wednesday morning. This is her account of covering the imposed sentence. Mark Silverman's column will return.

This morning I watched as lethal drugs flowed into the veins of a man.

Steve Henley was a murderer, or at least that's what the courts decided when they convicted him of shooting an elderly farm couple and burning down the house with their bodies inside. He lived under a death sentence for 23 years.

"I'm an innocent man."

It was the last thing he said before the warden said "Proceed," and sent him to death with just two powerful syllables.

I had spent the earlier hours at a variety of places: at a prayer vigil for Steve, where resistance songs were played and mourners bemoaned state killing at what felt like a funeral six hours premature. I stood in the 18-degree weather with a handful of early protesters, one of whom spent 20 years on death row himself before new technology made him a free man. He was opposed to any type of killing whether Steve was guilty or innocent, he said. I stood in the well-heated press tent with reporters who gave me pitying looks when they learned I was a witness, and the quiet ones who would be going in with me.

I spent an hour, an extremely awkward hour, getting shuffled with Steve's family from one concrete, clockless conference room to another while they counted down the minutes. The warden of Riverbend Maximum Security Institution had brought us into the room himself and let us know right off the bat there were no interviews on these premises. There were six of us intruding on those sacred moments, media witnesses who were told to stay silent.

But we listened while they talked about their father's fast car, the Chevelle that's since been sold that his son would give anything to drive again. His father could shift so fast, Greg Henley said, that he'd tape a $100 bill to the dashboard and offer it to you - if you could lean forward far enough to get it once he stepped on the gas. They talked about his innocence, how they couldn't believe the state was killing a good, innocent man.

We scribbled as quietly as we could with the provided pencils and notebooks, trying to record the moment as the family bowed their heads, held hands and prayed one last time for Steve.

Son says he forgives the state

His pastor, a staunch anti-death penalty advocate, said she couldn't believe this was really happening after all these years. His son Greg, who said he didn't comprehend reading that well, was repeating over and over the statement he planned to give later to the press, trying to commit it to memory.

"I forgive the state of Tennessee for executing my daddy. I forgive the state of Tennessee for executing my loving daddy. I forgive the state of Tennessee for executing my loving daddy, and I want you to know he is an innocent man."

Later, as we rounded an hour of silence on our side of the room, the press witnesses were confronted with a well-meaning question from Greg.

"Can I ask you a question? Are you guys ... are you pro-death penalty, or anti, I guess?"

Another reporter lifted his head and said the warden told us not to talk to them. Greg apologized.

His sister said that they'd know how we felt once they watched our reports and gave me in particular a knowing nod.

With that, the stony-faced guard at the door nodded to us that it was time. We walked single file through the visiting room - there was a play castle, dolls and children's toys in the corner - to a small concrete room. A row of squeaky

chairs faced a window. The blinds were drawn. Behind it was Steve, or Henley to those of us in the back.

We sat that way for 12 minutes, with the noises of preparation and shadows of prison officials leaking through. The microphone turned on. Greg stopped rocking back and forth. Steve's daughter asked for a bucket.

The blinds were lifted, and Henley was strapped to the gurney. A microphone was coming down from the ceiling for his last statement. He raised his head, turned to see his family, and stuck out his tongue. With his hands strapped down, he tried to blow a kiss. He made his statement. He said he was sorry for what Fred and Edna went through, but he didn't do it. He said he hoped this procedure would give some peace to them and their family, although he didn't believe death brought anything but pain. He said he was an innocent man.

Proceed.

His family began to sob. They stood by the window, shouted to him. He told them to quit crying, called them a pitiful bunch. He told them - perhaps his pastor especially - to never quit.

"I feel it coming," he shouted from the death chamber.

His head was already down, he snored a few times and went silent. In the witness chamber, it was chaos.

They were screaming, sobbing. His daughter began to throw up. His sister and his pastor joined together in the Lord's Prayer, so impassioned that even the pastor stumbled over the words.

I bit my lip and furiously wrote, knowing my notes were never going to match my memory or capture what was happening in that moment. The color drained from his face. He started to turn blue. And slowly it grew quiet in the witness chamber, too.

Don't cry. Don't cry.

I looked at the other reporters. They were still writing.

Soon Henley's sister turned and stared me and the others straight in the face.

"Not a tear in anyone's eye back there," she said to nobody in particular. "Don't human life mean nothing to you? You're like a pack of dogs."

Yesterday, throughout the day most of my colleagues asked me how I felt about covering this execution, watching a man die. I kept saying I wasn't sure yet. A few told me about other reporters they've known who covered them. Some were vague about the impact. Others told me I'd be traumatized.

Before it was time, I had called my boyfriend and asked him, what if I got emotional? What if I cried in front of the other reporters? He told me I would be professional and I would be real. If I cried, then I was being real about it. After all, I was watching a man die.

In truth, it probably was the only time I did successfully hold back tears. I have always been emotional, and always, during a good interview, find myself feeling my subject's emotions. It would be a lie to say I don't often wipe away a tear when interviewing people who have lost someone to murder or illness or ruthless tornadoes.

But on those days I never watched it happen. I have always come along in the aftermath, and felt the hot tears coming when I've heard about grief setting in.

This morning I watched it happen, a true rarity in the world of reporting on crime.

And today, who knows why, the tears held until I got home.

Contact Kate Howard at 615-726-8968 or kahoward@tennessean.com

Abstract (Document Summary)

The Tennessean's Kate Howard, who is the newspaper's public safety reporter, covered the execution of convicted murderer Steve Henley last Wednesday morning. Son says he forgives the state His pastor, a staunch anti-death penalty advocate, said she couldn't believe this was really happening after all these years.

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Exhibit 2 to Stacy Rector's Affidavit

The City Paper

Published on *Nashville City Paper: Nashville's Online Source for Daily News* (http://nashvillecitypaper.com)

Henley executed, maintains innocence in final words

By *southcomm*
Created *02/19/2009 - 8:53pm*

Clint Brewer & Amy Griffith Graydon

$element(flashss,slideshow,147,Nasc)$

Convicted murderer Steve Henley met his death at the hands of the state with a smile on his face and maintained his innocence even in his final moments amid the cries and prayers of his family.

"As I have said ever since this happened, I didn't kill them," Henley said during his final words of his victims, Fred and Edna Stafford. "I hope they can rest easier after this procedure is done."

Henley was pronounced dead at 1:33 a.m. today in the Riverbend Maximum Security Institute's death chamber. Henley was put to death using Tennessee' controversial three-drug protocol for lethal injection, an execution method Henley's attorneys argued was unconstitutional in last minute briefs to the U.S. Supreme Court as late as yesterday evening just hours before the appointed execution date and time.

Henley was revealed to family members and media witnesses to the execution at 1:17 a.m., already strapped to the death gurney. When he heard the shouts and cries of his family, Henley lifted his head and smiled to them.

In his final words, Henley more than once maintained his innocence in the 1985 murder of the Staffords. Henley also questioned whether his death would bring any peace to the Stafford family, noting his own family's apparent grief.

"I would like to say I hope this gives Fred and Edna's family some peace," Henley said. "In my experience in life, it won't. The death of a family member never brings anything but pain."

"I'm an innocent man," Henley added later.

From the death gurney, Henley also gently admonished his children and sister for their tears.

"Bye," Henley said, making kissing motions with his mouth to his family. "Stop that crying. Stop it. I'll see you on the other side. Ya'll are a pitiful bunch." The final comment drew laughter not only from his family but also from Henley.

In an emotionally charged death chamber with his distraught son, daughter and sister watching, Henley's execution began with the command of "proceed" from Warden Rickey Bell at 1:19 a.m.

"I feel it coming on," Henley said, and then went motionless and made noises as if he were snoring.

The death chamber then exploded in a torrent of emotions from Henley's family. Henley's grown son, Greg Henley, wept openly. His daughter, Leanne Henley, screamed, "Oh my God, no, no," as Henley began to slip away.

At one point, the entire Henley family along with their spiritual advisor Stacey Rector began saying the Lord's Prayer in unison, their voices growing louder and louder in the death chamber as the familiar prayer advanced.

At about 1:26 a.m., Henley's face began to turn blue while still strapped to the gurney. His face eventually turned purple as family members watched.

"They killed my brother for nothing!" explained an angry Stephanie Worley, Henley's sister. Worley eventually turned her anger on members of the press sitting in the death chamber as witnesses.

"I don't see a tear back here," Worley said, as she turned to face reporters. "I guess human life has no meaning anymore. Like a bunch of dogs."

It was unclear from the witness vantage point when during the almost 30 minute process Henley was given the three different drugs – one to act as an anesthetic, another to stop his breathing and a third to stop his heart.

Henley was pronounced dead 14 minutes after the execution began with the command from the warden.

"The state of Tennessee just killed an innocent man," George Henley said in the death chamber after his father had passed. "I forgive them, but two wrongs don't make a right. I hope they know that."

Henley was convicted and executed for the grisly murders in Jackson County of the Staffords in 1985. The couple was shot by Henley in a dispute over money and then placed inside their house, which he then set on fire. Edna Stafford, though shot twice, was still alive and died from injuries suffered in the blaze.

Tennessee Department of Corrections staff said a nephew of the Staffords, Jack Stafford, witnessed the execution from another room.

Henley has maintained his innocence for over two decades, saying it was the man that testified against him who actually committed the murders.

Henley was the fifth person to be executed in Tennessee since 1960 and the fourth by lethal injection. Presently, Tennessee' lethal injection protocol is the subject of a legal battle in the 6th Circuit Court of Appeals where condemned inmate Edward Harbison is trying to see an opinion from district court upheld that states Tennessee's lethal injection method constitutes cruel and unusual punishment.

Greg Henley spoke emotionally to members of the media after the execution. He and his sister, Leanne, stood arm-in-arm, appearing to hold back sobs. Greg Henley's voice broke as he maintained his father's innocence.

"I forgive the state of Tennessee for executing our loving Daddy. I want them to know I'm praying for both our side of the family, and Fred and Edna Stafford's family," Greg Henley said. "But I also want you to know, you executed an innocent man, an innocent man."

Rector said Henley was "at peace." As prospects of legally staying the execution grew bleaker as the day progressed, Rector said Henley accepted the developments and was "ready," though he maintained concerns for his family and for the Staffords' family.

"I very much believe he ministered to me far more than I ministered to him tonight," Rector told reporters. "I think what he hopes most is that story will be told now, even if he's not here, because he very much feels that it should be."

Last-minute appeals on Henley's behalf were denied, said Henley's attorney, Paul Davidson of Waller Lansden Dortch & Davis. A request made to Gov. Phil Bredesen for a 30-day reprieve was also denied. The 30-day reprieve was requested to allow for presentation of a clemency petition.

"Unfortunately, the governor made the decision not to give him that opportunity, and that ended [Hensley's] appeals tonight," Davidson said.

Near the prison, more than 60 demonstrators gathered to show their opposition to the death penalty, a turnout that surprised Tennessee Coalition Against State Killings (TCASK) field organizer Isaac Kimes. Temperatures in Nashville hovered around 15 degrees early Wednesday morning, and a light snow fell during parts of the evening. Due to the weather and to the midnight start of the demonstration, Kimes said he was very pleased with the number of people participating.

Volunteers at the event said they wouldn't be anywhere else. Some held signs, or Bibles. While TCASK is a secular organization, Kimes said the anti-death penalty movement draws a number of volunteers who oppose execution on religious grounds.

"I believe that my faith calls me to be here, and to speak out against something I don't believe in. I believe that God is love, and God is forgiveness as well," said demonstrator Menzo Faassen.

"From a religious standpoint, I don't think that anyone has the right to take another person's life, in any form or fashion. The fact that the state of Tennessee, of which I'm a citizen, is pre-meditatively taking another person's life is just incomprehensible to me. I need to be out here to stand against that," said TCASK volunteer Harry Simpson. "Tennesseans are better than this. ... I don't know why more people aren't out here."

For those at the vigil, the presence of Michael McCormick – a Tennessee man who spent 17 years on death row before being acquitted and released in 2007 – served as testimony to a legal system that sometimes makes mistakes.

"I'm here to support Steve. I'm here to support all of [those on death row]. I knew them for 20 years," McCormick said. "The system can fail. People can be executed for crimes they didn't commit. People need to keep that in mind."

City News

Plaintiff's Exhibit 31

to

Complaint for Declaratory Judgment and Injunctive Relief

***Thiopental Pharmacodynamics* article**

Anesthesiology
77:237–244, 1992

Thiopental Pharmacodynamics

II. Quantitation of Clinical and Electroencephalographic Depth of Anesthesia

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This study examined the relationship among pseudo–steady-state (constant) serum thiopental concentrations, clinical anesthetic depth as assessed by several perioperative stimuli, and the electroencephalogram (EEG). Twenty-six ASA physical status 1 or 2 patients participated in the study. Two constant serum thiopental concentrations were maintained in each patient using a computer-controlled infusion pump. The first randomly assigned target serum concentration of 10–30 μg/ml was maintained for 5 min to allow serum:brain equilibration. Then the following stimuli were applied at 1-min intervals: verbal command, tetanic nerve stimulation, trapezius muscle squeeze, and laryngoscopy. A second, higher, randomly assigned target serum concentration of 40–90 μg/ml was then achieved and maintained by the computer-controlled infusion pump. The previously described stimuli were reapplied, after which laryngoscopy and intubation was performed. A positive response was recorded if purposeful extremity movement or coughing was observed. Using the quantal movement or cough response and the measured constant serum thiopental concentration, the probability of no movement to each stimulus was characterized using logistic regression. The serum thiopental concentrations that produced a 50% probability of no movement response for the clinical stimuli were as follows: 15.6 μg/ml for verbal command, 30.3 μg/ml for tetanic nerve stimulation, 39.8 μg/ml for trapezius muscle squeeze, 50.7 μg/ml for laryngoscopy, and 78.8 μg/ml for laryngoscopy followed by intubation. The EEG was analyzed using aperiodic waveform analysis to derive the number of waves per second. A biphasic relationship between constant serum thiopental concentration and the EEG number of waves per second was observed. Loss of responsiveness to verbal stimulation occurred when the EEG was activated at 15–18 waves/s. Marked EEG slowing and isoelectric EEG (1–3 waves/s) associated with high serum thiopental concentrations (> 50 μg/ml) were necessary to prevent movement response to profound noxious stimuli such as laryngoscopy and intubation. The biphasic thiopental concentration–EEG relationship and the isoelectric EEG at the high serum thiopental concentrations needed to prevent purposeful movement responses limit the utility of the EEG as a measure of anesthetic depth when thiopental is used alone. This study demonstrates a conceptual approach to quantitate the serum thiopental concentration *versus* clinical and EEG depth of anesthesia. (Key words: Anesthetic depth: thiopental. Anesthetics, intravenous: thiopental. Brain: electroencephalography. Pharmacodynamics: aperiodic waveform analysis; electroencephalography; thiopental.)

OVER THE PAST 30 yr the assessment of depth of anesthesia has been a constantly evolving topic, with the introduction of newer drugs with more specific pharmacologic actions.[1] In a recent editorial, Prys-Roberts reexamined this issue and stated that depth of anesthesia is difficult to define because anesthetists have approached the issue in terms of the drugs available to them rather than the patient's needs during surgery.[2] He believes that the noxious stimulations of anesthesia and surgery induce a variety of reflex responses that may be independently modified by anesthetic drugs to the benefit of the patient. Prys-Roberts focused his concept on the body's response to noxious stimuli that can be ablated and attenuated by specific anesthetic drugs.

Inhalational anesthetic depth has been classically characterized by the minimum alveolar concentration (MAC) concept as developed by Eger and associates.[3] The measurement of MAC has several important elements, including 1) a constant partial pressure of volatile anesthetic at the site of action before measurement of response, 2) the application of a specific, noxious stimuli (initial skin incision in humans, tail clamping in animals), and 3) requirement for observation of a defined clinical response, usually purposeful movement. Our understanding of the pharmacology of inhalational anesthetics has been significantly enhanced with the determination of MAC.[4]

Unfortunately, similar unifying methodology or concepts to assess drug concentration *versus* depth of anesthesia have not evolved for the intravenous (iv) anesthetics such as thiopental, methohexital, or propofol. The traditional clinical use of intermittent, bolus iv administration of these drugs results in rapidly changing drug concentrations that preclude constant concentrations in the serum and at the site of action (biophase) during the application of clinical stimuli. We have demonstrated that a computer-controlled infusion pump (CCIP) can be used to attain rapidly and then maintain pseudo–steady-state (constant) serum thiopental concentrations.[5] These constant serum concentrations result in a constant intensity

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of drug effect as measured with the electroencephalogram (EEG) using the number of waves per second obtained from aperiodic waveform analysis.

The objectives of this study were 1) to determine the relationship of a constant serum thiopental concentration and the clinical anesthetic depth as assessed by several relevant clinical noxious stimuli and the purposeful movement response and 2) to correlate the thiopental EEG drug effect as measured by the number of waves per second derived from aperiodic waveform analysis with the clinical depth of anesthesia.

Materials and Methods

After obtaining institutional approval and individual informed consent, 26 healthy ASA physical status 1 or 2 male surgical patients participated in the study. All of the patients were free of cardiovascular, respiratory, neurologic, renal, or hepatic diseases by routine preoperative history, physical examination, and laboratory evaluation. Patients who were concurrently taking medications that would affect the central nervous system and/or the cardiovascular system were excluded. Their age range was 30–79 yr (mean ± SD 45.5 ± 11 yr). The weight range was 64–118 kg (mean ± SD 87 ± 14.8 kg). None of the patients received preoperative medication.

After an overnight fast, the subjects were brought to the operating room. An iv catheter was placed for drug and fluid administration. An arterial catheter was placed in the radial artery for continuous hemodynamic monitoring and blood sampling. A four-channel bipolar EEG was continuously recorded from leads C3-P3, C4-P4, Cz-P3, and Cz-P4 during the study, according to the International 10/20 system of electrode placement. EEG recording parameters and equipment were identical to our previous description.[5] The CCIP consisted of a Toshiba® T-3100 laptop computer and a Harvard® 22 Infusion Pump (Harvard Apparatus®, South Natick, MA). The thiopental pharmacokinetic data used in the CCIP has previously been described and its predictive performance quantitated.[5] The STANPUMP computer program was used in the CCIP.[6]

Figure 1 displays the sequence of the study events. A 5-min baseline recording of the EEG was obtained with the patient's eyes closed and with the patient breathing 100% oxygen through the anesthetic circuit and face mask. The CCIP then rapidly achieved and maintained the first target thiopental concentration randomly assigned between 10 and 30 μg/ml. After maintaining this target concentration for 5 min to allow serum:brain equilibration of thiopental, the patient was tested for verbal responsiveness. If the patient was still verbally responsive for an additional 2 min, the thiopental target concentration was increased to the second target level. If

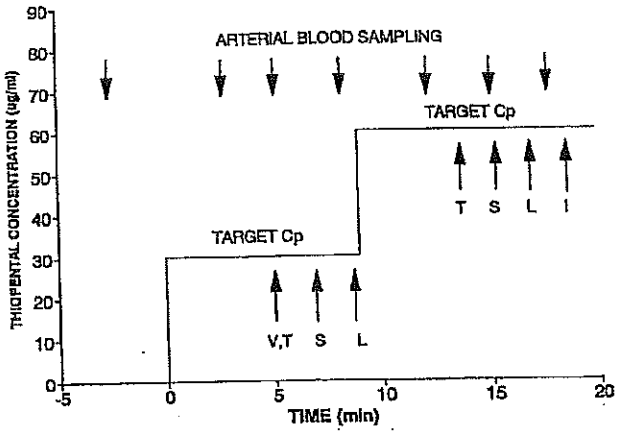

FIG. 1. The study design. Two target serum thiopental concentrations were achieved. Arterial blood sampling was obtained to measure blood gases and serum thiopental concentrations. Stimuli were applied as indicated. V = verbal stimuli; T = tetanic nerve stimulation; S = trapezius muscle squeeze; L = laryngoscopy; I = laryngoscopy and intubation.

the patient was unresponsive to verbal command, several noxious stimuli of 10-s duration were applied at 1-min intervals. These consisted of a 50-Hz constant electrical current that generated 50 mA to the forearm using a peripheral nerve stimulator to create neuromuscular tetanus (tetanic nerve stimulation), trapezius muscle squeeze, and direct laryngoscopy without intubation. Following these stimuli, a second, higher target serum thiopental concentration randomly assigned between 40 and 90 μg/ml was then rapidly achieved with the CCIP and maintained for 5 min. The same three noxious stimuli were repeated at 1-min intervals, followed by a laryngoscopy and intubation.

For the tetanic nerve stimulation and trapezius muscle squeeze, purposeful movement of an extremity was considered a positive response. For the laryngoscopy and laryngoscopy followed by intubation stimuli, in addition to purposeful movement of an extremity, any coughing or bucking during or immediately after the stimuli was considered a positive movement response. No other anesthetic drugs or muscle relaxants were used during the study. Ventilation was assisted as needed with a face mask and anesthesia circuit. Frequent arterial blood samples were collected prior to and during the study for measurement of serum thiopental concentrations and arterial blood gases (fig. 1).

The total (free plus bound) serum thiopental concentration were determined by a previously reported high-performance liquid chromatography assay.[7] For each target serum thiopental concentration, the mean of the two measured values (termed the constant serum thiopental concentration) obtained at least 5 min after achieving the

target was used in the subsequent pharmacodynamic analysis. The performance error of the CCIP was evaluated by calculating the median performance error (a measure of the systematic over or under achievement [bias] of the target level) and median absolute performance error, as described previously.[5,6] The median absolute performance error is a measure of the inaccuracy of the CCIP such that half of the performance errors will be greater than and half less than the median absolute performance error. A total of 111 measured serum thiopental concentrations were used in this data analysis.

The number of waves per second was derived from the EEG using the aperiodic waveform analysis methodology previously described.[5] The number of waves per second was smoothed using a moving average over a 10-s window. Using the constant serum thiopental concentrations and the quantal move/no move responses, the probability of no movement to each stimulus was modeled with the following expression:

$$\text{Probability of no movement} = \frac{Cp^{\gamma}}{Cp^{\gamma} + Cp_{50}^{\gamma}}$$

where Cp = measured constant serum thiopental concentration; Cp_{50} = constant serum thiopental concentration that will produce 50% probability of no movement to the noxious stimulus, and γ is the power function that describes the steepness of slope of the concentration *versus* effect relationship.

The Cp_{50} (± SE) for the movement responses to the stimuli were estimated with logistic regression.¶ The 95% confidence bounds were also estimated to determine if the responses to the stimuli were statistically different.

Results

No major complications occurred during the studies. Noxious stimuli were not applied to five patients at the first target serum concentration because they were arousable and responded to verbal commands. Due to difficulty visualizing the larynx secondary to the absence of muscle relaxants, the tracheas of six subjects could not be intubated. The arterial blood gases of all of the patients during the study were within normal limits, with mean (± SD) *p*H 7.39 (± 0.03), P_{CO_2} 42 (± 5.3), P_{O_2} 398 (± 140), and HCO_3 25.2 (± 2.2). When interviewed 24 h postoperatively, none of the subjects could recall the events that occurred during the study .

The measured, constant serum thiopental concentration *versus* time profiles for all of the patients at the two different target levels are shown in figure 2. Although

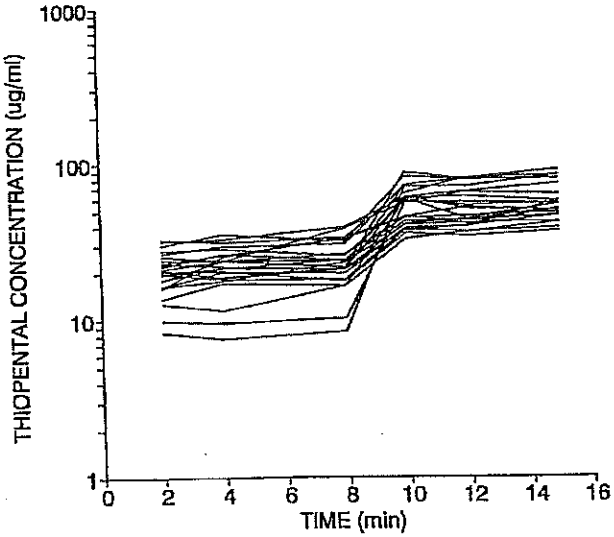

FIG. 2. The measured serum thiopental concentrations *versus* time for the two target thiopental concentrations in the 26 subjects.

there were slight variations of measured values at each target concentration during the study, the overall ability of the CCIP to achieve and maintain constant thiopental serum concentrations was satisfactory. The median absolute performance error, a measure of variability of the CCIP, was 18.5%, and the median performance error, a measure of bias, was +14%.

The relationship between the movement response and constant serum thiopental concentrations is shown in figure 3. For the five different stimuli, a pattern of consistent movement response at low constant serum thiopental concentrations was followed by an intermediate region at higher serum concentrations where both movement and no movement occurred followed by consistent lack of movement response at the highest serum concentrations. A rank order of progressively more intense stimuli can be seen in figure 3 from verbal to intubation stimulus. With the intubation stimulus, only three patients did not move despite constant serum thiopental concentrations approaching 90 μg/ml. Figure 4 displays the logistic regression analysis of the raw data. There is a family of curves that represent the probability of no movement relative to constant serum thiopental concentration. Table 1 presents the Cp_{50}, or constant serum thiopental concentration that produces a 50% probability of no response. Figure 4 displays the Cp_{50} values and the 95% confidence bounds of the estimate. The 95% confidence bounds of tetanic nerve stimulation and trapezius muscle squeeze overlap, indicating that the likelihood of movement in response to these two stimuli were not statistically different. The likelihood of movement in response to trapezius muscle squeeze were not statistically different from la-

¶ Wilkinson L: SYSTAT: The system for statistics. Evanston, IL, SYSTAT, Inc., 1988.

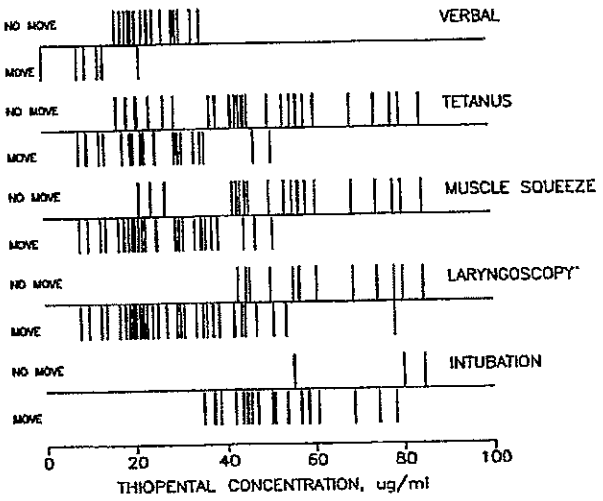

FIG. 3. The move/no move *versus* serum thiopental concentration for the five different clinical stimuli. Each bar indicates the serum thiopental concentration and response for stimuli applied to an individual patient.

ryngoscopy. The remaining stimuli were statistically different.

After visual inspection of all of the EEG recordings, the Cz-P3 lead appeared to be least affected by muscular movement and electromyographic interference during the study. This lead was used for subsequent analysis in all subjects. The biphasic relationship of the number of waves per second *versus* constant serum thiopental concentrations is shown in figure 5. At low concentrations of thiopental (15–20 μg/ml) there was an initial activation of the EEG, with an increase in the number of waves per second from the baseline. This was followed by a progressive decrease in the number of waves per second (*i.e.*, EEG slowing) with progressively higher serum thiopental concentrations. The EEG became isoelectric at serum thiopental concentrations greater than 50 μg/ml. Figure 6 displays the number of waves per second immediately before and after application of the noxious stimuli. There was no evidence of EEG activation when the stimuli were applied, even though the patients responded with clinical signs of inadequate anesthesia (movement).

The relationship of the number of waves per second to the presence or absence of the movement response from different stimuli is shown on figure 7. For the verbal, tetanic nerve stimulation and trapezius muscle squeeze, the biphasic relationship of constant serum thiopental concentration to the EEG number of waves per second confounded the data interpretation. Any EEG value greater than 8.5 waves/s (the awake baseline) can be associated with two different serum thiopental concentrations, a lower serum concentration during the EEG activation and then a higher serum concentration as the ac-

TABLE 1. Cp_{50} Values for Different Stimuli

Stimulus	Cp_{50} ± SE (μg/ml)	95% Confidence Limits (μg/ml)
Verbal	15.6 ± 1.1	13.4–18
Tetanus	30.3 ± 3.8	22.5–38
Trapezius squeeze	39.8 ± 3.3	33.1–46.4
Laryngoscopy	50.7 ± 2.9	44.8–56.5
Intubation	78.8 ± 7.4	63.4–92.4

Cp_{50} = constant serum thiopental concentration that produces a 50% probability of no movement response.

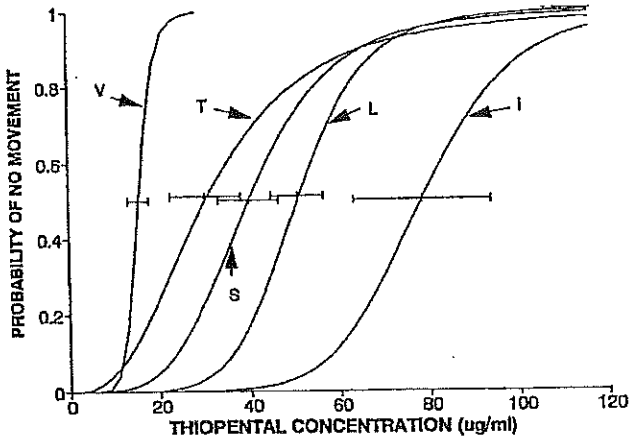

FIG. 4. The predicted probability of no movement *versus* serum thiopental concentrations, obtained using logistic regression of the data indicated in figure 3. The bars indicate the 95% confidence bounds of the estimate of the serum thiopental concentration producing a 50% probability of no movement response. V = verbal; T = tetanic nerve stimulation; S = trapezius muscle squeeze; L = laryngoscopy; I = laryngoscopy and intubation.

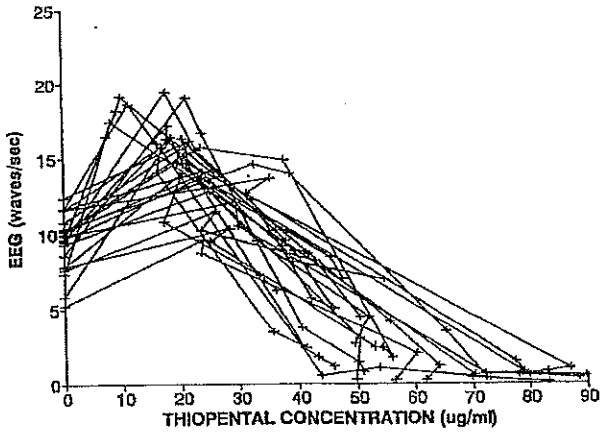

FIG. 5. The EEG waves per second *versus* measured constant serum thiopental concentration in the 26 subjects.

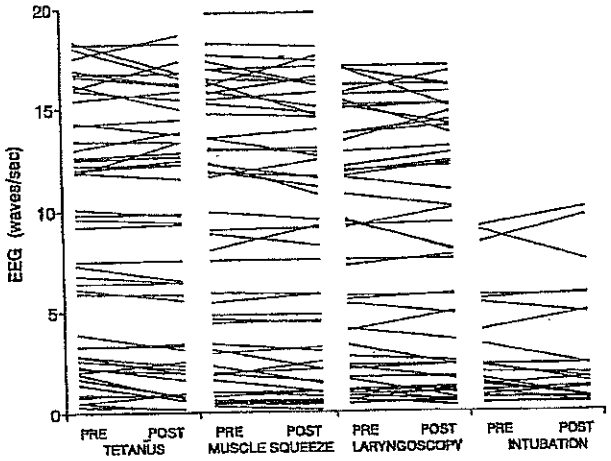

FIG. 6. The EEG waves per second pre- and postnoxious stimuli. No consistent trend of EEG activation or increasing waves per second could be seen with the different stimuli.

tivated EEG begins to slow. Thus, for the three less noxious stimuli (verbal, tetanic nerve stimulation, trapezius muscle squeeze) associated with lower serum thiopental concentrations, it was not possible to define a unique relationship between the number of waves per second and the presence or absence of movement. For laryngoscopy and laryngoscopy followed by intubation, movement responses occurred at low values of the EEG number of waves (0–3 waves/s) that are associated with a near isoelectric EEG.

Discussion

The assessment of clinical depth of anesthesia involves observing the responsiveness of a patient to a defined stimuli at a known and constant anesthetic drug concentration.[4] This approach has been best understood and applied to the inhalational anesthetics using the MAC methodology developed by Eger and associates over the past 25 yr.[3] The end-tidal, alveolar concentration was used as the site for measurement of drug concentration because it is the most readily measured index of equilibrium brain anesthetic tension. The initial skin incision and observation of movement response has been used successfully in humans as a reproducible, maximal, noxious stimulus and consistent response. Other stimuli and responses, more or less intense than skin incision and movement, have been described. These include verbal stimulus for eye opening (MAC-awake),[8] intubation and movement/coughing (MAC-intubation),[9] and skin incision with suppression of catecholamine release (MAC for blocking adrenergic response to incision [MAC-BAR]).[10]

Borrowing approaches used for the assessment of potent inhalational anesthetic depth, we have developed a method that can be applied to iv anesthetics like thiopental. The traditional bolus administration of iv anesthetic drugs prevents meaningful pharmacologic quantitation.[5] The CCIP allows constant iv anesthetic serum drug concentrations to be attained rapidly and then maintained and has obviated the limitation of rapid iv bolus administration. In the current study, the CCIP had a degree of accuracy and variability in surgical patients that was similar to what we observed in healthy volunteers.[5] The presence of noxious clinical stimuli and a wider age and weight range in the current study did not diminish the ability of the CCIP to obtain constant serum thiopental concentrations. The clinical movement responses seen following the multiple noxious stimuli did not appear to alter the pharmacokinetics of thiopental.

During the laryngoscopy and laryngoscopy followed by intubation stimuli coughing or bucking was used as a positive clinical response. When patients had coughing or bucking following laryngoscopy followed by intubation, movement of the extremities also occurred. It was difficult to separate purposeful from nonpurposeful movement of the extremities during this time, so we included coughing as a positive clinical response. MAC-intubation also used coughing and purposeful movement as the clinical response.[8] The movement responses may be associated with the spinal (brain stem in the case of laryngoscopy and intubation) reflexes to peripheral noxious stimuli. However, they also may be associated with light anesthesia and inadequate cortical CNS suppression, since most of these movement responses were associated with an increase of mean arterial pressure and heart rate. It is not possible for us to separate the cortical from spinal components of a movement or cough response.

The noxious stimuli we used differ from the skin incision used during the MAC measurement for potent inhalational anesthetics. We chose five different stimuli that were clinically relevant and justifiable during the induction of anesthesia using only thiopental. Figures 3 and 4

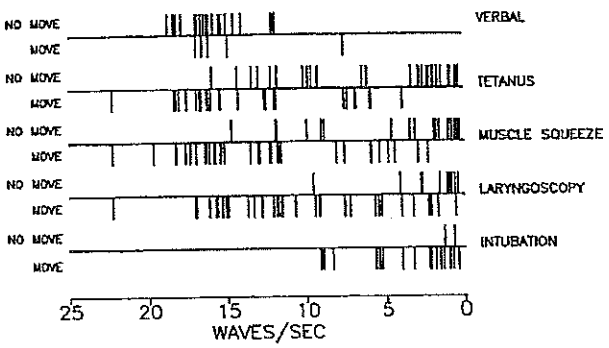

FIG. 7. The move/no move response *versus* EEG waves per second for the five different stimuli.

and table 1 demonstrate the progressive rank order of increasing constant serum thiopental concentrations necessary to create the transition from consistent movement response to no movement for the five different stimuli. The rank order of increasing drug concentration required to prevent movement response is compatible with the stimuli becoming progressively more intense. The least noxious stimulus was verbal responsiveness, with a Cp_{50} of 15.6 μg/ml, whereas the most noxious stimulus was laryngoscopy followed by intubation, with a Cp_{50} of 78.8 μg/ml. Only two pairs of stimuli were not statistically distinct; these were tetanic nerve stimulation *versus* trapezius muscle squeeze and trapezius muscle squeeze *versus* laryngoscopy. Becker has previously reported that serum thiopental concentrations that ablate the corneal reflex and responses to trapezius muscle squeeze and skin incision are essentially the same at 39–42 μg/ml.[11] We obtained a Cp_{50} value of 38.9 μg/ml for trapezius muscle squeeze, almost identical to what Becker reported.

Our data demonstrate that laryngoscopy followed by intubation is much more noxious than a laryngoscopy by itself. Yakaitis *et al.*[9] also found that significantly higher inhalational anesthetic concentrations are needed to ablate movement response to laryngoscopy followed by intubation relative to skin incision. Ausems *et al.* reported similar findings with the opiate alfentanil given with 70% nitrous oxide.[12] The significant innervation of the larynx and trachea may explain why, for three different anesthetic drugs, the intubation stimulus requires the highest anesthetic concentrations to ablate clinical response. Laryngoscopy followed by intubation can be considered the most noxious stimulus that has been quantitated with available methodology in humans. The constant serum thiopental concentrations necessary to ablate movement response to intubation are so high (greater than 80 μg/ml) that conventional induction doses of thiopental (4–5 mg/kg) do not achieve the biophase or site of action concentrations our study predicts are necessary to prevent movement. Clinical studies performed in the 1950s and repeated in the 1970s have demonstrated that hemodynamic responses to laryngoscopy and tracheal intubation are profound with conventional induction doses of thiopental (5–6 mg/kg).[13,14] Thiopental is known to be an effective hypnotic with few analgesic properties.[15] The high concentrations necessary to ablate the most noxious clinical stimulus demonstrated in our study may be a reflection of the lack of analgesia associated with thiopental hypnosis. Clinical practice has resulted in the addition of other anesthetic drugs with more analgesic efficacy (*i.e.*, opiates or inhalational anesthetics) to prevent unacceptable clinical sequela of inadequate anesthesia when thiopental is used as an induction agent.

There are some limitations of the methodology we used that could introduce error in our results. The logistic regression data analysis assumes that each measurement in a subject is independent and not correlated with any other measurements in that individual. Our study design had the following limitations relative to this assumption. 1) While two target serum thiopental concentrations were achieved in each individual, the lower concentration was always achieved before the higher value. 2) Except for intubation, each stimulus was applied twice to the same subject, resulting in possible intrasubject correlation and tolerance or sensitization. 3) Stimuli were not applied in a random manner, but rather in a sequence of least noxious stimulus progressing to the most noxious stimulus. 4) Except for verbal stimulation and tetanic nerve stimulation, the stimuli could not be standardized in an absolute manner. Even though most of the stimuli were applied by two of the investigators (SLS and DRS), it is likely that the magnitude of stimulation varied to some degree for trapezius muscle squeeze, laryngoscopy, and intubation. 5) For the intubation stimuli, only three nonresponses were recorded. Although this small amount of data was adequate for the logistic regression characterization, it would have been ideal to have higher thiopental serum concentrations and more nonresponses. We cannot assess the importance of the variation of stimuli on the pharmacodynamic data we have gathered. The tetanic nerve stimulation was performed for a precise period of time at a constant current (50 mA) and should represent a most reproducible stimulus.

Because of the concurrent perioperative use of anesthetic drugs with specific actions, such as muscle relaxants, β-blockers, and vasodilators, the traditional clinical signs of anesthetic depth such as movement and hemodynamic responses to noxious stimuli become less interpretable. This makes the monitoring of anesthetic depth more challenging to the anesthesiologist. The EEG has been suggested as a possible measure of anesthetic depth for halothane,[16] etomidate,[17] methohexitone,[18] isoflurane,[19] and propofol.[20] All of these studies have shown a relationship between the anesthetic drug concentration and various processed EEG measures that reflect the EEG response. Some of these studies have examined the clinical response to specific stimuli that may or may not be clinically relevant. However, none of the previous studies has directly attempted to correlate the EEG with clinical responses to relevant perioperative stimuli.

In the current study, we could not demonstrate a change of the EEG number of waves per second following the application of a series of noxious stimuli. In a canine investigation,[21] direct electrical stimulation of the sciatic nerve resulted in EEG activation when serum thiopental concentrations were between 15 and 27 μg/ml. In this canine study, no consistent activation of the EEG was seen during the application of sciatic nerve stimulation when serum thiopental concentrations were greater than 37 μg/

ml. We examined the EEG immediately before each noxious stimulus and for the next 15–30 s. We did not see any evidence of EEG activation (increase in number of waves per second) with any of the stimuli at a wide range of serum thiopental concentrations, despite patients' purposeful movements. It is possible that EEG activation would have been seen if the noxious stimuli had applied for a longer period of time. It is also possible that spinal and brain stem reflexes (as evident by the coughing/bucking to laryngoscopy/intubation) are present but may not be detected by the cortical EEG.

This study confirmed the biphasic EEG number of waves per second *versus* serum thiopental concentration relationship that we previously described.[5] Because in the current study only two constant serum thiopental concentrations were achieved in each patient, it was not possible to resolve the relationship of biphasic serum thiopental concentration *versus* number of waves per second in an individual subject, as we did previously.[5] The goal of the current study was to relate the EEG response to the clinical measures of anesthetic depth for the different noxious stimuli.

Loss of verbal responsiveness occurred during EEG activation at 12–18 waves/s relative to the awake baseline value of 8–12 waves/s. Movement response to tetanic nerve stimulation and trapezius muscle squeeze will occur if the EEG is activated and there are greater than 15 waves/s. Consistent lack of movement to tetanic nerve stimulation and trapezius muscle squeeze occurred only when there were fewer than 5 waves/s. The broad range of EEG waves/s from movement to no-movement (5 to 15) results from the biphasic concentration *versus* EEG response relationship where the same number of waves per second can occur at two different serum thiopental concentrations.

The biphasic relationship of serum thiopental concentration *versus* EEG number of waves per second complicates and limits the interpretation of the EEG as a measure of clinical depth. For serum thiopental concentrations greater than 30 μg/ml there is a progressive decrease in the number of waves per second as the serum thiopental concentration increases. Zero waves per second (isoelectric EEG with intermittent bursts) occurs at serum thiopental concentrations greater than 50 μg/ml. Figure 7 indicates that movement responses were common despite profound EEG slowing (0–3 waves/s). The EEG reached its maximal response (isoelectric signal) before consistent lack of movement occurred to the most noxious stimulus, laryngoscopy and intubation. Our data demonstrate the need to find an EEG parameterization that results in a monophasic response to increasing thiopental serum concentrations. The EEG parameter we used, number of waves per second from aperiodic waveform analysis, will not be practical as a monitor of depth of anesthesia for thiopental when it is used alone because of the biphasic effect and the inability to predict response to the most noxious stimuli. It is possible, however, by adding another anesthetic drug (*i.e.*, nitrous oxide or an opiate) that provides moderate analgesia, that the thiopental serum concentrations needed to achieve the lack of movement will decrease to a level where EEG response occurs.

In summary, we developed a method to assess clinical anesthetic depth for the iv anesthetic drugs. Our approach uses a CCIP to obtain constant serum concentrations over a clinically relevant range. Stimuli that vary in degree of noxiousness are then applied and the responsiveness of the patient observed. Using movement as the clinical measure of response and the measured constant serum thiopental concentrations, it is possible to quantitate the CNS sensitivity in a group of patients to the different stimuli. CNS sensitivity is estimated by the Cp_{50} for each stimulus. Our study demonstrates that extremely high serum thiopental concentrations are necessary to prevent movement response to laryngoscopy and intubation. We also examined the relationship of the EEG changes induced by thiopental to the clinical depth of anesthesia. The number of waves per second from aperiodic waveform analysis was used as a measure of thiopental EEG effect. The biphasic nature of the thiopental serum concentration–EEG relationship and the isoelectricity at high serum thiopental concentration complicate and limit the interpretation of the correlation between the EEG effect and the clinical responses. Using thiopental alone, movement to the profoundly noxious stimulation of laryngoscopy followed by intubation was observed in the presence of markedly slowed and isoelectric EEG waveforms.

The analytical chemistry assistance of Mrs. Sandra Harapat and the editorial assistance of Mrs. Georgette Bozovich are gratefully acknowledged.

References

1. Woodbridge PD: Changing concepts concerning depth of anesthesia. ANESTHESIOLOGY 18:536–550, 1957
2. Prys-Roberts C: Anaesthesia: A practical or impossible construct (editorial)? Br J Anaesthesia 59:1341–1345, 1987
3. Eger EI II, Saidman LJ, Brandstater B: Minimal alveolar anesthetic concentration: A standard of anesthetic potency. ANESTHESIOLOGY 26:756–763, 1965
4. Stanski DR: Monitoring Depth of Anesthesia, Anesthesia. Edited by Miller RD. New York, Churchill-Livingston, 1990, pp 1001–1029, 1990
5. Bührer M, Maitre PO, Hung OR, Ebling WF, Shafer SL, Stanski DR: Thiopental pharmacodynamics: I. Defining the pseudo–steady-state serum concentration–EEG effect relationship. ANESTHESIOLOGY 77:226–236, 1992
6. Shafer SL, Varvel JR, Aziz N, Scott JC: Pharmacokinetics of fentanyl administered by a computer-controlled infusion pump. ANESTHESIOLOGY 73:1091–1102, 1990

7. Stanski DR, Burch PG, Harapat S, Richards RK: Pharmacokinetics and anesthetic potency of a thiopental isomer. J Pharm Sci 72: 937–940, 1983
8. Stoelting RK, Longnecker DE, Eger EI II: Minimum alveolar concentrations in man on awakening from methoxyflurane, halothane, ether and fluoroxene anesthesia: MAC awake. ANESTHESIOLOGY 33:5–9, 1970
9. Yakaitis RW, Blitt CD, and Angiulo JP: End-tidal halothane concentration for endotracheal intubation. ANESTHESIOLOGY 47: 386–388, 1977
10. Roizen MF, Horrigan RW, and Frazer BM: Anesthetic doses blocking adrenergic (stress) and cardiovascular responses to incision: MAC BAR. ANESTHESIOLOGY 54:390–398, 1981
11. Becker KE: Plasma levels of thiopental necessary for anesthesia. ANESTHESIOLOGY 49:192–196, 1978
12. Ausems ME, Hug CC Jr, Stanski DR, Burm AGL: Plasma concentrations of alfentanil needed to supplement nitrous oxide anesthesia for general surgery. ANESTHESIOLOGY 65:362–373, 1986
13. King BD, Harris LC, Greifenstein FE, Elder JD, Dripps RD: Reflex circulatory responses to direct laryngoscopy and tracheal intubation performed during general anesthesia. ANESTHESIOLOGY 12:556–566, 1951
14. Stoelting RK: Circulatory changes during direct laryngoscopy and tracheal intubation: Influence of duration of laryngoscopy with or without prior lidocaine. ANESTHESIOLOGY 47:381–384, 1977
15. Dundee JW: Alterations in response to somatic pain: II. The effect of thiopentone and pentobarbitone. Br J Anaesth 32:407–414, 1960
16. Yli-Hankala A, Eskola H, Kaukinen S: EEG spectral power during halothane anaesthesia: A comparison of spectral bands in the monitoring of anaesthesia level. Acta Anaesthesiol Scand 33: 304–308, 1989
17. Schwilden H, Schuttler J, Stoeckel H: Quantitation of the EEG and pharmacodynamic modeling of hypnotic drugs: Etomidate as an example. Eur J Anaesthesiol 2:121–130, 1985
18. Schwilden H, Schuttler J, Stoeckel H: Closed-loop feedback control of methohexitone anesthesia by quantitative EEG analysis in humans. ANESTHESIOLOGY 67:341–347, 1987
19. Schwilden H, Stoeckel H: Quantitative EEG analysis during anaesthesia with isoflurance and nitrous oxide at 1.3 and 1.5 MAC. Br J Anaesth 59:738–745, 1987
20. Schwilden H, Stoeckel H, Schuttler J: Closed-loop feedback control of propofol anaesthesia by quantitative EEG analysis in humans. Br J Anaesth 62:290–296, 1989
21. Miyauchi Y, Sakebe T, Maekawa T, Ishikawa T, Takeshita H: Responses of EEG, cerebral oxygen consumption and blood flow to peripheral nerve stimulation during thiopentone anesthesia in the dog. Can Anaesth Soc J 32:491–497, 1985

Plaintiff's Exhibit 32

to

Complaint for Declaratory Judgment and Injunctive Relief

Dr. David Lubarsky
2010 Affidavit

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

EDWARD JEROME HARBISON,	)	
	)	
Plaintiff,	)	
	)	**No. 3:06-cv-01206**
v.	)	**Judge Trauger**
	)	
GAYLE RAY, *et al*,	)	
	)	
Defendants.	)	

AFFIDAVIT OF DAVID A. LUBARSKY, M.D., M.B.A.

Comes now the affiant, David A. Lubarsky, M.D., M.B.A., and declares under the penalty of perjury as follows:

1. My name is David A. Lubarsky. I live in Miami, Florida.

2. I graduated from Washington University with a B.S. in 1980 and an M.D. in 1984. I also hold an M.B.A. from Duke University (1999).

3. I am licensed to practice medicine in New York (1985), North Carolina (1988) and Florida (2002). I moved from North Carolina to Florida, and while applying for a full license, in 2001 and early 2002, held a Florida Board of Medicine Medical Faculty Certificate.

4. I am board certified by the National Board of Medical Examiners, the American Board of Anesthesiology (placing in the 99th percentile on Part I of its examination), and have completed the American Board of Anesthesiology Maintenance of Certification Exam (2004), and am

certified by the American Academy of Pain Management.

5. I serve as the Emanuel M. Papper Professor and Chairman, Department of Anesthesiology, University of Miami School of Medicine, with a secondary academic appointment as Professor, Department of Management, University of Miami School of Business.

6. I have published, as author and co-author, 127 books, chapters, monographs, journal articles, and other publications or abstracts, primarily in the area of anesthesiology. I have also made video presentations and other private sector publications, contributed to conference proceedings and newsletters and created electronic World Wide Web and/or Internet publications to my work.

7. I have lectured, appeared on panels, and served as a visiting professor throughout the United States and in Paris, Hong Kong and Japan.

8. My credentials are set forth in greater detail in the curriculum vitae, a true and correct copy of which is attached hereto, incorporated herein, and marked as Lubarsky Exhibit 1.

9. I have previously testified in this matter as an expert in anesthesiology.

10. I have reviewed the protocol for execution of a death sentence in Tennessee.

11. I have reviewed the Lethal Injection Recorder Checklists from the executions of Robert Glen Coe, (Lubarsky Exhibit 2), Philip Workman, (Lubarsky Exhibit 3), and Steve Henley, (Lubarsky Exhibit 4).

12. I have reviewed the autopsy report of Robert Glen Coe, (Lubarsky Exhibit

5), the autopsy report of Philip Workman, (Lubarsky Exhibit 6), and the autopsy report of Steve Henley, (Lubarsky Exhibit 7).

13. I have reviewed the deposition and hearing testimony in this matter of Bruce Levy, M.D.

14. I have reviewed the affidavit of Stacy Rector, an eyewitness to the execution of Steve Henley, and the attached newspaper articles, (Lubarsky Exhibit 8). These accounts indicate that Mr. Henley's skin color turned blue to purple during the course of his execution. (Lubarsky Exhibit 8, Bates 02 & 04).

15. The Tennessee lethal injection protocol is comprised of the intravenous administration of sodium thiopental, pancuronium bromide and potassium chloride.

16. Adequate anesthesia during an execution by lethal injection is necessary to mitigate the suffering of the condemned. If adequate anesthesia has not been administered, or does not get to the patient, or wears off during the procedure, the condemned will experience the pain of suffocation caused by the administration of pancuronium bromide and feel severe pain from the intravenous administration of potassium chloride. At the same time, the condemned will be unable to communicate his pain because the pancuronium bromide will paralyzed his face, his arms and his entire body so that he cannot express himself either verbally or otherwise.

17. Post-mortem sodium thiopental levels, determined from blood drawn

immediately upon death, are the best, available evidence to determine whether an executed inmate was adequately anesthetized throughout the execution procedure.

18. An extensive review of the medical literature indicates that post-mortem sodium thiopental levels (of blood drawn at or very near the time of death) reflect those at the time of death.

19. Drugs that are sequestered in the body tissues, including sodium thiopental, undergo a post-mortem redistribution that is slight and likely to increase blood levels compared to actual levels at death.

20. To the extent that post-mortem sodium thiopental levels do not accurately reflect the levels of sodium thiopental in the condemned at the time of death, the reported post-mortem level would be elevated. The elevation of the sodium thiopental level is caused by post-mortem distribution.

21. The Robert Coe autopsy report shows the level of thiopental to be 10200ng/ml, which is .0102 mg/ml, which is 10.2 mg/L. (Exhibit 5, Aegis lab report Bates 13).

22. Within a reasonable degree of medical certainty, the post-mortem level of thiopental measured in Mr. Coe would not be sufficient to produce unconsciousness or anesthesia. This means that during the execution procedure, Mr. Coe was probably awake, suffocating in silence, and feeling the searing pain caused by the intravenous injection of potassium chloride.

23. The reported level of pancuronium bromide in Mr. Coe's blood would be

sufficient to cause full paralysis and death by suffocation.

24. Within a reasonable degree of medical certainty, Mr. Coe's death was caused by suffocation induced by pancuronium bromide at a time when he was not adequately anesthetized.

25. The Philip Workman autopsy report shows the level of thiopental to be 18.9 mg/L. (Exhibit 6, autopsy report Bates 03; Aegis lab report Bates 07).

26. Within a reasonable degree of medical certainty, the post-mortem level of thiopental measured in Mr. Workman indicates that he was not fully anesthetized during his execution.

27. In addition, Mr. Workman's autopsy was not performed, and blood was not drawn, until ten (10) days after his execution. (Exhibit 6, autopsy report Bates 03).

28. The blood sample used to determine Mr. Workman's level of thiopental was taken from his heart. (Exhibit 6, autopsy report Bates 03; Aegis lab report Bates 07).

29. According to the testimony of Dr. Levy, who performed Mr. Workman's autopsy, thiopental redistributes from the extremities back to the heart following death, making those levels higher than would be found at the time of death. (Exhibit 9, 9/6/07 hearing transcript Vol. 3, p.733-34). I agree with this testimony.

30. Within a reasonable degree of medical certainty, due to the time lapse and post-mortem distribution, there is an even greater probability that the

level of thiopental in Mr. Workman at the time of his death was less than 18.9 mg/L found in the heart blood drawn ten days after his death.

31. Within a reasonable degree of medical certainty, the post-mortem drug level of thiopental measured in Mr. Workman would not be sufficient to produce unconsciousness or anesthesia. This means that during the execution procedure, Mr. Workman was probably awake, suffocating in silence, and feeling the searing pain caused by the intravenous injection of potassium chloride.

32. The reported level of pancuronium bromide in Mr. Workman's blood would be sufficient to cause full paralysis and death by suffocation.

33. Within a reasonable degree of medical certainty, Mr. Workman's death was caused by suffocation induced by pancuronium bromide at a time when he was not adequately anesthetized.

34. The Steve Henley autopsy report shows the level of thiopental to be 8.31 mg/L. (Exhibit 7, autopsy report Bates 02 & 06; Aegis lab report Bates 09).

35. Within a reasonable degree of medical certainty, the post-mortem level of thiopental measured in Mr. Henley would not be sufficient to produce unconsciousness or anesthesia. This means that during the execution procedure, Mr. Henley was probably awake, suffocating in silence, and feeling the searing pain caused by the intravenous injection of potassium chloride.

36. In addition, Mr. Henley's autopsy report reveals his potassium level was

not elevated. (Exhibit 7, autopsy report Bates 02 & 06; Aegis lab report Bates 19).

37. A normal potassium level is consistent with the observations of witnesses to Mr. Henley's execution that the color of his face began to turn blue to purple approximately seven (7) minutes after the execution. This is because a change of color occurs when non-oxygenated blood is pumped to the extremities by a beating heart.

38. The reported level of pancuronium bromide in Mr. Henley's blood would be sufficient to cause full paralysis and death by suffocation.

39. Within a reasonable degree of medical certainty, Mr. Henley's death was caused by suffocation induced by pancuronium bromide at a time when he was not adequately anesthetized.

40. According to the testimony of Dr. Levy, the catheters used in the executions of Robert Coe and Philip Workman remained properly placed. (Exhibit 9, 9/6/07 hearing transcript Vol. 3, p.726; 9/7/07 hearing transcript Vol. 4, p.903-04). This is also reflected on the autopsy reports. (Exhibit 5, autopsy report Bates 05; Exhibit 6, autopsy report Bates 05).

41. According to the autopsy report of Steve Henley, the catheters used in his execution remained properly placed. (Exhibit 7, autopsy report Bates 04).

42. I conclude, within a reasonable degree of scientific certainty and based upon the Tennessee protocol, the results of all autopsies performed following a Tennessee execution by lethal injection, the statements of witnesses to the execution of Steve Henley, the testimony of Dr. Levy,

and, the lethal injection Recorder Checklists for the executions of Mr. Coe, Mr. Workman, and Mr. Henley, that a person subjected to the Tennessee lethal injection protocol will not be adequately anesthetized and will suffer a cruel and inhumane death.

FURTHER AFFIANT SAITH NAUGHT.

I declare under penalty of perjury that the foregoing is true and correct.

DAVID A LUBARSKY, M.D. M.B.A.
Emanuel M. Papper Professor and Chair
Department of Anesthesiology
Perioperative Medicine and Pain Management
University of Miami Miller School of Medicine
and
Professor
Department of Management
University of Miami School of Business

STATE OF FLORIDA)

COUNTY OF METRO-DADE)

Sworn to and subscribed before me by David A. Lubarsky, who provided personal identification or is personally known to me, this 22 day of April, 2010.

Notary Public

My Commission Expires:

6/20/13

BARBARA TROST
MY COMMISSION #DD878721
EXPIRES: JUN 20, 2013
Bonded through 1st State Insurance

Exhibit 1 to Dr. Lubarsky's Affidavit

UNIVERSITY OF MIAMI
CURRICULUM VITAE

Date: July 2007

PERSONAL

Name: David Alan Lubarsky, M.D., M.B.A.

Office phone: (305) 585-7037
Office address: Jackson Health System
1611 NW 12th Avenue, C301
Miami, Florida 33136

Date of birth: August 2, 1959
Place of birth: New York, NY

Present academic rank and title:

Primary academic appointment: **Emanuel M. Papper Professor and Chairman**
Department of Anesthesiology
Professor of Anesthesiology, with tenure
University of Miami School of Medicine

Secondary academic appointment: **Professor**
Department of Management
University of Miami School of Business

Citizenship: U.S.A.

HIGHER EDUCATION

Washington University, St. Louis, MO, May, 1980, B.A.
Washington University School of Medicine, St. Louis, MO, May, 1984, M.D.
Fuqua School of Business, Duke University, Durham, NC, August, 1999, M.B.A.

Medical licensure: November, 2002 – Florida State License #ME86449
December, 2001-Florida Board of Medicine
Medical Faculty Certificate-Number: 1457
July, 1988–North Carolina State License #32774
July, 1985–New York State License #162663-1

Certification: National Board of Medical Examiners–July, 1985
Part I American Board of Anesthesiology (99th%) –July, 1987
Part II Board Certification–October, 1988
Recertified American Board of Anesthesiology – July 2004
American Academy of Pain Management–1991

Previous Academic Appointments

Professor (with tenure) and Vice-Chairman,
Chief Division of General, Vascular and Transplant Anesthesia and Surgical Intensive Care
Department of Anesthesiology,
Duke University Medical Center
July 1988 – November 2001

Adjunct Professor. Fuqua School of Business, Duke University 6/2000-6/2002

Academic training:

Weekend Executive Masters in Business Administration (WEMBA) Program
The Fuqua School of Business
Duke University
January 1998 – August 1999
Honored as Fuqua Scholar (top of class)

Fellowship in Transesophageal Echocardiography
Duke University Medical Center
Fiona M. Clements, M.D., Chief, Division of Cardiac Anesthesiology
Joseph A. Kisslo, M.D., Director, Echocardiography Lab
October 1992–December 1992

Fellowship in Cardiac and Vascular Anesthesia and Clinical Research
New York University Medical Center
Stephen Thomas, M.D., Division Head
July 1987–June 1988

Residency
Department of Anesthesiology
New York University Medical Center
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July 1985–June 1987

Internship
Department of Medicine
Westchester County Medical Center
Richard Levere, M.D., Chairman
July 1984–June 1985

PUBLICATIONS

Books published:

1. Gallagher C, Martinez-Ruiz R, **Lubarsky DA**: Anesthesia Unplugged A Step by Step Guide to Techniques and Procedures. New York, NY: McGraw Hill, 2007. p. 1 – 456.

2. Robertson KM, **Lubarsky DA**, Ranasinghe S: Anesthesiology Pearls of Wisdom 2nd edition. New York, NY: McGraw Hill, 2005. p. 1 – 431.

3. Thiemann LJ, Robertson KM, **Lubarsky DA**, Ranasinghe S: Pearls of Wisdom Nurse Anesthetist Exam Review. New York, NY: McGraw Hill, 2005. p. 1 - 425.

4. Robertson KM, **Lubarsky DA**: Preparing for the Written Boards: Pearls of Wisdom. Boston Medical Publishing, June 2001.

5. Gallagher CJ, Hill SE, **Lubarsky DA**: Board Stiff Too: Preparing for the Anesthesia Orals. Boston, Butterworth-Heinemann, 2000.

6. **Lubarsky DA**: The Answer Key to the Written Boards. Durham, NC, A+ Homeprep, 1992, 2nd edition 1993, 3rd edition 1994, 4th edition 1995.

7. Gallagher CJ, **Lubarsky DA**: Preparing for the Anesthesia Orals: Board Stiff. Boston, Butterworths, 1990.

Book chapters and monographs published:

1. Ellis J, Roizen M, Mantha S, Schwartze G, McKinsey J, **Lubarsky D**, Kenaan C: Anesthesia for Vascular Surgery. Clinical Anesthesia 5th Edition, Lippincott Williams & Wilkins Publishing, June 24, 2005, Chapter 32:933 – 73.

2. **Lubarsky DA** and Locke J, Ambulatory Anesthesia Billing, Ambulatory Anesthesia & Perioperative Analgesia Manual, McGraw-Hill Companies, 2005, Chapter 12:115 – 122.

3. J.G Reves, Peter S.A. Glass, **David A. Lubarsky**, Matthew D. McEvoy: Intravenous Nonopioid Anesthestics. Miller's Anesthesia 6th Edition, Elsevier Publishing, 2004 chapter 10.

4. Gayer S and **Lubarsky DA**: Cost-effective Anti-emesis. In International Anesthesiology Clinics: Post-operative nausea and Vomiting 2003 Vol 41(4):145-164.

5. Knudsen NW, Sebastian MW, **Lubarsky DA**: Cost containment in vascular surgery. Seminars in Cardiothoracic and Vascular Anesthesia 2000 (November) Vol 4(4):256-264.

6. Rock P, **Lubarsky DA**: The business of perioperative medicine. Anesthesiology Clinics of North America 18(3):677-698, 2000.

7. Reves JG, Glass PSA, **Lubarsky DA**: Nonbarbiturate intravenous anesthetics, Anesthesia, fifth edition. Edited by Miller RD. New York, Churchill Livingstone, pp 228–272, 2000.

8. Dear GdeL, Panten RR, **Lubarsky DA**: Operating room information systems. Seminars in Anesthesia, Perioperative Medicine and Pain. Edited by Katz RL and Ward DS. Vol 18, No 4 (December), pp 322-333. 1999.

9. **Lubarsky DA**: How to write clinical guidelines for value-based anesthesia care, Anesthesia Practice Management: How to Assess and Promote Value. Monograph of the Ad Hoc Committee on Value-Based Anesthesia Care. Copyright American Society of Anesthesiologists, 1999.

10. Tardiff BE, Jollis JG, **Lubarsky DA**: Use of information systems and large databases in cardiovascular medicine, Outcome Measurements in Cardiovascular Medicine. Edited by Tuman KJ. Lippincott Williams & Wilkins, pp 67–80, 1999.

11. Lineberger CK, **Lubarsky DA**: Anesthesia for carotid endarterectomy. Curr Opin Anaesthesiol 11:479–484, 1998.

12. Panten RR, Dear GdeL, **Lubarsky DA**: Pharmacoeconomics and practice guidelines: Moving toward value-based care, Problems in Anesthesia, Vol. 10, No. 3. Edited by Arens JF, Prough DS. Baltimore, Williams & Wilkins, pp 285–291, 1998.

13. Inge WW, Grichnik KP, Lineberger CK, **Lubarsky DA**: Vascular surgery in the geriatric patient, Geriatric Anesthesiology. Edited by McLeskey CH. Baltimore, Williams & Wilkins, pp 637–644, 1997.

14. **Lubarsky DA**, Moskop RJ: The "niche" of etomidate in current anesthetic practice, Progress in Anesthesia. Edited by Eisenkraft JB. Philadelphia, WB Saunders, pp 155–168, 1994.

15. Reves JG, Glass PSA, **Lubarsky DA**: Nonbarbiturate intravenous anesthetics, Anesthesia, Fourth edition. Edited by Miller RD. New York, Churchill Livingstone, pp 247–289, 1994.

16. Gallagher C, Sladen RN, **Lubarsky DA**: Thoracotomy: postoperative complications, Problems in Anesthesia: Thoracic Anesthesia, Vol. 4, No. 2, June 1990. Edited by Brodsky JB. Philadelphia, JP Lippincott, pp 393-415, 1990.

17. **Lubarsky DA**, Rodman R: Carotid endarterectomy: General versus regional anesthesia, Problems in Anesthesia: Cardiovascular Anesthesia, Vol. 1, No. 3, July–September 1987. Edited by Thomas SJ. Philadelphia, JP Lippincott, pp 496-510, 1987.

Journals:

1. Dexter F, Vigoda M, **Lubarsky D**, Bimbach D, Duncan R: Use of an Anesthesia Information System to Identify and Trend Gender Disparities in Outpatient Medical Management of Patients with Coronary Artery Disease. Anesth Analg 2007 (in publication)

2. Gan TJ, **Lubarsky DA**: "How much are patients willing to pay to avoid postoperative muscle pain associated with Succinylcholine?" Journal of Clinical Anesthesia 2007 (in publication)

3. Vigoda M, **Lubarsky DA**, Gencorelli F: Discrepancies in Medication Entries Between Anesthetic and Pharmacy Records Using Electronic Databases. Anesth Analg 2007 (in publication)

4. Vigoda M, Lubarsky DA: Discrepancy Between Picis and Pyxis. Anesth Analg 2007 (in publication)

5. Zimmers TA, Sheldon JP, **Lubarsky DA**, Lopes-Munoz F, Waterman L, Weisman R, Koniaris LG: Lethal Injection for Execution: Chemical Asphyxiation? Plos Medicine 2007; 4:1-8.

6. Zimmers TA, **Lubarsky DA**: Physician Participation in Lethal Injection Executions Current Opinion in Anesthesiology. Current Opinion in Anaesthesiology 2007 20(2):147-151.

7. Dexter F, **Lubarsky DA**: Version 1: Psychological Basis for Anesthesiologists' Operating Room Managerial Decision Making on the Day of Surgery. Anesth Analg 2007 (in publication)

8. Dexter F, Willemsen-Dunlap A, Dow A, Lee J, **Lubarsky DA**: Version 2: Computer Generated Recommendations vs. Status Displays to Aid Operating Room Managerial Decision Making on the Day of Surgery. Anesth Analg 2007 (in publication)

9. Candiotti KA, Nhuch F, Kamat A, Deepika K, Arheart KL, Birnbach DJ, **Lubarsky DA**: Granisetron vs. Ondansetron Treatment for Breakthrough Postoperative Nausea and Vomiting After Prophylactic Ondansetron Failure: A Pilot Study. Anesth Analg 2007 104:1370-1373.

10. O'Sullivan CT, Dexter F, **Lubarsky DA**, Vigoda M: Evidence-based Management Assessment of Return on Investment from Anesthesia Information Management Systems. AANA Journal, 2007 vol. 75; 1.

11. **Lubarsky DA**, Candiotti K, Harris E; Understanding Modes of Moderate Sedation during Gastrointestinal Procedures: A Current Review of the Literature. J Clin Anesth, 2007 (in publication)

12. **Lubarsky DA**, Harris E; Complication of Anesthesia (Local, Topical, General). Lancet, 2007 (in publication)

13. Olson RP, **Lubarsky D**; Anemia Screening in Elective Surgery: Definition, Significance and Patients' Interests. Anesth Analg, 2006 103:779-780.

14. Vigoda MM, Gencorelli F, **Lubarsky DA**; Changing Medical Group Behaviors: Increasing the Rate of Documentation Quality Assurance Events Using an Anesthesia Information System. Anesth Analg 2006 103:390-395.

15. Vigoda MM, **Lubarsky DA**; The Medicolegal Importance of Enhancing Timeliness of Documentation When Using an Anesthesia Information System and the Response to Automated Feedback in an Academic Practice. Anesth Analg 2006 103:131-136.

16. Vigoda MM, **Lubarsky DA**; Failure to Recognize Loss of Incoming Data into an Anesthesia Record Keeping System Increased Medical Liability. Anesth Analg, 2006 102:1798-1802.

17. Zimmers TA, **Lubarsky DA**, Sheldon JP, Koniaris LG; Inadequate Anaesthesia in Lethal Injection for Execution – Author's Reply. The Lancet 2005, vol. 366; 9491:1074-1076.

18. Koniaris LG, Zimmers TA, **Lubarsky DA**, Sheldon JP; Evidence of Inadequate Anaesthesia in Lethal Injection for Execution. The Lancet 2005, vol. 365; 9468:1412-1414.

19. **Lubarsky D**, Reves JG: Effect of Subspecialty Organization of an Academic Department of Anesthesiology on Faculty Perceptions of the Workplace. Jamcollsurg 2005, vol. 201; 3:434-437.

20. Candiotti K, Kamat A, Barach P, Nhuch F, **Lubarsky D**, Birnbach D; Emergency Preparedness for Biological and Chemical Incidents – A Survey of Anesthesiology Residency Programs in the United States. Anesth Analg 2005 101:1135-1140.

21. Olson RP, Stone A, **Lubarsky D**; Prevalence and Significance of Low Preoperative Hemoglobin in ASA 1 or 2 Outpatient Surgery Candidates. Anesth Analg 2005, 101:1337-1340.

22. Candiotti KA, Birnbach DJ, **Lubarsky DA**, Nhuch F, Kamat A, Koch WH, Nikoloff M, Wu L, Andrews D; The Impact of Pharmacogenomics on Postoperative Nausea and Vomiting. Anesthesiology 2005 102;543-549.

23. Wachtel RE, Dexter F, **Lubarsky D**: Financial Implications of a Hospital's Specialization in Rare Physiologically Complex Surgical Procedures. Anesthesiology 2005 103(1); 161-167.

24. **Lubarsky D**: Incentivize Everything, Incentivize Nothing. Anesth Analg 2005;100:490-2.

25. Macario A, Dexter F, **Lubarsky D**: Meta- Analysis of Trials Comparing Postoperative Recovery After Anesthesia with Sevoflurane or Desflurane. Am J Health-Syst Pharm 62:63-68, 2005.

26. Dexter F., **Lubarsky, D**: Using Length of Stay Data from a Hospital to Evaluate Whether Limiting Elective Surgery at the Hospital is an Inappropriate Decision. J Clin Anesth 2004 16:421-425.

27. Dexter F, Abouleish A, Whitten C, **Lubarsky D**, Epstein R: Impact of Reducing Turnover times on Staffing Costs. Anesth Analg 2004 98:872.

28. Gan TJ, **Lubarsky DA**, Flood EM, Thanh T, Masukopf J, Mayne T, Chen C: Patient preferences for acute pain treatment. Br. J. Anaesth 2004 92:681-688.

29. Olson, Ronald P., Schow, Adam J., McCann, Richard, **Lubarsky, David A.**, Gan, Tong J: Absence of adverse outcomes in hyperkalemic patients undergoing vascular access surgery: [Absence de complications chez des patients hyperkaliemiques devant subir une intervention chirurgicale d'acces vasculaire]. Can J Anesth 2003 50:553-557.

30. Abouleish AE, Epstein RH, **Lubarsky DA**, Dexter F: Use of operating room information system data to predict the impact of reducing turnover times on staffing costs. Anesth Analg 2003 97:1119 – 1126.

31. Gan TJ, Ing RJ, Dear G, Wright D, El-Moalem HE, **Lubarsky DA**: How much are patients willing to pay to avoid intraoperative awareness? J Clin Anesth 15:108 – 112, 2003

32. Dexter F, Macario A, Traub RD, **Lubarsky DA**: Operating room utilization alone is not an accurate metric for the allocation of operating room block time to individual surgeons with low caseloads. Anesthesiology, May 2003 98:5.

33. Abouleish AE, Dexter F, Epstein RH, **Lubarsky DA**, Whitten CW, Prough DS: Labor costs incurred by anesthesiology groups due to operating rooms not being allocated and cases not being scheduled to maximize operating room efficiency. Anesth Analg 2003:96:1109 – 1113.

34. Schow AJ, **Lubarsky DA**, Gan TJ: Can succinylcholine be safely used in hyperkalemic patients? Anesth Analg 2002 95:119-122.

35. Dexter F, Blake JT, Penning DH, **Lubarsky DA**: Calculating a potential increase in hospital margin for elective surgery by changing operating room time allocations or increasing nursing staffing to permit completion of more cases. Anesth Analg 2002 94:138-142

36. Dexter F, **Lubarsky DA**, Blake JT: Sampling error can significantly affect measured hospital financial performance of surgeons and resulting operating room time allocations. Anes Analg 95:184-188, 2002.

37. Dexter F, Blake JT, Penning DH, Sloan B, Chung P, **Lubarsky DA**: Use of linear programming to estimate impact of changes in a hospital's operating room time allocation on perioperative variable costs. Anesthesiology 2002; 96:718–724.

38. Dexter F, Gan TJ, Naguib M, **Lubarsky DA**: Cost identification analysis for succinylcholine. Anesth Analg 92:693-699, 2001.

39. Dexter F, Macario A, **Lubarsky DA**: The impact on revenue of increasing patient volume at surgical suites with relatively high operating room utilization. Anesth Analg 92:1215-1221, 2001.

40. Gan TJ, Sloan F, Dear G, El-Moalem H, **Lubarsky DA**: How much are patients willing to pay for avoidance of postoperative nausea and vomiting? Anesth Analg 92:393-400, 2001.

41. Bell ED, Penning DH, Cousineau EF, White WD, Hartle AJ, Gilbert WC, **Lubarsky DA**: How much labor is in a labor epidural? Manpower cost and reimbursement for an obstetric analgesia service in a teaching institution. Anesthesiology 92:851-8, 2000.

42. Hill RP, **Lubarsky DA**, Phillips-Bute B, Fortney JT, Creed MR, Glass PSA, Gan TJ: Cost-effectiveness of prophylactic antiemetic therapy with ondansetron, droperidol, or placebo. Anesthesiology 92:958-67, 2000.

43. **Lubarsky DA**, Fisher SD, Slaughter TF, Green CL, Lineberger CK, Astles JR, Greenberg CS, Inge III WW, Krucoff MW: Myocardial ischemia correlates with reduced fibrinolytic activity following peripheral vascular surgery. J Clin Anesth 12:136-41, 2000.

44. **Lubarsky DA**, Reves JG: Using Medicare multiples results in disproportionate reimbursement for anesthesiologists compared to other physicians. J Clin Anesth 12:238-241, 2000.

45. Dexter F, Macario A, Manberg PJ, **Lubarsky DA**: Computer simulation to determine how rapid anesthetic recovery protocols to decrease the time for emergence or increase the phase I postanesthesia care unit bypass rate affect staffing of an ambulatory surgery center. Anesth Analg 88:1053–1063, 1999.

46. Dexter F, Macario A, **Lubarsky DA**, Burns DD: Statistical method to evaluate management strategies to decrease variability in operating room utilization: Application of linear statistical modeling and Monte-Carlo simulation to operating room management. Anesthesiology 91:262–274, 1999.

47. Dexter F, Macario A, Traub RD, Hopwood M, **Lubarsky DA**: An operating room scheduling strategy to maximize the use of operating room block time: computer simulation of patient scheduling and survey of patients' preferences for surgical waiting time. Anesth Analg 89:7–20, 1999.

48. Zhou J, Dexter F, Macario A, **Lubarsky DA**: Relying solely on historical surgical times to estimate accurately future surgical times is unlikely to reduce the average length of time cases finish late. J Clin Anesth 11:601–605, 1999.

49. Dexter F, **Lubarsky DA**, Gilbert BC, Thompson C: A method to compare costs of drugs and supplies among anesthesia providers: A simple statistical method to reduce variations in cost due to variations in case mix. Anesthesiology 88:1350–1356, 1998.

50. Dexter F, Penning DH, **Lubarsky DA**, DeLong E, Sanderson I, Gilbert BC, Bell E, Reves JG: Use of an automated anesthesia information system to determine reference limits for vital signs during cesarean section under general or spinal anesthesia: Application to medical malpractice claims. J Clin Monit Comput 14:491–498, 1998.

51. Lineberger CK, **Lubarsky DA**: Con: General anesthesia and regional anesthesia are equally acceptable choices for carotid endarterectomy. J Cardiothorac Vasc Anesth 12:115–117, 1998.

52. Pisetsky MA, **Lubarsky DA**, Capehart BP, Lineberger C, Reves JG: Valuing the work performed by anesthesiology residents and the financial impact on teaching hospitals of a reduced anesthesia residency program size. Anesth Analg 87:245–254, 1998 [published erratum appears in Anesth Analg 1998 Nov;87(5):1031].

53. Coleman RL, Sanderson IC, **Lubarsky DA**: Anesthesia information management systems as a cost containment tool. CRNA 8(2): 77–83, 1997.

54. **Lubarsky DA**, Glass PSA, Ginsberg B, Dear G de L, Dentz ME, Gan TJ, Sanderson IC, Mythen MG, Dufore S, Pressley CC, Gilbert WC, White WD, Alexander ML, Coleman RL, Rogers MC, Reves JG: The successful implementation of pharmaceutical practice guidelines: Analysis of associated outcomes and cost savings. Anesthesiology 86:1145–1160, 1997.

55. **Lubarsky DA**, Sanderson IC, Gilbert WC, King KP, Ginsberg B, Dear G de L, Coleman RL, Pafford TD, Reves JG: Using an anesthesia information management system as a cost containment tool: Description and validation. Anesthesiology 86:1161–1169, 1997.

56. Astles JR, **Lubarsky DA**, Loun B, Sedor FA, Toffaletti JG: Pneumatic transport exacerbates interference of room air contamination in blood gas samples. Arch Path Lab Med 120(7):642–647, 1996.

57. **Lubarsky DA**: Fast track in the post-anesthesia care unit: Unlimited possibilities? J Clin Anes 8:70S–72S, 1996.

58. Dentz ME, **Lubarsky DA**, Smith LR, McCann RL, Moskop RJ, Inge W, Grichnik KP: A comparison of amrinone with sodium nitroprusside for control of hemodynamics during infrarenal abdominal aortic surgery. J Cardiothorac Vasc Anesth 9:486–490, 1995.

59. Hadzija BW, **Lubarsky DA**: Compatibility of etomidate, sodium thiopental and propofol injections with other drugs commonly administered during induction of anesthesia. Am J Health-Syst Pharm 52:997–999, 1995.

60. **Lubarsky DA**, Smith LR, Sladen RN, Mault JR, Reed RL: Defining the relationship of oxygen delivery and consumption: Use of biologic system models. J Surg Res 58:503–508, 1995.

61. **Lubarsky DA**: Understanding cost analyses: Part 1. A practitioner's guide to cost behavior. J Clin Anesth 7:519–521, 1995.

62. Astles R, **Lubarsky DA**, Loun B, Sedor F, Toffaletti J: Pneumatic tube system exacerbates the effect of room air contamination. Clin Chem 41:155, 1995.

63. **Lubarsky DA**, Hahn C, Bennett DH, Smith LR, Brecehoeft SJ, Klein HG, Reves JG: The hospital cost (fiscal year 1991/1992) of a simple perioperative allogeneic red blood cell transfusion during elective surgery at Duke University. Anesth Analg 79:629–637, 1994.

64. Moskop RJ, **Lubarsky DA**: Carbon dioxide embolism during a laparoscopic cholecystectomy. South Med J 87:414–415, 1994.

65. Grichnik KP, Dentz M, **Lubarsky DA**: Hemodynamic collapse during thoracoscopy. J Cardiothorac Vasc Anesth 7:588–589, 1993.

66. Dentz ME, **Lubarsky DA**: Leontiasis ossea: an unusual presentation of a difficult airway. Anesth Analg 76:678-679, 1993.

67. **Lubarsky DA**, Griebel JA, Camporesi EC, Piantadosi CA: Comparison of systemic oxygen delivery and uptake with NIR spectroscopy of brain during normovolemic hemodilution in the rabbit. Resuscitation 23:45-57, 1992.

68. **Lubarsky DA**, Gallagher C, Berend JL: Secondary polycythemia does not increase the risk of perioperative hemorrhagic or thrombotic complications. J Clin Anes 3:99-103, 1991.

69. **Lubarsky DA**, Kaufman B, Turndorf H: Anesthesia unmasking benign Wolff-Parkinson-White-Syndrome. Anesth Analg 68:172-4, 1989.

70. Kronenfeld MA, **Lubarsky DA**, Feiler M, Galloway A, Thomas SJ: The effect of ventilation on aortic blood gases during left ventricular ejection before separation from cardiopulmonary bypass. J Cardiothorac Anes 3:301-304, 1989.

71. **Lubarsky DA**, Kaufman B, Turndorf H: Anesthetic care of a patient with an intracranial hemorrhage after thrombolytic therapy. J Clin Anes 2:276-279, 1989.

Other works, publications, and abstracts:

1. Vigoda M, Elf R, Wu, **Lubarsky DA**: Intraoperative Beta Blocker Use Doesn't Change with Electronic Reminder of Patients Cardiac Status. (Abstract Presentation at the ASA Annual Meeting in Chicago, October 2006) Anesthesiology 2006;105:A1377.

2. Vigoda M, Elf R, Wu, **Lubarsky DA**: Anesthesia Information System Shows Inadequate Intraoperative B Blockade in Patients with CAD. (Abstract Presentation at the ASA Annual Meeting in Chicago, October 2006) Anesthesiology 2006;105:A1376.

3. Avramovich A, Lewis M, Patin S, Bimbach D, **Lubarsky DA**: The Curse of Eve: Maimonides' Perception of Pain. (Abstract Presentation at the ASA Annual Meeting in Chicago, October 2006) Anesthesiology 2006;105:A154.

4. Abouleish AE, Prough AD, **Lubarsky DA**: Unintended Consequences? Unanswered Questions? Anesth Analg, 2006;102:1908-b-1909-b

5. Koniaris L, Zimmers T, **Lubarsky D**: Lethal Injection Redux. Playboy September 2005, P54, Forum: reader Response.

6. M. Vigoda, **D. Lubarsky**: Timeliness of Documentation – Medical Legal Ramifications. (Abstract Presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A1256.

7. M. Vigoda, **D. Lubarsky**: Failure to Recognize Loss of Incoming Data While Using an Automated Anesthesia Record Keeping System Increased medical Liability Exposure. (Abstract Presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A1204.

8. M. Vigoda, **D. Lubarsky**: Unanticipated Drawbacks of Easy Access to the electronic Medical Record – Balancing Security and Availability While Preventing Unauthorized Access Attempts. (Abstract Presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A1268.

9. M. Vigoda, J. Jacque, **D. Lubarsky**, F. Dexter: Increasing QA Completion Rate is Associated with Increased Rate of Documented QA Complications. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005;103:A798.

10. M. Vigoda, **D. Lubarsky**, E. Varga, S. Lin: Anesthesia Information System Demonstrates Use of Intraoperative Beta Blockers in Patients "at risk" for CAD Undergoing Non-Cardiac Surgery. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005; 103:A1278.

11. Candiotti K, Curia L, Rodriguez Y, Birnbach D, **Lubarsky D**: CYP2D6 Frequencies in the South Florida Population as Determined by the Amplichip®CYP450 Assay. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005; 103:A788

12. Candiotti K, Saltzman B, Curia L, Rodriguez Y, **Lubarsky D**: A Comparison of Different Types of HAZMAT Respirators by Anesthesiologists. (Abstract presentation at the ASA Annual Meeting in Atlanta, October 2005) Anesthesiology 2005; 103:A1194.

13. K. Candiotti, A. Kamat, F. Nhuch, **D. Lubarsky**, D. Birnbach: Treating PONV Ondansetron Prophylaxis Failures: A Comparison of Redosing with Ondansetron vs. Granisetron. (Abstract presentation at the IARS 79th Clinical and Scientific Congress in Honolulu, Hawaii, March 11 – 15, 2005).

14. **Lubarsky D**: Financial Implications of a Hospital's Specialization in Rare Physiologically Complex Surgical Procedures. (Poster presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1409.

15. Estacio R, **Lubarsky D**, Barach P: Cardiac Arrest and Death during Anesthesia Secondary to Iatrogenic Hyperkalemia: Case Report and Database Review. (Poster presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1287.

16. Vigoda M, Gencorelli F, Lin S, **Lubarsky D**, Birnbach D: Anesthesia Information System Helps Identify Missed Opportunities for Perioperative Beta Blockade. (Abstract presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1378.

17. Vigoda M, Gencorelli F, Lin S, Birnbach D, **Lubarsky D**: Anesthesia Information System Demonstrates inadequacy of Perioperative Beta Blocker Therapy. (Abstract presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1381.

18. Candiotti K, Nhuch F, Kamat A, **Lubarsky D**, Birnbach D: Pharmacogenomics Affects Postoperative Nausea and Vomiting: The Effects of CYP2D6 Allele Frequency on Ondansetron Prophylaxis Failure. (Abstract presentation at the ASA Annual Meeting in Las Vegas, NV, October 2004) Anesthesiology 2004; 101:A1611.

19. Macario A., **Lubarsky D**: The Impact of Desflurane and Sevoflurane on the Risk of Postoperative nausea and vomiting: a systematic review of the published literature. (Abstract presentation at the IARS 78th Clinical and Scientific Congress, Tampa, Florida, March 2004).

20. Donnelly AJ, Macario A, **Lubarsky DA**: Pharmacoeconomics of Inhaled Anesthetics. (Special Report Activity, ICPME accredited, McMahon Publishing Group, February 2004.

21. Candiotti KA, **Lubarsky DA**, Kamat A, Restler C: Implementation of Granisetron 0.1mg for Prophylaxis of P.O.N.V. (Poster Presentation at the American Society of Healthcare Pharmacists meeting in New Orleans, December 8-10, 2003).

22. Breslin D, **Lubarsky D**, Hopkins M, Gan TJ: Delayed Discharge from the Post Anesthetic Care Unit. An Ongoing Improvement Process. (Abstract presentation at the ASA Annual Meeting, San Francisco, California, October 2003) Anesthesiology 2003; 99:A1136.

23. Epstein RH, Dexter F, Abouleish AE, Whitten CW, **Lubarsky DA**: Cost Savings from Reducing Turnover Time Result From Reductions in Surgical OR Allocations, Not Less Overtime. (Abstract presentation at the ASA Annual Meeting, San Francisco, California, October 2003) Anesthesiology 2003; 99:A1346.

24. Dexter F, **Lubarsky DA**, Uncertainty in the Operating Rooms in Which Cases are Performed Has Little Effect on Operating Room Allocations and Efficiency (Award Winning Abstract Presentation at the AACD 15th Annual Meeting, Orlando, Florida, October 13, 2002).

25. Dexter F, **Lubarsky DA**, Anesthesia Groups with Exclusive Contracts can Quantify the Cost of Operating Rooms Not Being Allocated and Cases Not Being Scheduled to Maximize Operating Room Efficiency (Award Winning Abstract Presentation at the AACD 15th Annual Meeting, Orlando, Florida, October 13, 2002).

26. Gan TJ, **Lubarsky DA**, Main causes of delay in-patient discharge from PACU in a major teaching hospital. (Abstract Presentation at ASA Annual Meeting, Orlando, FL, October 2002) Anesthesiology 2002:96:A1136.

27. **Lubarsky DA**, Reves J. Straightening out RVU Formulas (letter). ASA Newsletter. June 2002.

28. Schow AJ, **Lubarsky DA**, Gan TJ: Can succinylcholine be safely used in hyperkalemic patients? (Abstract Presentation at the 2001 ASA Annual Meeting) Anesthesiology 2001;95:A1009.

29. Olson RP, Schow AJ, Gan TJ, **Lubarsky DA**. Vascular Access Surgery in Hyperkalemic Patients. (Abstract Presentation at the 2001 ASA Annual Meeting) Anesthesiology 2001;95:A1195.

30. Gan T, Dear G, Wright MD, El-Moalem H, Sigl J, **Lubarsky DA**. Patient Willingness to pay for avoidance of anesthesia related postoperative outcomes. (Poster Presentation at the IARS 75th Clinical and Scientific Congress, March 16-20, 2001).

31. Wright D, **Lubarsky DA**, Dear G, Sigl J, Reeves J, Gan T. Willingness to pay to avoid intra-operative awareness. (Poster Presentation at the IARS 75th Clinical and Scientific Congress, March 16-20, 2001).

32. Gan TJ, **Lubarsky DA**: Cost effectiveness ratio: an often misunderstood term (letter). Anesth Analg 88(5):1191–2, 1999

33. Petros KO, Knudsen NK, Sebastian MW, **Lubarsky DA**. Impact of education and practice guidelines for propofol use in the surgical intensive care unit. (Poster Presentation at ACCP/ESCP 1st International Congress on Clinical Pharmacy, Orlando, FL, April 1999) Pharmacotherapy 19(4):P350, 1999.

34. **Lubarsky DA**, DeLong ER: The impact of choice of muscle relaxant on postoperative recovery time. Anesth Analg 87:499–500, 1998.

35. Dear G, **Lubarsky DA**, Gilbert W, J Reves: Compliance with HCFA terminology; an automated system for audit of anesthesia documentation. Anesth Analg 86:S27, 1998.

36. Dear GdeL, King KP, Gilbert WC, **Lubarsky DA**: Is it possible to maintain drug cost savings: a two year follow-up report. Anesthesiology 89:A1352, 1998.

37. DeLong ER, Kwatra MM, Gan TJ, Glass PSA, Sanderson IC, Gilbert WC, Coleman RL, **Lubarsky DA**, Reves JG: A large population study reveals reduced anesthetic requirements in females. Anesthesiology 89:A126, 1998.

38. DeLong ER, Kwatra MM, Gan TJ, Glass PSA, Sanderson IC, Gilbert WC, Coleman RL, **Lubarsky DA**, Reves JG: Aging profoundly decreases anesthetic requirement. Anesthesiology 89:A825, 1998.

39. Gan TJ, **Lubarsky DA**, Sloan F, Dear R, Dear G: How much are patients willing to pay for a completely effective antiemetic? Anesthesiology 89:A7, 1998.

40. Sibert K, D'Ercole F, Gilbert W, Smith F, **Lubarsky DA**: Causes of OR delays: differing perceptions of anesthesiologists and OR nurses. Anesth Analg 84:S54, 1997.

41. **Lubarsky DA**: Understanding the term "cost-effectiveness." J Clin Anes 9:603–604, 1997.

42. **Lubarsky DA**: HMO contracts should cover variable costs too. American Medical News, November 10, Volume 40, Number 42, p. 22, 1997.

43. **Lubarsky DA**: Response to: Bailey PL, Egan TD: The successful implementation of pharmaceutical practice guidelines? Far from convincing! Anesthesiology 87:1583–1584, 1997.

44. **Lubarsky DA**: Response to: Riley ET: Economic analysis of anesthetic drug use. Anesthesiology 87:1585–1586, 1997.

45. **Lubarsky DA**: Response to: Viby-Mogensen J: Implementation of pharmaceutical practice guidelines. Anesthesiology 87:1587, 1997.

46. **Lubarsky DA**: Sustaining cost savings through distribution control and individualized feedback. Anesthesiology 85:A969, 1996.

47. **Lubarsky DA**, Gilbert W, Alexander ML, Sanderson I: Validation of the programming of an anesthesia information management system for cost calculations. Anesthesiology 85:A1046, 1996.

48. Slaughter TF, Gittleson S, Lineberger C, Inge W, Wildermann N, Green C, Greenberg CS, **Lubarsky DA**, Krucoff MW: Continuous 12-lead ECG in patients undergoing peripheral revascularization: Incidence of ischemia and correlation with fibrinolytic activity. Anesthesiology 85:A72, 1996.

49. **Lubarsky DA**, Gan TJ, Glass PSA, Dear GD, Mythen M, Dentz M, White WD, Pressley CC, Dufore SM, Sibert KS, Gilbert WC, Sanderson IC, Coleman R, Ginsberg B, Temo J, Ferrero-Conover D, Alexander ML, Reves JG: PACU clinical outcomes and financial savings following a pharmaceutical cost containment program in anesthesia using practice guidelines. Anesth Analg 82:S285, 1996.

50. King K, Dear G, Ginsberg B, Gilbert W, **Lubarsky DA**: Cost analyses to develop practice guidelines for muscle relaxants. Anesth Analg 82:S233, 1996.

51. Gan TJ, **Lubarsky DA**, Robertson K, Bennett D, Parrillo S, Sanderson I, Jhaveri R: The hospital cost of perioperative transfusion of a unit of red blood cells and other blood products. Anesth Analg 82:S123, 1996.

52. Sanderson IC, Gilbert WC, **Lubarsky DA**: Cost containment using an automated anesthesia record keeper. Anesth Analg 82:S391, 1996.

53. D'Ercole F, Gilbert W, Smith F, **Lubarsky DA**: Programming an automated anesthesia record keeper to track operating room delays. Anesthesiology 85:A976, 1996.

54. Gan TJ, Ginsberg B, Grichnik K, Sullivan F, Muir M, **Lubarsky DA**, Glass PSA: The use of patient-controlled analgesia to compare the efficacy of sufentanil for postoperative analgesia and its relative potency to morphine. Anesth Analg 80(supple 2):S142, 1995.

55. Gan TJ, **Lubarsky DA**, Robertson K, Bennett D, Parrillo S, Sanderson I, Jhaveri R: The hospital cost of perioperative transfusion of a unit of red blood cells and other blood products. Presented at the Joint Congress on Liver Transplantation, London, Sept. 27–30, 1995.

56. Gan TJ, **Lubarsky DA**, Robertson K, Gilbert WC, Grant AP, Reves JG, Clavien P: Analysis of the variable intra-operative anesthesia costs of a liver transplant procedure. Anesthesiology 83:A1053, 1995.

57. Hertz CM, Pressley CC, Dufore SM, Glass PSA, Gan TJ, **Lubarsky DA**: Nausea and vomiting—a costly anesthetic complication? Anesthesiology 83:A1036, 1995.

58. **Lubarsky DA**, Smith LR, Glass PSA: A comparison of maintenance drug costs of isoflurane, desflurane, sevoflurane, and propofol with OR and PACU labor costs during a 60 minute outpatient procedure. Anesthesiology 83:A1035, 1995.

59. Sanderson IC, Gilbert W, Sibert K, **Lubarsky DA**: Evaluation of a program for calculating and plotting isoflurane utilization. Anesthesiology 83:A388, 1995.

60. Mault J, Cilley R, **Lubarsky DA**, Bartlett R, Reed L: Physiologic and mathematical modeling of the oxygen delivery-consumption relationship. Crit Care Med 22:A105, 1994.

61. **Lubarsky DA**, Hahn C, Bennett DH, Smith LR, Bredehoeft SJ, Klein HG, Reves JG: The hospital cost (1992) of a simple perioperative allogeneic red blood cell transfusion. Anesth Analg 78:S258, 1994.

62. Dentz ME, Lineberger CK, Gilbert W, Ginsberg B, **Lubarsky DA**: Postoperative complications following the use of etomidate for thoracic and vascular surgery. South Med J 87(suppl 2):S12, 1994.

63. **Lubarsky DA**, Smith LR, Sladen RN, Mault JR, Reed RL: Defining the relationship of oxygen delivery and consumption: use of biologic system models. Anesthesiology 79:A303, 1993.

64. **Lubarsky DA**, Kaufman BS: Changes in lactate levels with decreased oxygen delivery and oxygen consumption under anesthesia. Anesth Analg 68:S171, 1989.

65. **Lubarsky DA**, Kaufman BS, Sharnick S, Turndorf H: The effects of induction of anesthesia on mixed venous and peripheral venous oxygen saturations. Anesth Analg 13:S172, 1989.

66. **Lubarsky DA**, Kaufman BS: Oxygen delivery under anesthesia: a prospective evaluation of 330 ML/MIN/M2 as a "critical" value. Anesth Analg 68:S173, 1989.

67. **Lubarsky DA**, Piantadosi C, Camporesi E, Griebel J: Measurement of cytochrome aa3 redox potentials by NIR spectroscopy during normovolemic hemodilution. Anesthesiology 71:A550, 1989.

68. **Lubarsky DA**, Capan L, Turndorf H: Spinal anesthesia--determination of hemodynamics by bioimpedance technique. Regional Anesthesia 13:S37, 1988.

69. **Lubarsky DA**, Sharnick S, Feiler M, Kronenfeld M: The effect of ventilation on aortic blood gases during left ventricular ejection prior to separation from cardiopulmonary bypass. Proceedings of the Society of Cardiovascular Anesthesiologists Annual Meeting, 1988.

Video presentations and other private sector publications:

1. VHA Satellite Network – Managing PONV: An Evidence-Based Update on Prevention and Treatment Program. November 2006. Activity made possible through an educational grant from Merck & Company.

2. Improving Outcomes Through Effective Management of PONV CD, Ed Source February 2005, Activity made possible through an unrestricted educational grant from Merck & Company.

3. Supportive Care for Surgical Patients: Confronting the Risks of PONV CD, PGA Annual meeting December 12 – 16, 2003, produced by Accel Healthcare Communications.

4. NMB video tape, October 12, 2003, produced by Abbott Pharmaceuticals.

5. "Permission to Be Pain Free™: Understanding Labor Epidurals," conceived, scripted and presented by David A. Lubarsky, Donald H. Penning, and Janice Henderson; produced as a joint venture between Duke University and The Informed Patient, LLC. © 1999.

6. Sevoflurane, PONV Anzemet & Zofran," (Product representative training video). Written and presented by David A. Lubarsky, produced by Abbott Video Services, September 4, 1998.

7. "The Niche for Etomidate in Current Anesthetic Practice" (2 part training tape series distributed to hospitals nationwide), produced by Abbott Laboratories, 1992.

8. "Anesthesia Insites: Midazolam," training video, scripting and appearance by David A. Lubarsky, produced by Roche Laboratories, 1992.

9. "Anesthesia Insites: Romazicon," training video, scripting and appearance by David A. Lubarsky, produced by Roche Laboratories, 1992.

10. "Clinical Uses of Esmolol: Sub-Section for Uses in Vascular Anesthesia" produced by Anaquest, Inc., 1989.

11. "Anesthesia Demands for Cardiac and Vascular Surgery. Part 1: Cardiac Surgery" by Dr. Lubarsky. BOC Health Care, 1989.

12. "Anesthesia Demands for Cardiac and Vascular Surgery. Part 2: Vascular Surgery" by Dr. Lubarsky. BOC Health Care, 1989.

Conference proceedings and newsletters:

1. **Lubarsky, DA**: New Paradigms in the Prevention of Postoperative nausea and Vomiting (PONV). Advisory board participant 59th Postgraduate Assembly in Anesthesiology (PGA), New York City, New York, December 9 -13, 2005.

2. **Lubarsky, DA**: Being Part of a Multi-specialty Practice group is not a Good Financial Deal. American Society of Anesthesiologists newsletter September 2005 v. 69; 9.

3. **Lubarsky, DA**: Deriving Value from Informational Systems, New Thoughts on Using NSAIDS in Perioperative Pain Management and Post-Operative Nausea and Vomiting. 29th Annual Vail Conference in Anesthesiology, February 1-8, 2003.

4. **Lubarsky, DA**: Understanding PONV. Postgraduate Assembly 56th Meeting, December 6 – 10, 2002.

5. **Lubarsky, DA**: Main Causes of Delay in In-patient Discharge From PACU in a Major Teaching Hospital. American Society of Anesthesiologists Annual Meeting, October 12–16, 2002.

6. **Lubarsky DA**: Are computers useful to reduce costs in outpatient surgery? Society for Ambulatory Anesthesia (SAMBA) 15th Annual Meeting Syllabus, May 5-8, 2000.

7. **Lubarsky DA**: "Putting a Value on Pain, Suffering and Anxiety: Willingness-to-Pay Analyses"
"Pharmaceutical Practice Guidelines";"Computerization in the OR: Electronic Medical Record" published in the syllabus of the Scott & White Symposium, 6th Annual National Meeting, Santa Fe, NM, June 22-24, 2000 (Scott & White Hospital, Temple, TX).

8. **Lubarsky DA**, Reves JG: Using Medicare multiples results in disproportionate reimbursement for anesthesiologists compared to other physicians. Association of Anesthesia Clinical Directors (AACD) 12th Annual Meeting Syllabus, October, 1999.

9. **Lubarsky DA**: Managing perioperative drug and labor costs. Proceedings of the Society of Cardiovascular Anesthesiologists 20th annual meeting, April 24–28, 1998.

10. **Lubarsky DA**: Managing perioperative drug and labor costs. Proceedings of the Association of Anesthesia Clinical Directors Workshop on Operating Room Management, March 21–22, 1998.

11. Dexter F, **Lubarsky DA**: Managing with information: using surgical services information systems to increase operating room utilization. American Society of Anesthesiologists Newsletter 62(10):6–8, 1998.

12. Macario A, **Lubarsky DA**: Why are hospitals enamored with clinical pathways? American Society of Anesthesiologists Newsletter 62(10):9–12, 1998.

13. **Lubarsky DA**: Intravenous anesthesia is too expensive for my practice! Proceedings of the Society for Intravenous Anesthesia annual meeting, October 16, 1998.

14. **Lubarsky DA**: Cost-effective ambulatory anesthesia: The anesthesiologist's view. In the Syllabus for the Society for Ambulatory Anesthesia (SAMBA) 12th Annual Meeting, Lake Buena Vista, FL, May 1–4, 1997.

15. **Lubarsky DA**: ICU care after vascular surgery (con). Proceedings of the Society of Cardiovascular Anesthesiologists 19th Annual Meeting, Baltimore, MD, May 11–14, 1997.

16. **Lubarsky DA**: Practice guidelines, information management and resource utilization: Buzzwords for the new millennium. Proceedings of the Association of Anesthesia Clinical Directors Annual Meeting, October 19, 1997.

17. D'Ercole F, **Lubarsky DA**, Reves JG: Duke's innovative programming of an automated anesthetic record yields information essential for economic management of anesthetic practice. North Carolina Society of Anesthesiologists Newsletter, October, 1996.

18. Becker KE, Johnstone RE, **Lubarsky DA**: Choice of anesthetic drugs and muscle relaxants. American Society of Anesthesiologists Newsletter 59(5):8–11, 1995.

19. Cohen NH, **Lubarsky DA**: Cost-effective use of technology in clinical care. American Society of Anesthesiologists Newsletter 59(8):20–22, 1995.

Electronic, world wide web, and/or internet publications:

1. **Lubarsky DA** (Chief Editor and Project Manager): Anesthesiology On-Line. (1000 Chapter Textbook in preparation for emedicine.com)
2. Commentary: 1997: The year in review. In AnesthesiaWeb, January, 1998.
3. Commentary: Notes from the SCA (Society of Cardiovascular Anesthesiologists) annual meeting. In AnesthesiaWeb, June, 1998.
4. Commentary: What was new at the ASA in Orlando. In AnesthesiaWeb, November, 1998.
5. Commentary: What I did on my fall vacation in San Diego. In AnesthesiaWeb, November 1997.

PROFESSIONAL

Funded research performed:

1. Picis 2005
   $36,00.00 unrestricted grant for research within the Center for Informatics and Perioperative Management (CIPM).
   Role: Co-Principal Investigator with Dr. Michael Vigoda.
2. University of Miami Office of the Provost 2004
   $10,000 - Inter school development grant for development of a business school elective for senior medical students
   Role: Co-Principal Investigator with Dr. Michael Vigoda.
3. Roche Labs 2002
   $ 50,000 educational grant for development/integration of palm pilot based algorithms in the treatment of PONV and preoperative vascular workups.
   Role: Co-Principal Investigator with Dr. Thomas Powell.
4. Organon, Inc. 2000

   $36,000 for project entitled "A Multi-Center Trial to Evaluate the Interaction of Maintenance Doses of Rocuronium with an Intubating Dose of Rapacuronium, Rocuronium, or Succinylcholine."
   Role: Co-Principal Investigators: with Dr. TJ Gan
5. Aspect Medical Systems, Inc. 1999

$22,590 research agreement to support "Willingness to Pay for Avoidance of Awareness During General Anesthesia." Co-Principal Investigators: with Dr.TJ Gan.

6. Abbott Labs 1999-2001
   $250,000 educational grant to direct AnesthesiaWeb.com
   Role: Dr. Lubarsky, Director and Chair, Editorial Board

7. Roche Laboratories 1996 - 1999
   $100,000 grant x 3 years to the Department of Anesthesiology to administer and direct AnesthesiaWeb.com: An Educational Resource for Anesthesia Providers.
   Role: Dr. Lubarsky, Director, Founder and Chair, Editorial Board.

8. North American Dräger 1998 - 2001
   $535,000 to $1.5 million contract to develop an Anesthesia Information Management System (AIMS) for Duke University Medical Center and Health System.
   Role: Co-Principal Investigators with Dr Iain Sanderson

9. Roche 1996
   $45,000 unrestricted research grant in support of Database Use in Outcomes Research, used to fund "The successful implementation of pharmaceutical practice guidelines: Analysis of associated outcomes and cost savings"
   Role: Principal Investigator,

10. Glaxo-Wellcome 1996 - 1997
    $25,000 project grant for "How Much are Patients Willing to Pay to Avoid Postoperative Nausea and Vomiting"
    Role: Principal Investigator

11. Abbott Laboratories 1992 - 1993
    $35,000 research grant to develop an etomidate study
    Role: Principal Investigator

12. Sanofi Winthrop Pharmaceuticals 1993
    $10,000 research grant for the study "Comparison of Amrinone versus Nitroprusside for Hemodynamic Control and Support During Infrarenal Aortic Clamping for Abdominal Aortic Aneurysm Repair".
    Role: Principal Investigator

13. Somatogen 1992
    $13,500 unrestricted research grant to study the cost of perioperative transfusions
    Role: Principal Investigator

Professional organizations:

- American Society of Anesthesiologists, 1988 – Present
- American Medical Association, 1988 – Present
- Association of University Anesthesiologists, 2000 – Present
- International Anesthesia Research Society, 1988 – Present
- Florida Society of Anesthesiologists, 2002 - Present

- North Carolina Society of Anesthesiologists, 1988 – 2002
- Society of Cardiovascular Anesthesia, 1991 – Present

Recent international engagements:

- Invited Speaker - Beta Blockers in Non-Cardiac Surgery: Who, What, When and Why. 20th International Congress of the Israel Society of Anesthesiologists, Tel-Aviv, Israel. September 26 – 29, 2005.

- Featured Speaker - Japanese Society of Anesthesiology, May 2004, Nagoya, Japan.

- Kagoshima University School of Medicine, Department of Anesthesiology & Critical Care, Kagoshima, Japan, May 23 – 29, 2004.

- Commissioned Training in Anaesthesiology 2002/03, Pamela Youde Nethersole Eastern Hospital, Hong Kong [by Dr. Wallace Chiu (wkychiu@ha.org.hk), Chairman, Training Subcommittee in Anaesthesiology, Hospital Authority, Hong Kong] – January 2003
  - Valuing Health Care in 2002
  - Using Information Technology in Medicine – Near Future or False hope?

- Valuing Healthcare lecture XXXIIth International Meeting of Anesthesiology and Critical Care, March 18 & 19, 2000, in Paris, France, Prof. Pierre Coriat, organizer Journees D'Enseignement Post Universitaire (JEPU) (Anesthesiology and Critical Care Conference), Paris, France, March 17-23, 2000. Invited by Dr. Pierre Coriat. Lectures: "Est-on prêt à payer la prise en charge de la douler et de l'anxiété postopératoires?" *or* "Putting a value on pain, suffering and anxiety: willingness to pay?" and "Gestion informatisée des coûtes des agents d'anesthésie" *or* "Managing perioperative drug costs using informatics."

National/state presentations, conferences, speaking and other panel engagements:

Southern University Department of Anesthesiology Chairs (SUDAC) Meeting, Meeting Moderator, Administrative Round Table Discussion. April 13 – April 15, 2007.

Management of PONV. Presentation at the Western Pennsylvania Hospital , Fourth Annual Arizona Anesthesia Adventure, Phoenix, Arizona, March 2 – 5, 2007.

Anesthesia for AAA. Presentation at the Western Pennsylvania Hospital , Fourth Annual Arizona Anesthesia Adventure, Phoenix, Arizona, March 2 – 5, 2007.

Anesthesia for Endovascular Procedures. Presentation at the Western Pennsylvania Hospital , Fourth Annual Arizona Anesthesia Adventure, Phoenix, Arizona, March 2 – 5, 2007.

Negotiations 101: Terminology and Preparation. Presentation at the Western Pennsylvania Hospital , Fourth Annual Arizona Anesthesia Adventure, Phoenix, Arizona, March 2 – 5, 2007.

Neuromuscular Blockers. Presentation at the Western Pennsylvania Hospital , Fourth Annual Arizona Anesthesia Adventure, Phoenix, Arizona, March 2 – 5, 2007.

Understanding the cost and consequences of PONV. Faculty speaker for a satellite symposium to be held during the 60th Postgraduate Assembly in Anesthesiology (PGA), New York City, New York, December 8-10, 2006.

Postoperative Nausea and Vomiting lecture given at the Dallas Society of Anesthesiologists Annual Meeting in Dallas, TX, September 19 – 20, 2006.

The Academic Pain Practice: Can It Survive? Panel Presentation at the ASA Annual Meeting in Chicago, October 2006.

Abdominal Aortic Surgery Including Endovascular. Refresher Course Presentation at the ASA Annual Meeting in Chicago, October 2006.

Education, Economics and Evolution of Cardiovascular Anesthesia. Luncheon Panel Presentation at the ASA Annual Meeting in Chicago, October 2006.

Pharmacoeconomics and Evidence Based Practice: Dispelling Practice Myths and Urban Legends. Panel Presentation at the ASA Annual Meeting in Chicago, October 2006.

Resident Research Forum Presentation at the ASA Annual Meeting in Chicago, October 2006.

Course Director of the Western Pennsylvania Hospital's 3rd Annual Arizona Adventure Conference, Phoenix, Arizona, March 26 – 30, 2006.

Aligning Incentives. Association of Anesthesia Clinical Directors (AACD) Workshop on Operating Room Management, March 10 - 12, 2006.

How to Get What You Want: The Art of Negotiation. Association of Anesthesia Clinical Directors (AACD) Workshop on Operating Room Management, March 10 – 12, 2006.

Southern University Department of Anesthesiology Chairs (SUDAC) Meeting, Guest Faculty, Negotiating with hospitals. March 31 – April 2, 2006.

Arizona Society of Anesthesiologists 32nd Annual Scientific Meeting, Guest Faculty, Finding Value in IT: Near Future or False Hope? February 17 – 19, 2006.

Arizona Society of Anesthesiologists 32nd Annual Scientific Meeting, Guest Faculty, Preventing PONV. February 17 – 19, 2006.

Arizona Society of Anesthesiologists 32nd Annual Scientific Meeting, Guest Faculty, Perioperative Management of the Patient Undergoing Abdominal Aortic Surgery. February 17 – 19, 2006.

SAAC/AAPD. Annual Meeting, session moderator on Training the Anesthesiologist of the Future. Saturday, November 5, 2005.

American Society of Anesthesiologists. Annual Meeting, Refresher Course on Perioperative Management of the Patient Undergoing Abdominal Aortic Surgery. October 22, 2005

American Society of Anesthesiologists, Annual Meeting, Clinical Forum on Cards Consult? Revascularization? Or Just beta-Blocker? October 25, 2005

American Society of Anesthesiologists, Annual Meeting, panel on Pharmaceuticals, Economics and Anesthesia Practice (The Use of Practice Guidelines to Minimize Drug Costs.) October 26, 2004.

American Society of Anesthesiologists, Annual Meeting, panel on Academic Anesthesiology Training Programs – Should you Secede from the Medical School to Better Meet your Academic and Clinical Missions? (Pro: You Should Secede!) October 26, 2004

American Society of Anesthesiologists, Annual Meeting, panel on Practice Management, Oct 14, 2003.

Michigan State Society of Anesthesiologists, April 26, 2003. "Cox-2 Inhibitors: Periprocedural Pain Control and Thoughts on Central Sensitization."

New York State Society of Anesthesiologists, Post Graduate Assembly, panel on the Future of Economics and Anesthesia, Dec 2002.

Panel Chair, Supporting Surgical Outcomes, dinner meeting at PGA, Dec 2002. Presentation, "The Value of PONV therapy."

Medical University of South Carolina Continuing Education Weekend, Charleston, SC, May 4-6, 2001. Lecture: "Current Concepts in Neuromuscular Blockade."

Kansas University Medical Center 51st Annual Postgraduate Symposium on Anesthesiology, Kansas City, Missouri, April 6-8, 2001. Lectures: "Where is the Value in IT?" and "Valuing Healthcare: New Approaches to Costs and Outcomes."

Committee Chair, Drug Information Association workshop in collaboration with the Duke Clinical Research Institute, "Internet Health Information Programs: Integrating Vision and Basic Business Principals," Durham, NC, April 3-4, 2000. Dr. Lubarsky, Program Committee with and Kevin A. Schulman, M.D., M.B.A. (Program Chairperson). Moderator of panel, Specialist content sites. Lecture: "Healthcare Internet Business Models that Work."

Southern University Department of Anesthesia Chairs (SUDAC), Annual Meeting, Charleston, South Carolina, March 23-25, 2001. Lecture and discussion: "Departmental Practice Plans."

International Anesthesia Research Society 75th Clinical and Scientific Congress, Ft. Lauderdale, Florida, March 16-20, 2001. Lecture: "Valuing Health Care: New Approaches to Costs and Outcomes."

Society for Technology in Anesthesia, "STA 2001: An Information Odyssey," Scottsdale, Arizona, January 10-13, 2001. Coordinator of Panel: "Who is the Information Consumer? User Perspectives on Anesthesia Information," and Lecture "Understanding Value Creation from Information Systems Elucidates Consumers of That Information"

The University of Chicago Department of Anesthesia & Critical Care 14th Annual Conference, "Challenges for Clinicians in the New Millennium," Chicago, Illinois, December 1-3, 2000.

Presentations: "Willingness to Pay: Valuing Pain, Suffering & Anxiety in Health Care" and "Understanding the Business of E-Health."

American Society of Anesthesiologists Annual Meeting, San Francisco, CA, October 15-18, 2000. Foundation for Anesthesia Education and Research (FAER) panel on "Information Overload: Data Analysis from Genes to Populations." Lubarsky's presentation: "Clinical Data: Outcomes, Cost and Quality"

Greater Atlanta Society of Anesthesiologists, New Concepts in Neuromuscular Blockade, September 14, 2000

Scott & White Symposium, 6th Annual National Meeting, Santa Fe, NM, June 22-24, 2000. Presentations:
"Putting a Value on Pain, Suffering and Anxiety: Willingness-to-Pay Analyses"
"Pharmaceutical Practice Guidelines"
"Computerization in the OR: Electronic Medical Record"

Society for Ambulatory Anesthesia (SAMBA) Annual Meeting, Washington, DC May 5-8, 2000. Participated on the panel "Managing the Costs of Ambulatory Anesthesia" moderated by Alex Macario, M.D., M.B.A. Presentation: "Are Computers Useful to Reduce Costs in Outpatient Surgery?"
Participated on the panel "Life After Residency" moderated by Peter S.A. Glass, M.B., Ch.B. Presentation: "Managing Your Money."

Committee Chair, Drug Information Association workshop in collaboration with the Duke Clinical Research Institute, Durham, NC, April 3-4, 2000: "Internet Health Information Programs: Overview and Market Opportunities." Dr. Lubarsky, Program Committee with Dr. Robert Califf, Robert Taber, Ph.D., and Kevin A. Schulman, M.D., M.B.A. (Program Chairperson)

New York State Society of Anesthesiologists 53rd Annual Post-Graduate Assembly, New York, NY. Participated on the panel: "The Year 2000: How Computers Will Improve Anesthesia," December 12, 1999. Presentation: "Anesthesia Information Management: Economic Implications."

American Society of Anesthesiologists Annual Meeting, Dallas, TX, October 12, 1999. Panel: "Practice Management/Compliance Coding—What They Didn't Teach Us in Medical School," Peter B. Kane, M.D., Moderator. Presentation: "Income Redistribution: The Politics of Communism in the OR"

American Society of Anesthesiologists Annual Meeting, Dallas, TX, October 12, 1999. Panel on Value-Based Anesthesia, Peter Rock, Panel Moderator. Presentation: "Quality Improvement and Identification of Key Indicators: Are Electronic Record Keepers the Answer?"

Association of Anesthesia Clinical Directors 12th Annual Meeting, October 10, 1999. Abstract presentation: "Using Medicare multiples results in disproportionate reimbursement for anesthesiologists compared to other physicians."

New York State Society of Anesthesiologists 52nd Annual Post-Graduate Assembly, New York, NY. Participated on the "Fraud and Abuse" panel (Current Issues Forum) December 13, 1998. Presentation: "Making the Plan Work: How to Get Doctors to Do What They Don't Want to Do."

Value-Based Anesthesia Care Committee Panel discussion, (a committee of the American Society of Anesthesiologists), Orlando, FL, October 21, 1998. Presentation: "Anesthesia Practice Management: Practice Guideline and Clinical Pathway Development."

Association of Anesthesia Clinical Directors Panel "Practical Approaches to OR Management" at the American Society of Anesthesiologists annual meeting, Orlando, FL, October 19, 1998. Presentation: "Maximizing Use of an Anesthesia Information Management System in 1998—What's New, What's Left to Do, and Is It for YOU?"

Society for Intravenous Anesthesia (SIVA) Annual Meeting, Orlando, FL, October 16, 1998. Lecture: "Is Intravenous Anesthesia Too Expensive for My Practice?"

Society of Cardiovascular Anesthesiologists (SCA) Workshop on Perioperative Cost Management and Contract Negotiation in Cardiac Surgery, Seattle, WA, April 25, 1998. Lecture: "Managing Drug Costs in the Perioperative Period" and leading a breakout session "Managing Labor Costs in the Perioperative Period." April 27, 1998: Breakfast panel with Dr. Robert Johnstone: "Economics and the Cardiovascular Anesthesiologist."

Association of Anesthesia Clinical Directors workshop on operating room management, Phoenix, AZ, March 20–22, 1998. (Invited by Dr. William Mazzei, University of California-San Diego) Lecture: "Real World Cost Reduction."

Nashville Society of Anesthesiologists, Nashville, TN, September 25, 1997.

Pittsburgh Symposium for Nurse Anesthetists, Pittsburgh, PA, September 27, 1997.

International Anesthesia Research Society annual meeting, San Francisco, CA, March 14–18, 1997. "Anesthesia Information Management: Where Are We?" presented by J.G. Reves, M.D., Thomas E. Stanley, M.D. and the Duke Anesthesia Section on Information Systems (Dr. Lubarsky, member).

Society of Cardiovascular Anesthesiologists 19th annual meeting, Baltimore, MD, May 11–14, 1997. (Invited by Steven Frank, M.D. and Jan C. Horrow, M.D., Chair, Scientific Program Committee) Presentation: "ICU Care After Vascular Surgery (Con)."

American Association of Anesthesia Assistants national meeting, Kiawah Island, SC, May 16–18, 1997. Lectures: "The Clinical Use of Sevoflurane" and "The Niche for Etomidate in Current Anesthetic Practice."

American Society of Anesthesiologists Bi-District Meeting, New Orleans, LA, May 23–25, 1997. (Invited by Donald Harmon, M.D. of the Ochsner Hospital) Lecture: "Cost Containment in Anesthesia."

Association of Anesthesia Clinical Directors annual meeting, San Diego, CA, October 19, 1997. (Invited by Barbara DeRiso, M.D., Director of the AACD) Keynote address: "Practice Guidelines, Information Management and Resource Utilization—Buzzwords for the New Millennium."

NC Society of Anesthesiologists 1996 Annual Fall Meeting in Myrtle Beach, SC, September 20–22, 1996. Lecture: "Value Based Anesthesia: The Academic Experience."

Scott & White Memorial Hospital 5th Annual Anesthesia Update/Resident Research Day, Temple, TX, April 13, 1996. (Invited by Charles McLeskey, M.D.) Lectures: "Pharmaceutical Practice Guidelines" and "Management Controversies for the Patient at Risk for Myocardial Ischemia Undergoing Non-cardiac Surgery." After dinner keynote address: "Economics vs. Hypocrites."

American Society of Anesthesiologists annual meeting, Washington, DC, March 9–13, 1996. Poster presentation: "PACU Clinical Outcomes and Financial Savings Following a Pharmaceutical Cost Containment Program in Anesthesia Using Practice Guidelines." Association of University Anesthesiologists Satellite Symposium on Outcomes Research, Chatham, MA, May 19–21, 1996. Poster presentation: "Pharmaceutical Practice Guidelines in Anesthesia: Implementation, Cost Savings and Outcome"

American Society of Anesthesiologists annual meeting, Memorial Convention Center, New Orleans, LA, October 19–23, 1996. Poster Presentation: "Sustaining Cost Savings Through Distribution Control and Individualized Feedback." Poster-Discussion Presentation: "Validation of the Programming of an Anesthesia Information Management System For Cost Calculations."

Society for Intravenous Anesthesia Fourth Annual Meeting, October 20, 1995. Topic: "Does Fast Track Recovery Have Limitless Possibilities?"

Southern University Department of Anesthesia Chairmen (SUDAC) 1995 Annual Meeting, Washington Duke Inn, Durham, NC, April 6–7, 1995. Lecture: "Cost Savings for Hospital and Department—The Duke Plan."

Dallas County Anesthesia Society, Dallas, TX, September 21, 1995.

Tejas Anesthesia, San Antonio, TX, December 7, 1995.

Greater Atlanta Society of Anesthesiologists, Atlanta, GA, November 17, 1994.

Society of Cardiovascular Anesthesiologists Breakfast Panel at the American Society of Anesthesiologists annual meeting, October 17, 1994. Topic on hemodilution: "Will It Work? How Much Will It Cost?"

First National Duke Heart Center Conference—"Shaping the Future: Innovations in Technology, Quality, and Caring" September 22–24, 1994. Presentation: "Patients at Risk for Ischemia Going to the Operating Room for Non-Cardiac Surgery: Management Controversies"

American Society of Anesthesiologists Annual Meeting, Washington, DC, October 9-13, 1993. Poster presentation: "Defining the relationship of oxygen delivery and consumption: use of biologic system models."

American Society of Anesthesiologists Annual Meeting, New Orleans, LA, October 14-18, 1989. Poster presentation: "Measurement of cytochrome aa3 redox potentials by NIR spectroscopy during normovolemic hemodilution."

Visiting professorships, 2007:

Paoli Hospital, Department of Anesthesiology, Paoli, Pennsylvania, April 26, 2007

Visiting professorships, 2006:

University of Cincinnati College of Medicine, Department of Anesthesiology, Cincinnati, Ohio, November 15 -16

Visiting professorships, 2005:

Oklahoma University Health Science Center, Department of Anesthesiology, Oklahoma City, OK, December 15 – 16

Brookwood Medical Center, Department of Anesthesiology, Birmingham, AL, December 5 – 6

Carraway Methodist Hospital, Department of Anesthesiology, Birmingham, AL, December 5 -6

CMC Hospital, Department of Anesthesiology, Charlotte, NC, November 9 – 10

University of Kansas, Department of Anesthesiology, Wichita, Kansas, April 11 – 13

Visiting professorships, 2004:

Brigham & Women's Hospital, Department of Anesthesiology, Boston, MA, October 12

Mount Sinai School of Medicine, Department of Anesthesiology, New York, New York, October 5-7

John Hopkins University, Department of Anesthesiology, Baltimore, MD, August 26 – 27

Greater Baltimore Medical Center, Department of Anesthesiology, Baltimore, MD, August 26 - 27

Kagoshima University School of Medicine, Department of Anesthesiology & Critical Care, Kagoshima, Japan, May 23 – 29

Christiana Hospital, Department of Anesthesiology, Newark, DE, May 11 -12

Visiting professorships, 2003:

Medical College of Georgia, Department of Orthopedics, Macon, Georgia, October 7-8

Hong Kong College of Anesthesiology – lectured at all hospitals in Hong Kong. Hosted by Dr. Wallace Chiu, Pamela Youde Nethersole Eastern Hospital, Department of Anesthesiology, Hong Kong, China, January 6-10

Visiting professorships, 2002:

Washington University, Department of Anesthesiology, St. Louis, Missouri, November 5-6

Baylor University Medical Center, Dallas, Texas, May 21-22 (Grand Rounds: "NMB Update-Re-examining Succinylcholine and it's Alternatives")

University of Wisconsin, Department of Anesthesiology, Madison, Wisconsin, April 2-3

Visiting professorships, 2001:

State University of New York (SUNY) at Stony Brook, Long Island, NY, June 7-8 (Resident lecture: "Understanding Cost Concepts in the Literature" Grand Rounds: "Valuing Health Care: New Approaches to Costs and Outcomes")

University of Miami Medical Center, Department of Anesthesiology, Miami, FL, June 7

Christiana Hospital, Newark, DE, May 30

Peninsula Regional Medical Center, Salisbury, MD, May 29

St. Francis Hospital, Greenville, SC, April 30

University of Texas-Southwestern Medical Center Department of Anesthesiology, Dallas, TX, March 15-16 (Faculty lecture: "What Are Patients Willing to Pay?" Resident lecture: "What Are They Willing to Do About Nausea?")

Atlanta Medical Center Department of Anesthesiology, Atlanta, GA, February 14

Baptist Hospital Anesthesia Group, Pensacola, FL, January 31

Roper and St. Francis Hospitals, Charleston, South Carolina, January 18

Visiting professorships, 2000:

Crawford Long Hospital, Department of Anesthesiology, Atlanta, GA, November 15

St. Luke's-Roosevelt Hospital, Department of Anesthesiology, New York, NY, November 7.

Christiana Hospital and Health System, Department of Anesthesiology, Newark, DE, May 3.

William Beaumont Hospital, Department of Anesthesiology, Royal Oak, MI, April 12.

Visiting professorships, 1999:

University of Texas-Southwestern Medical Center, Parkland Memorial Hospital, Department of Anesthesiology, April 28, 1999.

University of South Florida, Department of Anesthesiology, Tampa General Hospital, Tampa, FL, April 22, 1999.

Visiting Professor, Department of Anesthesiology, Loma Linda University, Loma Linda, CA, January 27, 1999.

Washington Hospital System, Anesthesiology Department, Washington, DC, January 19, 1999.

Rex Hospital, Department of Anesthesiology, Raleigh, NC, June 3, 1999.

Jackson Memorial Hospital, Department of Oral and Maxillofacial Surgery, Miami, FL, March 11, 1999.

Forsyth Memorial Hospital, Anesthesia Department, Winston-Salem, NC, February 11, 1999.

The Scripps System, Anesthesia Department, San Diego, CA, January 27, 1999

Visiting professorships, 1998

St. Joseph's Hospital System, Anesthesia Department, Albuquerque, NM, November 11, 1998.

University of Michigan, Department of Anesthesiology, Ann Arbor, MI, February 25–26: "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium" and "Management Controversies for the Cardiac Patient Undergoing Non-Cardiac Surgery"

St. Anthony Hospital, Denver, CO, September 28, 1998.

Olean General Hospital, Jamestown, NY, September 16, 1998.

St. Vincent's Medical Center in Worcester, MA, May 20, 1998.

Visiting professorships, 1997

Visiting Professor, Stanford University Medical Center, Department of Anesthesia, Stanford, CA, December 3–4, 1997. (Alex Macario, M.D., M.B.A., host) Wednesday Grand Rounds lecture: "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium." Thursday afternoon case discussion and evening case discussion with Drs. Vitez, Navarro, Scibetta, Diachun of the Stanford faculty Health Policies Fellowship.

Fletcher Allen Health Care, M.C.H.V. Campus, Burlington, VT, November 20, 1997.

Visiting Professor, New York University Medical Center, Department of Anesthesiology, New York, NY, November 18–19, 1997. (Invited by Herman Turndorf, M.D., Chair) Guest Speaker at Morbidity & Mortality Grand Rounds. Lectured on Wednesday morning: "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium."

Newark Beth Israel Hospital, Newark, NJ, April 7, 1997.

Hackensack University Medical Center, Hackensack, NJ. April 8, 1997.

Hartford Hospital, Hartford, CT, September 4, 1997.

Rhode Island Hospital, Providence, RI, October 8, 1997.

Abbott Northwestern Medical Center, Minneapolis, MN, November 11, 1997.

Visiting Professor, Medical College of Georgia, Department of Anesthesiology, Augusta, GA, November 12, 1997. Conference presentation: "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium." Case presentation.

Doctors of the Medical Center of Columbus, St. Francis and Doctor's Hospitals, Columbus, GA, November 13, 1997.

Keynote speaker at the program "New Advances in Anesthesia," Methodist Hospital, St. Louis Park, MN, November 10, 1997.

Visiting professorships, 1996

Athens Regional and Saint Mary's Hospitals, joint Grand Rounds, Athens, GA, January 18, 1996.

Visiting Professor, Vanderbilt University Department of Anesthesiology, Nashville, TN, February 22, 1996. (Invited by Charles Beattie, M.D., Ph.D., Chairman) Facilitated a multi-departmental task force meeting. Subject: "Expense Reduction—Anesthesia Drugs." Lecture: "Pharmacoeconomics in Anesthesia."

Piedmont Hospital, Atlanta, GA, March 27, 1996.

Tampa General Hospital, Tampa, FL, May 9, 1996.

Richland Memorial Hospital, Columbia, SC, May 16, 1996.

St. Louis University Department of Anesthesiology, St. Louis, MO, August 14, 1996.

The Medical Center of Central Georgia, Macon, GA, August 22, 1996.

Visiting Professor, University of Alabama–Birmingham, Department of Anesthesiology, Birmingham, AL, September 16, 1996. Lectures: "Value Based Anesthesia: The Academic Experience" and "Management Controversies for Cardiac Patients Undergoing Non-cardiac Surgery"

St. John's Hospital, Queens, NY, September 30, 1996.

Addressed regional gathering of anesthesiologists, Ritz-Carlton Hotel, Boston, MA, May 19, 1996.

Addressed regional gathering of anesthesiologists, The Plaza Hotel, New York, NY, June 9, 1996.

Addressed regional gathering of anesthesiologists, Baltimore, MD, June 30, 1996.

American Association of Nurse Anesthetists national meeting to discuss practice and reimbursement issues when CRNAs and anesthesiologists are working together, Rosemont, IL, September 12, 1996

Visiting professorships, 1995

Baylor University Medical Center, Dallas, TX, September 20, 1995.

Mercy Hospital, Pittsburgh, PA, November 1, 1995.

Visiting Professor, University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, New Brunswick, NJ, November 8, 1995. Lecture: "Management Controversies for the Patient at Risk for Myocardial Ischemia Undergoing Non-cardiac Surgery"

Visiting professorships, 1994

Deaconess Hospital, Boston, MA

Maine Medical Center, Department of Anesthesiology, Portland, ME, August 4, 1994.

Bronx–Lebanon Hospital Center, Department of Anesthesiology, Bronx, NY, November 30, 1994.

Visiting professorships, 1993

New York University Medical Center, New York, NY

Massachusetts General Hospital, Cardiac Division, Boston, MA

University of Medicine and Dentistry of New Jersey, Newark, NJ

Wake Medical Center, Raleigh, NC

Saint Barnabas Hospital, Livingston, NJ

Sutter Hospital, Sacramento, CA

Christiana Hospital, Wilmington, DE

Brandywine Regional Medical Center, Coatesville, PA

Englewood Hospital, Englewood, NJ

Non-physician presentations, 2001

Draeger Global Management Team Meeting, at the R. David Thomas Center of the Fuqua School of Business, Duke University, February 1, 2001. Presentation: "The Value of Information Technology."

Chair, Roche Pharmaceuticals, Advisory panel on PONV, Miami FL Dec 2001. "Understanding the pharmacoencomics of PONV agents"

Pain Management Advisory Board, Pfizer/Pharmacia

Non-physician presentations, 2000

Chair, Pharmacoeconomic Council on Neuromuscular Blocking Agents Retreat, Organon, Inc., St. Thomas, VI, May 19-21, 2000

Remifentanil Advisory Board, Abbott Laboratories, Chicago, IL, May 12-13

Vertebrae Medical Advisory Board (an Internet company to support web-medicine), Westchester, NY, May 12

Cox-II/Parecoxib – U.S. Health Outcomes Advisory Group Meeting, Searle, Chicago, IL, April 24-25

Dexmedetomidine Advisory Panel, Abbott Laboratories, Aventura, FL, March 3-5

Trainer, Abbott Laboratories Perioperative Services Meeting, Dallas, TX, February 6

AnesthesiaWeb Position Strategy Meeting, New York, NY, January 12.

Other presentations, 1998

"The Impact of Inhalation Agents on Global Cost," Cog Hill Golf and Country Club, Lemont, IL, September 4, 1998.

Addressed the North American Dräger national sales meeting, Philadelphia, PA, March 29, 1998. Lecture: "Anesthesia Information Systems of the New Millennium."

Addressed the Abbott Laboratories national sales training meeting, Ft. Lauderdale, FL, February 3, 1998. Lecture: "The Economics of Postoperative Nausea and Vomiting."

Non-physician presentations, 1997

Addressed Abbott Laboratories national product development group, Chicago, IL, March 24, 1997. Lectures: "Types of Studies to Determine Cost Justification" and "Economic Trends and Issues in Health Care Related to Anesthesia."

Addressed Abbott Laboratories national sales training meeting, Chicago, IL, July 27–30, 1998. Lectures: "Clinical Implications of Package Insert Changes" and "Cost Perspectives: Low Flow Sevoflurane."

Non-physician presentations, 1996

Panama City, FL, March 6, 1996.

Addressed the Amidate® (etomidate) Advisory Board of Abbott Laboratories, meeting in Washington, DC, March 8, 1996. Lecture: "General Cost Concepts and Cost Justification for Etomidate"

Addressed the Abbott Laboratories Sevoflurane Speakers Development Meeting, Hotel Sofitel, Rosemont, IL, May 17–18, 1996. Lecture: "The Cost Justification for Sevoflurane."

Other presentations, 1994

Lectured at the Osler Anesthesiology Review Course, Ft. Lauderdale, FL, February 14–15, 1994. Lectures: "Trauma," "How to Take the Written Boards," "How to Take the Oral Boards," "Anesthesia for Carotid Endarterectomy," "A Comparison of Induction Agents," "Management Controversies," "Answering Strategies for the Oral Boards".

Other presentations, 1993

Lectured at the Osler Anesthesiology Review Course, Chicago, IL, August 9–14, 1993. Lectures: "Recovery Room," "Answering Strategies for the Board Exams," "The Induction Agent for the Boards," "Carotid Endarterectomy," "Pre-operative Evaluation I," "How to Take Board Exams," and "Pre-operative Evaluation II."

Lectured at the Osler Anesthesiology Review Course, Tampa, FL, January, 1993. Lecture: "How to Take the Oral Board Exam."

Editorial and review board positions:

1. Co - Editor-in-chief of Anesthesiology , the electronic anesthesia textbook on emedicine.com. Under construction.
2. AnesthesiaWeb, a World Wide Web site developed for the anesthesia community (accumulated 16,000 subscribers, the largest anesthesia e-magazine in the world), Chair, Editorial Board, October 1996–2002.
3. Journal of Clinical Anesthesia, Section Editor, Cost Containment and Operations Improvement, 1995–present.
4. **Lubarsky, DA**: Abstract Reviewer on Economics, Education and Patient Safety. 77th and 78th Annual IARS Congress, March 27 – 31, 2004
5. Journal of Clinical Monitoring and Computing, Section Editor, Information Systems, 1999-2002
6. Anesthesiology, Guest Reviewer, 1996–present.
7. Anesthesia and Analgesia, Guest Reviewer, 1991–present.
8. Cardiovascular and Thoracic Anesthesia Journal Club Journal – Section Editor, Vascular Anesthesia, 1996–1999.
9. Anesthesia Cost Containment bulletin board on the Internet, Coordinator and Initiator, 1995.
10. TranspOrt, Contributing Editor, 1993-1994.
11. Butterworths Publishing Company, Boston, Guest Reviewer of anesthesia texts, 1991–93.

TEACHING

Awards:

- Medical Student "Teacher of the Year" Award, 1990.
- Fuqua Scholar Award, 1999.

Teaching specialization:

- Mentor to cost effective care clerkship
- Annual advisee to multiple residents

Lectures for Fuqua School of Business Course "Informatics, the internet, and healthcare" Fall 2000, Term 1 (Course repeated with update Fall 2001, Term 1)

- "Informatics, The Internet and Healthcare: Introduction and Overview," August 28
- "IT Development and Value," "EMR Ideals and Recap," "Functionality of Other HIS," August 31
- "Resource Utilization Control Using Informatics Systems," September 4
- "The Medicalogic Business Model – ROI for EMR," Sept. 7
- "Introduction to The Internet," and B2B business exchanges September 11
- "MD2MD Texts, Journals, CME and Intellectual Property," September 14
- "The Regulatory Environment," September 18
- "Content Sites," Sept 21
- "Medical Care Over the Internet," Sept 28

Spring 2001, Term 3

- "Operations Management Seminar, Department of Operations: Healthcare and Management Science," March 5

University Lectures

University of Miami – School of Medicine Educational Lectures 2002

Duke University Medical Center Educational Lecture, 2001

- Resident Lecture: "How to Value Health Care."
- Medical Student 2nd year Medical Practice in Health Systems (MPS 206C.82) Lectures, "Understanding Cost Concepts in the Literature."

Duke University Medical Center Educational Lectures, 2000

- Resident Lecture: "Management Controversies for the Patient At-Risk for Myocardial Ischemia Undergoing Non-Cardiac Surgery."
- Medical Student 2nd year Medical Practice in Health Systems (MPS 206C.82) Lectures, "Understanding Cost Concepts in the Literature."

Duke University Medical Center Educational Lectures, 1999

- Anesthesiology Resident Lecture, "Contracts, Reimbursement, and Compliance Issues"
- CA-1 Resident Orientation Lecture, "PACU Issues and Transport"
- Medical Student 2nd year Medical Practice in Health Systems (MPS 206C.82) Lectures, "Understanding Cost Concepts in the Literature."

Duke University Medical Center Educational Lectures, 1998

- Medical Student 2nd year Medical Practice Health Systems Lecture, "Understanding Cost Concepts in the Literature"
- CA-1 Resident Orientation Lecture, "PACU Issues and Transport"
- Resident Lecture, "Preparing for the Oral Boards"
- Medical Student 2nd year Medical Practice Health Systems Lecture, "Understanding Cost Concepts in the Literature"
- Resident and Residency Graduate All-day Seminar, "Preparing for the Anesthesia Orals"

Duke University Medical Center Educational Lectures, 1997

- Grand Rounds, "Relational Databases, Benchmarking, Practice Guidelines and Other Buzzwords of the New Millennium"
- Anesthesiology Resident Lecture, "Understanding Cost Concepts in the Literature: Part 2"
- Medical Student 2nd year Medical Practice Health Systems Lecture, "Understanding Cost Concepts in the Literature"
- Anesthesiology Resident Lecture, "Understanding Cost Concepts in the Literature: Part 1"
- Resident Lecture, "Controversies in Care of the Patient with Coronary Artery Disease for Non-cardiac Surgery"
- Resident and Residency Graduate Weekend Seminar, "Preparing for the Anesthesia Orals"
- Medical Student 2nd year Medical Practice Health Systems Course (previously called the Cost-Effective Care Clerkship), Lecture, "Understanding Cost Concepts in the Literature"
- Resident Lecture, "Common PACU Problems"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- CRNA Staff Meeting Presentation, "New Medicare Teaching Physician Rules: How They Affect the Anesthesia Care Team"
- Resident and Residency Graduate Weekend Seminar, "Preparing for the Anesthesia Orals"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"

Duke University Medical Center Educational Lectures, 1996

- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Resident and Residency Graduate Weekend Seminar, "Preparing for the Anesthesia Orals"
- Resident Lecture, "Common Problems and Decision Making"
- Departmental Grand Rounds, "Morbidity and Mortality"

- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Departmental Grand Rounds, with Dr. JG Reves, Department Chairman, "The New HCFA (Medicare) Guidelines"

- Resident lecture, "New Medicare Teaching Rules--How They Affect You, the Resident." (Short presentation followed by Question & Answer Session on the Introduction of New Departmental Policies)
- Departmental Grand Rounds, "Cost Containment"
- Resident Lecture, "Preoperative Evaluation of the Cardiac Patient for Non-Cardiac Surgery"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Critical Care Grand Rounds, "Cost Containment in the ICU"

Duke University Medical Center Educational Lectures, 1995

- Medical Student 2nd year Cost Effective Care Clerkship Tutorial Sessions
- Anesthesiology Resident Lecture, "Common Problems in Anesthesia"
- Medical Student 2nd year Cost Effective Care Clerkship Lecture, "Understanding Cost Concepts in the Literature"
- Anesthesiology Resident Lecture, "Common Problems in Anesthesia"
- Grand Rounds in Family Medicine, "Understanding Cost Concepts in the Literature"
- Anesthesiology Resident Lecture, "Board Review"
- Medical Student 2nd year Anesthesiology Rotation Lecture, "Hemodynamic Monitoring"

Duke University Medical Center Educational Lectures, 1994

- Current Topics in Vascular & Thoracic Anesthesia (CME Category 1 departmental conference), "Prevention of Endotracheal Tube-Induced Coughing During Emergence from General Anesthesia" with Dr. Daryl Malak
- CA-1 Resident Orientation Lecture, "Recovery Room Problems (& Transport): Basic Clinical Problem Solving"
- Current Topics in Vascular & Thoracic Anesthesia (CME Category 1 departmental conference), "Infection Control in Anesthesia" with Dr. Josef Grabmayer
- Anesthesiology Resident Lecture (Vascular & Thoracic Series), "Management Controversies for the Patient at Risk for Myocardial Ischemia Undergoing Non-cardiac Surgery"
- Current Topics in Vascular & Thoracic Anesthesia (CME Category 1 departmental conference), "Cell Saver: To Use or Not to Use?" with Dr. Nancy Knudsen

National board review courses (Invited lectures given multiple times 1991–1995):

"How to Take the Oral Board Exam"
"Carotid Endarterectomy"
"Oral Exam Answering Strategies"
"Pre-operative Evaluation—History and Physical Exam"
"Pre-operative Evaluation—Labs and Tests"
"Written Questions and Answers"
"Recovery Room—Differential Diagnoses and Therapies for Common Clinical Problems"
"Induction Agents for the Boards"
"Trauma Anesthesia"

SERVICE

Committees and offices:

Florida Society of Anesthesiologists:
FSA Board Member 2003
Ad hoc non-voting Board invitee 2002 – 2003

American Society of Anesthesiologists (ASA)
ASA Delegate for FSA, 2003
Committee on Economics 2003- present
Committee on Information Management 2002-3
Committee on Electronic Media and Information Technology, 2001-2.
Committee on Value Based Anesthesia Care 1995-1999
Task Force on Value-Based Anesthesia 1994 – 1995
Ad Hoc Committee on Health Outcomes in Anesthesia, chaired by Alex Macario, M.D., M.B.A. (October, 1997 – present)

University of Miami-School of Medicine
Chair, Department of Anesthesiology overseeing 25MM annual budget, 300 employees including 130 interns, residents and fellows, the largest training program in the world.
Medical Center Internet Group Chief Search 2002-2003
Governing Board 2001-present

Duke University Medical Center and Health System
Duke University Hospital, Perioperative Executive Committee, 2000 - 2002.
Duke University Health System/Duke University Medical Center Internet Advisory Committee, 2000 – 2002.
Managed Care Committee (PDC = Private Diagnostic Clinic = 850 MD paratnerhsip) and PDC representative to Managed Care Coordination Group (Duke University Health System and PDC) 2001-2002.
Private Diagnostic Clinic Business Strategy Committee, 1999 – 2002.
Steering Committee, Duke University Health System Revenue Management Initiative, October, 1999 - 2002.
Organizer, Duke University Medical MBA's (an internal consulting group for the Duke University Health System), 1999.
Physician Co-Director, Private Diagnostic Clinic (HCFA/CMS) Compliance Committee, March, 1997 - 2002.
Administration and Citizenship Work Group, managed by Provider Transition Strategies, LLC, charged with implementing a physician performance improvement system within the Duke Health System, February, 1998 – February, 1999.
Perioperative Services Advisory Committee, 1997 – 2002.
Faculty of Medical School cost-effective care course, 1995 – 2002.
Private Diagnostic Clinic Retirement Trust Plan Committee, representing the Departments of Anesthesiology, Pathology, Radiation Oncology and Radiology, 1995 – 2002.
Product Standardization Committee, Departmental Representative, May, 1995 – 1996.
Medical Center Cost Effectiveness Committee, January, 1995 – 2002.
Task Force on Teaching Cost Effectiveness, April, 1994 – June, 1995.

Duke Hospital Operations Improvement Steering Committee, 1994 – 1996.
Operating Room Mission Statement Committee, 1994.
Pharmacoeconomics Committee, 1994.

Liaison to Operating Room Clinical Laboratories, 1994 – 2002.
Task Force to Choose Managed Care Partners, 1994.
Duke University Medical Center, Hospital Budget Advisory Committee and Capital Equipment Committee, 1991 – 1994.

Duke Department of Anesthesiology
Chairman, Finance Committee, January, 1991–2002.
Chairman, Equipment, Supplies, and Product Standardization Committee, 1996–2002.
Coordinator, Practice Guidelines Development, 1994–2002.
Coordinator, Drug Utilization Review, 1995–2002.
Director, Outside Hospital Anesthesia Service Contracts, 1996–2002.
Physician Director of Reimbursement Analysts, 1996–2002.
Departmental Compliance Officer
Developer of departmental wide staffing model & incentive plans
Direct supervision of business office and business manager
Chief, Division of General/Vascular/Transplant Anesthesia and Surgical Critical Care Medicine (12 attendings, 10 CRNAs, 2-4 residents, 2-4 fellows, 8 PA's in preop screening unit) 1998-2002
Coordinator/creator, Current Topics in Vascular and Thoracic Anesthesia, a weekly CME Category 1 approved conference, July 1991–July 1998.
Director, Departmental Retreat, July 1994, "Upping the Pace of ACE (Anesthesia Cost Effectiveness)".
Resident Education Committee, 1991–1994.
Director, Mock Oral Board Review Course, 1989–2002.

APPENDIX A

ELECTRONIC, WORLD WIDE WEB AND/OR INTERNET PUBLICATIONS:
List of all literature reviews done for AnesthesiaWeb (http://www.anesthesiaweb.com)

1. Literature review: Dexter F et al: Decreases in anesthesia-controlled time cannot permit one additional surgical operation to be reliably scheduled during the workday. Anesth Analg 81:1263–8, 1995 in AnesthesiaWeb, November, 1996

2. Literature review: Dexter F and Tinker J: Analysis of strategies to decrease postanesthesia care unit costs. Anesthesiology 82:94–101, 1995 in AnesthesiaWeb, November, 1996

3. Literature review: Connors AF Jr et al: The effectiveness of right heart catheterization in the initial care of critically ill patients. JAMA 276:889–97, 1996 and the accompanying editorial: Should a moratorium be placed on sublingual nifedipine capsules for hypertensive emergencies and pseudoemergencies. JAMA 276:1328 in AnesthesiaWeb, December, 1996

4. Literature review: Mangano et al: Review of effect of atenolol on mortality and cardiovascular morbidity after noncardiac surgery. N Engl J Med 335:1713, 1996 and accompanying editorial, Eagle and Froelich: Reducing cardiovascular risk in patients undergoing noncardiac surgery. N Engl J Med 335(23):1761, 1996 in AnesthesiaWeb, January 1997

5. Literature review: Katz SG and Kohl RD: Selective use of the intensive care unit after nonaortic arterial surgery. J Vasc Surg 24:235–9, 1996 in AnesthesiaWeb, February, 1997

6. Literature review: Wright I et al: Statistical modeling to predict elective surgery time. Anesthesiology 85:1235–45, 1996 in AnesthesiaWeb, February, 1997

7. Literature review: Twersky R et al: What happens after discharge? Return hospital visits after ambulatory surgery. Anesth Analg 1997;84:319–24 in AnesthesiaWeb, March, 1997

8. Literature review: Blum U et al: Endoluminal stent grafts for infrarenal abdominal aortic aneurysms. N Engl J Med 1997;336:13–20 in AnesthesiaWeb, March, 1997

9. Literature review: Claxton AR, et al: Evaluation of morphine versus fentanyl for postoperative analgesia after ambulatory surgical procedures. Anesth Analg 1997; 84:509–514 in AnesthesiaWeb, April 1997

10. Literature review: Valenzuela RC, Johnstone RE: Cost containment in anesthesiology: a survey of department activities. J Clin Anesth 1997; 9:91–92 in AnesthesiaWeb, April 1997

11. Literature review: Rotondi AJ, et al: Benchmarking the perioperative process. I. Patient routing systems: A method of patient flow and resource utilization. J Clin Anes 1997; 9:159–169 in AnesthesiaWeb, May 1997

12. Literature review: Woolhandler S, Himmelstein DU: Costs of care and administration at for-profit hospitals and other hospitals in the United States. N Engl J Med 1997;336:769–774 in AnesthesiaWeb, May 1997

13. Literature review: Frank SM, et al: Perioperative maintenance of normothermia reduces the incidence of morbid cardiac events: a randomized clinical trial. JAMA 1997;277:1127–1134 in AnesthesiaWeb, June 1997

14. Literature review of a 3-article series: Part 1. Russell LB, et al: The role of cost-effectiveness analysis in health and medicine. JAMA 1996; 276:1172–1177
Part 2. Weinstein MC, et al: Recommendations of the Panel on Cost-Effectiveness in Health and Medicine. JAMA 1996;276:1253–1258
Part 3. Siegel JE, et al: Recommendations for reporting cost-effectiveness analyses. JAMA 1996;276:1339–1341
all reviewed in AnesthesiaWeb, July 1997

15. Literature review: Kharasch ED, et al: Assessment of low-flow sevoflurane and isoflurane effects on renal function using sensitive markers of tubular toxicity. Anesthesiology 1997; 86:1238–1253 and accompanying editorial, Mazze RI, Jamison RL: Low-flow (1 l/min sevoflurane): is it safe? Anesthesiology 1997;86:1225–7 in AnesthesiaWeb, August 1997

16. Literature review: Bito H, et al: Effects of low-flow sevoflurane anesthesia on renal function: comparison with high-flow sevoflurane anesthesia and low-flow isoflurane anesthesia. Anesthesiology 1997; 86:1231–1237 in AnesthesiaWeb, August 1997

17. Literature review: Kearon C, Hirsh J: Management of anticoagulation before and after elective surgery. N Engl J Med 1997; 336:1506–1511 in AnesthesiaWeb, September 1997

18. Literature review: Rooke GA, et al: Hemodynamic response and change in organ blood volume during spinal anesthesia in elderly men with cardiac disease. Anesth Analg 1997;85:99–105 in AnesthesiaWeb, September 1997

19. Literature review: Ballantyne JC, Chang Y: The impact of choice of muscle relaxant on postoperative recovery time: A retrospective study. Anesth Analg 1997;85:476–82 in AnesthesiaWeb, October 1997

20. Literature review: Caldwell JE: The problem with long-acting muscle relaxants? They cost more! Anesth Analg 1997;85:473–475 in AnesthesiaWeb, October 1997

21. Literature review: Snaidach MS, Alberts MS: A comparison of the prophylactic antiemetic effect of ondansetron and droperidol on patients undergoing gynecologic laparoscopy. Anesth Analg 1997; 85:797–800 in AnesthesiaWeb, December, 1997

22. Literature review: Vogt AW, Henson LC: Unindicated preoperative testing: ASA physical status and financial implications. J Clin Anes 1997; 9:437–441 in AnesthesiaWeb, December, 1997

23. Literature review: Lee TH, Cooper HL: Translating good advice into better practice. (editorial) JAMA 1997;278:2108-2109 and Stiell IG, et al: Implementation of the Ottawa Knee Rule for the use of radiography in acute knee injuries. JAMA 1997;278:2075-2079 in AnesthesiaWeb, February, 1998

24. Literature review: Pierce ET, et al: Anesthesia type does not influence early graft patency or limb salvage rates of lower extremity arterial bypass. J Vasc Surg 1997;25:226-233 in AnesthesiaWeb, February, 1998

25. Literature review: Olsen MF et al: A randomized controlled trial of prophylactic chest physiotherapy in major abdominal surgery. Br J Surg 1997; 84:1535–1538 in AnesthesiaWeb, April, 1998

26. Literature review: Pollard JB, et al: Use of outpatient preoperative evaluation to decrease length of stay for vascular surgery. Anesth Analg 1997;85:1307–11 in AnesthesiaWeb, April, 1998

27. Literature review: Cher DJ, Lenert LA: Method of Medicare reimbursement and the rate of potentially ineffective care of critically ill patients. JAMA 1997;278:1001–1007 in AnesthesiaWeb, May, 1998

28. Literature review: O'Connor PG, Kosten TR: Rapid and ultrarapid detoxification techniques. JAMA 1998;279:229–234 in AnesthesiaWeb, May, 1998

29. Literature review: Badner NH, et al: Myocardial infarction after noncardiac surgery. Anesthesiology 1998;88:572–578 in AnesthesiaWeb, July, 1998

30. Literature review: Overdyk FJ, et al: Successful strategies for improving operating room efficiency at academic institutions. Anesth Analg 1998;86:896–906 in AnesthesiaWeb, July, 1998

31. Literature review: Leung JM, et al: Automated electrocardiograph ST segment trending monitors: Accuracy in detecting myocardial ischemia. Anesth Analg 1998; 87:4–10 in AnesthesiaWeb, August, 1998

32. Literature review: Swamidoss CP, et al: Health-care report cards and implications for anesthesia. Anesthesiology 1998; 88:809–819 in AnesthesiaWeb, August, 1998

33. Literature review: Fortney JT, et al: A comparison of the efficacy, safety, and patient satisfaction of ondansetron versus droperidol as antiemetics for elective outpatient surgical procedures. Anesth Analg 1998;86:731-8 in AnesthesiaWeb, September, 1998

34. Literature review: Vitez TS and Macario A: Setting performance standards for an anesthesia department. J Clin Anesth 1998;10:166–75 in AnesthesiaWeb, February, 1999

35. Literature review: Fleisher LA and Barash PG: Percutaneous transluminal coronary angioplasty before noncardiac surgery: current state of the debate. (editorial) J Cardiothorac Vasc Anesth 1998;12:499–500 in AnesthesiaWeb, February, 1999

36. Literature review: Bennett-Guerrero E, et al. The use of postoperative morbidity survey to evaluate patients with prolonged hospitalization after routine, moderate-risk, elective surgery. Anesth Analg 1999;89:514–519 in AnesthesiaWeb, October, 1999

37. Literature review: Posner KL, Freund PR: Trends in quality of anesthesia care associated with changing staffing patterns, productivity, and concurrency of case supervision in a teaching hospital. Anesthesiology 1999; 91:839-47 in AnesthesiaWeb, January, 2000

38. Literature review: Prielipp RC, et al: Ulnar nerve pressure: influence of arm position and relationship to somatosensory evoked potentials. Anesthesiology 1999; 91:345-54 with editorial Caplan RA: Will we ever understand perioperative neuropathy? A fresh approach offers hope and insight. Anesthesiology 1999; 91:335-6 in AnesthesiaWeb, January 2000

39. Literature review: Ramsey SD, Saint S, Sullivan SD et al: Clinical and economic effects of pulmonary artery catheterization in nonemergent coronary artery bypass graft surgery. J Cardiothorac Vasc Anesth 14(2) April 2000 113-118, in AnesthesiaWeb, June 2000

40. Literature review: Johnstone RE, Hosaflook C: Financial impact if payers use Medicare rates. Anesthesiology 2000; 93:852-7 in AnesthesiaWeb, October 2000

41. Literature review: Tobias JD: Fenoldopam: Applications in anesthesiology, perioperative medicine, and critical care medicine. Am J Anesthesiology 2000; 27(7):395-401 in AnesthesiaWeb, December 2000

APPENDIX B
EDITORIALS ACCOMPANYING ARTICLES:
(Numbers refer to the article listed on Lubarsky's CV)

15 & 16. Shapiro BA: Why must the practice of anesthesiology change? It's economics, Doctor! Anesthesiology 86:1020-1022, 1997 and
Fisher DM, Macario A: Economics of anesthesia care. A call to arms! Anesthesiology 86:1018-1019, 1997

20. Miller RD, Rampil L, Cohen N: Fewer residents: financial, educational, and practical implications. Anesth Analg 87:242-244, 1998

23. Mazzei WJ: Maximizing operating room utilization: a landmark study. Anesth Analg 89:1-2, 1999

26. Chestnut DH: How do we measure (the cost of) pain relief? Anesthesiology 92:643-645, 2000

27. Watcha MF: The cost-effective management of postoperative nausea and vomiting. Anesthesiology 92:931-3, 2000

Exhibit 2 to Dr. Lubarsky's Affidavit

Post-it® Fax Note 7671	Date 6-19	# of pages ▶ 1
To D. Inglis	From R Bell	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

CHRONOLOGICAL EXECUTION REPORT

NAME OF INMATE: ROBERT COE 92166

		Time
1.	Inmate entered execution room	1:07 AM
2.	Restraints in place on inmate	1:09 AM
3.	IV systems in place	1:21 AM
4.	Lethal injection chemicals injected	1:32 AM
5.	Examined by physician	1:36 AM
6.	Pronounced dead	1:37 AM
7.	Body removed	
8.	Body removed from institution	

4-19-00
Date

Warden

5

Exhibit 3 to Dr. Lubarsky's Affidavit

DAY OF EXECUTION - LETHAL INJECTION EXECUTION RECORDER CHECKLIST

Inmate Name Phillip Workman Inmate # 95920

Date 5/8 & 5/9/07

TIME	
_____	Report to designated area for final briefing
11:00 pm	Extraction Team and IV Team report to Administrative Lieutenants office. IV Team sets up IV system.
12:00	Physician in place
11:05	IV Team in place (EMTs and Officers)
11:50	Medical Examiner in place
10:45	Team Leader in place
10:50	Check blinds and curtains
12:09	Advise Escort Officer to transport Official Witnesses to Parole Room
12:12	Advised by Escort Officer that Official Witnesses are in Parole Room
1:02am	Advise Escort Officers (2) to escort Victim's Witnesses to Viewing Room
1:03am	Advised by Escort Officers (2) that Victim's Witnesses are in place
1:20	Warden or designee checks to ensure execution is to proceed
1:00	Gurney positioned in Death Watch Area
1:00	Extraction Team enters and secures offender to gurney
12:59	Advise Escort Officer to transport Official Witnesses to Death Watch vestibule
1:01	Advised by Escort Officer that Official Witnesses are in the vestibule
1:08	IV Team enters the Execution Chamber
1:20	IV Team exits the Execution Chamber
1:05	Advise Escort Officer to "Transport Official Witnesses in place"

Recorder's Initial [redacted]

DAY OF EXECUTION – LETHAL INJECTION EXECUTION RECORDER CHECKLIST (continued)

Inmate Name Phillip Workman Inmate # 95920

Date 5/8 & 5/9/07

TIME	
1:04	Advised by Escort Officer that "Witnesses are in place"
1:20	Warden checks with Command Center to proceed
1:20	Warden orders blinds opened, closed circuit TV activated and audio activated for viewing rooms.
1:21	Warden asks offender for any last comments
1:21	Warden orders Execution Team to proceed
1:31	Lethal Injection process completed
1:36	Blinds and curtains closed and closed circuit TV deactivated
1:37	Physician enters the Execution Chamber
1:38	Physician pronounces death – exact time
1:38	Audio deactivated to witness rooms
1:38	Advise Escort Officers (2) to remove Victims Witnesses
1:39	Advise Commissioner or designee in Command Center that execution is completed
1:50	Physician and EMTs depart
1:40	Medical Examiner escorted to chamber to take possession of body. Pictures will be taken of body and Execution Chamber prior to removal of body
1:42	Advised by Escort Officer (2) Victims Witnesses are at Checkpoint
1:44	Advise Escort Officer to remove Official Witnesses
1:47	Advised by Escort Officer that Official Witnesses are at Checkpoint
1:50	The body removed from the institution

Recorder's Initial [redacted]

DAY OF EXECUTION - LETHAL INJECTION EXECUTION RECORDER CHECKLIST (continued)

Inmate Name Phillip Workman Inmate # 95920

Date 5/8 + 5/9/07

Offender's Comments if any:

I pray to Jesus Christ not to charge my death to any man. I bring my spirit to you sir, Jesus Christ.

[redacted]
Lethal Injection Recorder

5/9/07
Date

Warden

5/9/07
Date

May 9, 2007

Last statement of Phillip Workman:

"I pray to Jesus Christ not to charge my death to any man."

{Pause}

"I bring my spirit to you Sir, Jesus Christ."

LETHAL INJECTION CHEMICAL ADMINISTRATION RECORD

Inmate Name WORKMAN Inmate #_____

Date_____

SET 1 (Red)	Drug	Time Begin
Syringe 1	Sodium Thiopental	1:21 AM
Syringe 2	Sodium Thiopental	1:23 AM
Syringe 3	Sodium Thiopental	1:24 AM
Syringe 4	Sodium Thiopental	1:25 AM
Syringe 5	Saline	1:26 AM
Syringe 6	Pancuronium Bromide	1:27 AM
Syringe 7	Pancuronium Bromide	1:28 AM
Syringe 8	Saline	1:29 AM
Syringe 9	Potassium Chloride	1:29 AM
Syringe 10	Potassium Chloride	1:30 AM
Syringe 11	Saline	1:30 AM

End Time 1:31 AM

Recorder Signature [redacted]

Warden Ricky F Bell

RED

CHEMICAL PREPARATION TIME SHEET

Date 5/8/07

5 grams Sodium Thiopental Mixed

Time

4-Syringes prepared by [redacted] at 10:55 pm

Witnessed by [redacted]

100 mg Pancuronium Bromide (1mg/ml)

2-Syringes prepared by [redacted] at 11:07 pm

Witnessed by [redacted]

100 mL of 2 mEq/mL Potassium Chloride, for a total of 200 mEq

2-Syringes prepared by [redacted] at 11:14 pm

Witnessed by [redacted]

Saline

3-Syringes prepared by [redacted] at 11:16 pm

Witnessed by [redacted]

CHEMICAL PREPARATION TIME SHEET

Blue

Date 5/8/07

5 grams Sodium Thiopental Mixed

Time

4-Syringes prepared by [redacted] at 11:43 P

Witnessed by [redacted]

100 mg Pancuronium Bromide (1mg/ml)

2-Syringes prepared by [redacted] at 11:50p

Witnessed by [redacted]

100 mL of 2 mEq/mL Potassium Chloride, for a total of 200 mEq

2-Syringes prepared by [redacted] at 11:54p

Witnessed by [redacted]

Saline

3-Syringes prepared by [redacted] at 11:56p

Witnessed by [redacted]

Exhibit 4 to Dr. Lubarsky's Affidavit

DAY OF EXECUTION – LETHAL INJECTION EXECUTION RECORDER CHECKLIST

Inmate Name Steve Henley Inmate # 109572

Date February 4, 2009

TIME	
10:00	Report to designated area for final briefing
10:30	Extraction Team and IV Team report to Administrative Lieutenants office. IV Team sets up IV system.
11:45	Physician in place
11:00	IV Team in place (EMTs and Officers)
11:30	Medical Examiner in place
11:00	Team Leader in place
12:30	Check blinds and curtains
12:45	Advise Escort Officer to transport Official Witnesses to Parole Room
12:46	Advised by Escort Officer that Official Witnesses are in Parole Room
12:30	Advise Escort Officers (2) to escort Victim's Witnesses to Viewing Room
12:31	Advised by Escort Officers (2) that Victim's Witnesses are in place
_____	Warden or designee checks to ensure execution is to proceed.
1:02	Gurney positioned in Death Watch Area
1:03	Extraction Team enters and secures offender to gurney
1:04	Advise Escort Officer to transport Official Witnesses to Death Watch vestibule
1:06	Advised by Escort Officer that Official Witnesses are in the vestibule
1:09	IV Team enters the Execution Chamber
1:16	IV Team exits the Execution Chamber
_____	Advise Escort Officer to "Transport Official Witnesses in place"

Recorder's Initial [redacted]

DAY OF EXECUTION – LETHAL INJECTION EXECUTION RECORDER CHECKLIST (continued)

Inmate Name Steve Henley Inmate # 109572

Date February 4, 2009

TIME	
_____	Advised by Escort Officer that "Witnesses are in place"
1:17	Warden checks with Command Center to proceed
1:17	Warden orders blinds opened, closed circuit TV activated and audio activated for viewing rooms.
1:17	Warden asks offender for any last comments
1:19	Warden orders Execution Team to proceed
1:26	Lethal injection process completed
1:31	Blinds and curtains closed and closed circuit TV deactivated
1:32	Physician enters the Execution Chamber
1:33	Physician pronounces death – exact time
1:33	Audio deactivated to witness rooms
1:34	Advise Escort Officers (2) to remove Victims Witnesses
1:34	Advise Commissioner or designee in Command Center that execution is completed
1:50	Physician and EMTs depart
1:34	Medical Examiner escorted to chamber to take possession of body. Pictures will be taken of body and Execution Chamber prior to removal of body
1:34	Advised by Escort Officer (2) Victims Witnesses are at Checkpoint
1:34	Advise Escort Officer to remove Official Witnesses
1:43	Advised by Escort Officer that Official Witnesses are at Checkpoint
1:50	The body removed from the institution

Recorder's Initia[redacted]

DAY OF EXECUTION - LETHAL INJECTION EXECUTION RECORDER CHECKLIST (continued)

Inmate Name Steve Henley Inmate # 109572

Date February 4, 2009

Offender's Comments if any:

I'd like to say that I hope this gives Fred + Edna's family some peace. This never does anybody any good. I'm sorry for what Fred + Edna went through. All my love goes out to my children and my family. I am an innocent man.

[redacted]
Lethal Injection Recorder

2/4/09
Date

Warden

2/4/09
Date

LETHAL INJECTION CHEMICAL ADMINISTRATION RECORD

Inmate Name STEVE HENLEY Inmate # 109572

Date 2-4-09

SET 1 (Red)	Drug	Time Begin
Syringe 1	Sodium Thiopental	1:19 AM
Syringe 2	Sodium Thiopental	1:20 AM
Syringe 3	Sodium Thiopental	1:20 AM
Syringe 4	Sodium Thiopental	1:21 AM
Syringe 5	Saline	1:22 AM
Syringe 6	Pancuronium Bromide	1:22 AM
Syringe 7	Pancuronium Bromide	1:23 AM
Syringe 8	Saline	1:23 AM
Syringe 9	Potassium Chloride	1:24 AM
Syringe 10	Potassium Chloride	1:24 AM
Syringe 11	Saline	1:25 AM

End Time 1:25 AM

Recorder Signature [redacted]

Warden Ricky E Bell

CHEMICAL PREPARATION TIME SHEET

RED

Date 2-3-09

5 grams Sodium Thiopental Mixed — Time

4-Syringes prepared by [redacted] at 10:02 PM

Witnessed by [redacted]

100 mg Pancuronium Bromide (1mg/ml)

2-Syringes prepared by [redacted] at 10:30PM

Witnessed by [redacted]

100 mL of 2 mEq/mL Potassium Chloride, for a total of 200 mEq

2-Syringes prepared by [redacted] at 10:39PM

Witnessed by [redacted]

Saline

3-Syringes prepared by [redacted] at 10:41 PM

Witnessed by [redacted]

CHEMICAL PREPARATION TIME SHEET

BLUE

Date 2-3-09

5 grams Sodium Thiopental Mixed — Time

4-Syringes prepared by [redacted] at 10:53 PM

Witnessed by [redacted]

100 mg Pancuronium Bromide (1mg/ml)

2-Syringes prepared by [redacted] at 11:02 PM

Witnessed by [redacted]

100 mL of 2 mEq/mL Potassium Chloride, for a total of 200 mEq

2-Syringes prepared by [redacted] at 11:14 PM

Witnessed by [redacted]

Saline

3-Syringes prepared by [redacted] at 11:15 PM

Witnessed by [redacted]

Exhibit 5 to Dr. Lubarsky's Affidavit

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE MEDICAL EXAMINER

84 HERMITAGE AVENUE; NASHVILLE, TN 37210-2110
(615) 862-8940

State #
County # 00-0956

REPORT OF INVESTIGATION BY COUNTY MEDICAL EXAMINER

DECEDENT: Robert G Coe RACE: White SEX: Male AGE: 44 Years

HOME ADDRESS: Riverbend Maximum Security 7475 Cockrill Bend Road; Nashville TN MARITAL STATUS: Single

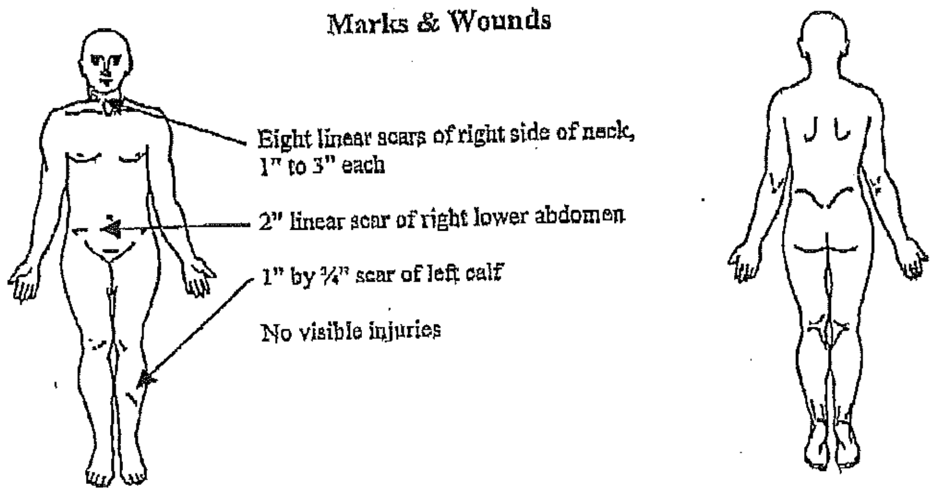
OCCUPATION: Prisoner SS#: DATE OF BIRTH: [redacted]1956

TYPE OF DEATH: Violent ( ) Casualty ( ) Suicide ( ) Suddenly when in apparent health ( )
Found Dead ( ) In Prison (•) Suspicious, unusual or unnatural ( ) Cremation ( )
Motor Vehicle Accident ( ) Check One Driver ( ) Passenger ( ) Pedestrian ( ) Unknown ( )
COMMENT: Death by lethal injection

AGENCY INVESTIGATOR AND COMPLAINT #: MEO

DESCRIPTION OF BODY: Clothed (•) Unclothed ( ) Partly Clothed ( ) Circumcised? (_)
Eyes: Brown Hair: Gray Mustache: Yes Beard: Yes
Weight: 179.5 (Lbs.) Length: 69 (In.) Body Temp: Warm to cool
Rigor? (•) Lysed? (_) Livor Color Purple Fixed? (_)

Marks & Wounds



Probable Cause of Death	Manner Of Death	Disposition Of Case
Acute intoxication by the combined effects of pentothal, pavulon and potassium	Accident ( ) Homicide (•) Suicide ( ) Natural ( ) Could Not Be Determined ( ) Pending Investigation ( ) Cremation Approved (_)	Medical Examiner Jurisdiction Refused (_) Autopsy Ordered (•) Toxicology (•) **0567** Responsible For Death Certificate: Medical Examiner(•) Bruce P. Levy, M.D. Other MD ( ) Funeral Home: Pettus-Owen-Wood FH

I hereby declare that after receiving notice of death described herein, I took charge of the body and made inquiries regarding the cause of death in accordance with Section 38-7-101-117 Tennessee Code Annotated and that the information contained herein regarding such death is true and correct to the best of my knowledge and belief.

April 19, 2000 — Date
DAVIDSON — County of Appointment
Signature of County Medical Examiner

13-1

Personal History: Suicide Attempts (_) Suicide Threats (_) Hobbies, aptitude and skills with firearms, chemicals, etc. (_) Domestic, premarital or marital conflicts (_) Financial or business reverses (_) Social or religious conflicts (_) Legal Difficulties (_) Criminal Record (_) Unemployment (_) Fear of disease (_)
Other (Specify):

Conduct Before Death: Efforts to prevent help (_) Efforts to obtain help (_) Suicide attempt: Admitted (_) Denied (_) Refused to (_) Written declaration of intended suicide (_) Accusations against others (_)
Other (Specify):

	Last Seen Alive	Injury or Illness	Death	Discovery	Medical Examiner Notified	View of Body	Police Notified
Date		04/19/2000	04/19/2000		04/19/2000	04/19/2000	
Time		01:20	01:37		00:00	01:45:00	

	Location	City or County	Type of Premises (hospital, hotel, highway, etc.)
Injury or onset of illness	Riverbend Maximum Security	Nashville	Prison
Death	Riverbend Maximum Security	Nashville	Prison
Viewing of body by Medical Examiner	Riverbend Maximum Security	Nashville	Prison

MEDICAL ATTENTION AND HOSPITAL, INSTITUTIONAL CARE OR HOME HEALTH CARE

Name of Physician or Institution	Address	Diagnoses	Dates

CIRCUMSTANCES OF DEATH

	Name	Address
Found Dead By		
Last Seen Alive By		
Witness to Injury or Illness	Ricky J. Bell, Warden	Riverbend Maximum Security;7475 Cockrill Bend Road Nashville TN 37243-
Witness to Death	Dr. Frank Thomas	
Next of Kin	Billie Mayberry (Sister)	[redacted] Trezevant TN 38258- [redacted]

(36) NARRATIVE SUMMARY OF CIRCUMSTANCES SURROUNDING DEATH

The decedent is a 44 y.o. W/M who executed by lethal injection on this date. A body examination was performed and documentation made with photography. The body was transported to the Forensic Science Center for further examination by the medical examiner and disposition to the funeral home.

Frances M. Wheatley
04/19/2000

0568

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
METROPOLITAN NASHVILLE DAVIDSON COUNTY
Office of Medical Examiner
Forensic Sciences Center
84 Hermitage Avenue
Nashville, Tennessee 37210-2110

CASE: MEC00-0956
County: DAVIDSON

AUTOPSY REPORT

NAME OF DECEDENT: COE, ROBERT GLEN RACE: W SEX: M AGE: 44

HOME ADDRESS: River Bend Maximum Security, Nashville TN

DATE AND TIME OF DEATH: April 19, 2000 at 1:37 a.m.

DATE AND TIME OF AUTOPSY: April 19, 2000 at 8:30 a.m.

COUNTY MEDICAL EXAMINER: Bruce P. Levy, M.D.

ADDRESS: 84 Hermitage Avenue, Nashville, TN 37210-2110

DISTRICT ATTORNEY GENERAL: Honorable Victor S. Johnson

ADDRESS: Washington Square, Suite 500, 222 2nd Avenue North, Nashville, TN 37201-1649.

PATHOLOGIC DIAGNOSES

1. Acute sodium pentothal, Pavulon (pancuronium bromide), and potassium chloride intoxication:
   a) Pulmonary edema (1840 grams together).
2. Atherosclerotic cardiovascular disease:
   a) Coronary artery atherosclerosis, focally marked.
   b) Aortic atherosclerosis, slight.
3. Left pleural fibrous adhesions, focal.
4. Status-post appendectomy, remote.

CAUSE OF DEATH:	Acute intoxication by the combined effects of pentothal, Pavulon and potassium.
MANNER OF DEATH:	Homicide.
CIRCUMSTANCES OF DEATH:	Judicial execution.

I hereby certify that I, Bruce P. Levy, M.D. have performed an autopsy on the body of Robert Glen Coe on the 19th day of April, 2000 at 8:30 am in the Forensic Sciences Center of Davidson County. The purpose of this report is to provide a certified opinion to the County Medical Examiner and District Attorney General. The facts and findings to support these conclusions are filed with the Tennessee Department of Health.

EXTERNAL EXAMINATION

The body is that of a well-developed, well-nourished white male, measuring 69 inches and weighing 179-1/2 pounds, whose appearance is consistent with the reported age of 44 years. Hair is gray with male pattern baldness, 1/2 inch in length. There is a mustache and full beard on the face. There is patchy blanching facial congestion. The irides are brown and the pupils are round. The sclerae are anicteric and the conjunctivae are pale without petechial hemorrhages. The ears, nose and mouth are unremarkable. There is blood-tinged liquid in the nasal and oral cavities. A full upper denture plate is in place. A partial lower denture plate is in place and lower natural teeth are in fair repair.

The anterior torso is symmetric with a protuberant soft abdomen. The posterior torso is unremarkable. The upper and lower extremities are symmetric and unremarkable. External genitalia are those of an uncircumcised male with descended testes.

Rigor mortis is moderate and symmetric. Livor mortis is purple in color, posterior in distribution, and blanching. The body is warm to cool to touch.

THERAPEUTIC PROCEDURES: Intravenous catheters are inserted into superficial blood vessels of both antecubital fossae. Attached to the intravenous catheter on the right is intravenous tubing and a bag of 0.9% normal saline. Attached the intravenous catheter on the left is intravenous tubing, a bag of 0.9% normal saline and a 60 cc. syringe containing a label "7." There is an additional dermal puncture of the right antecubital fossa.

SCARS: There are a series of eight linear scars on the right side of the neck, varying between 1 and 3 inch in length each. There is a 1 x 3/4 inch scar on the anterior/lateral aspect of the left calf. There is a 2 inch linear scar in the right lower quadrant of the abdomen. Subsequent examination revealed the absence of the vermiform appendix.

TATTOOS: On the lateral aspect of the right upper arm is a monochromatic tattoo of a peace sign and "Robert Coe." On the lateral aspect of the left upper arm is a monochromatic tattoo of a sword. On the left upper portion of the back is a monochromatic tattoo "kiss off."

INJURIES: None.

INTERNAL EXAMINATION

HEAD: The scalp is unremarkable without abrasions, contusions, or lacerations. The skull is intact without fractures. The meningeal coverings of the brain are intact without epidural, subdural, or subarachnoid hemorrhages.

The 1430 gram brain is symmetric with an unremarkable gyral pattern. The distribution of cranial nerves at the base of the brain is normal. The cerebral vessels are unremarkable and

normally distributed. Coronal sections through the cerebral hemispheres reveal a normal distribution of gray and white matter without focal lesions. The ventricles are of normal configuration and size. Horizontal sections through the cerebellum and brain stem reveal a normal distribution of gray and white matter without focal lesions.

NECK: There are no hemorrhages into the musculature or soft tissues of the neck. The hyoid, larynx, and trachea are intact without obstructions. The base of the tongue is unremarkable. The cervical vertebrae are palpably intact.

BODY CAVITIES: All organs are in their normal anatomic locations. The right pleural, pericardial, and peritoneal cavities are unremarkable. There are focal fibrous adhesions between the left pleura and the lower lobe of the left lung.

CARDIOVASCULAR SYSTEM: The great vessels are normally distributed without thromboemboli. There are slight atherosclerotic deposits of the aorta.

The 390 gram heart has a smooth, glistening, intact epicardial surface. The right-dominant coronary arteries contain slight to focally marked atherosclerotic deposits. There is a maximal 90 percent occlusion of the left main and left anterior descending arteries. The remainder of the coronary arteries contain less than 50 percent occlusion. The myocardium is homogeneous red-brown without focal lesions. The left and right ventricles are 1.1 and 0.2 cm. in thickness at the lateral walls, respectively, and symmetric. The endocardial surfaces and four cardiac valves are unremarkable. The mitral and tricuspid valves measure 10.3 and 11.0 cm. in circumference, respectively.

RESPIRATORY SYSTEM: The right and left lungs weigh 980 and 860 grams, respectively. The pleural surfaces are glistening and intact. The pulmonary arteries are free of thromboemboli. The bronchi contain frothy fluid, otherwise unremarkable. The parenchyma is pink to tan and fluffy with a moderate quantity of expressed frothy fluid. There are no focal lesions or consolidations.

DIGESTIVE SYSTEM AND LIVER: The esophagus is unremarkable with a sharp gastroesophageal junction. The unremarkable stomach contains approximately 400 ml of tan liquids and fragments of partially digested food including identifiable potato. The duodenum, small intestines and large intestines are unremarkable. The vermiform appendix is absent.

The 2340 gram liver has a smooth, intact capsule. The parenchyma is red-brown, congested and soft without focal lesions. The unremarkable gallbladder contains approximately 10 ml. of bile. The extrahepatic bile ducts are patent and unremarkable. The pancreas is unremarkable.

RETICULOENDOTHELIAL SYSTEM: The 190 gram spleen is unremarkable. There is a normal distribution of unremarkable lymph nodes.

GENITOURINARY SYSTEM: The kidneys weigh 180 grams each. The subcapsular surfaces are smooth. The cortices are of normal thickness with sharp corticomedullary junctions. The calices, pelves, and ureters are patent and unremarkable. The unremarkable urinary bladder contains approximately 120 ml of urine.

The testes, prostate gland and seminal vesicles are unremarkable.

ENDOCRINE SYSTEM: The pituitary, thyroid, parathyroid and adrenal glands are

unremarkable.

MUSCULOSKELETAL SYSTEM: The musculoskeletal system is intact and unremarkable.

TOXICOLOGY: The following specimens are submitted for possible toxicologic analysis: blood, bile, urine and vitreous humor. A separate report will be issued.

HISTOLOGY: The following specimens are submitted for histologic examination: left anterior descending coronary artery, heart, left bronchus, lungs, liver, spleen, kidney, pituitary gland, thyroid gland, adrenal gland and brain. A separate report will be issued.

SUMMARY OF CASE

This 44 year old male underwent a judicial execution by lethal injection.

At autopsy, there were no visible external or internal injuries. Gross examination revealed moderate pulmonary edema and focally marked atherosclerosis of the coronary arteries. Specimens were obtained for toxicology and histology studies.

Histology confirmed the gross pathologic findings. Blood levels of thiopental (sodium pentothal) and its metabolite pentobarbital are both within normal therapeutic concentrations. Blood levels of pancuronium (Pavulon) are well above the levels indicated for medical use.

In my opinion, this person died as a result of an acute combined intoxication by pentothal, Pavulon and potassium. The manner of death is homicide (judicial execution).

Signature _____ Date 8/10/00

Bruce F. Levy, M.D.
Chief Medical Examiner

BPL/lss
T: 04/20/00

OFFICE OF THE MEDICAL EXAMINER
FORENSIC MEDICAL

REPORT OF MICROSCOPICAL EXAMINATION

Name of Deceased: COE, ROBERT GLEN **MEC00-0956**

Date of Report: June 5, 2000

Left anterior coronary artery: There are complex atherosclerotic plaques with approximately 90 percent narrowing of the lumen. No thrombotic material is present in the lumen.

Heart: The epicardial surfaces are unremarkable. The myocardium shows slight reversible ischemic changes with hypereosinophilia of the cytoplasm and occasional wavy fiber forms. No significant inflammation or myocardial necrosis is identified. The endocardial surfaces are unremarkable.

Left bronchus: Unremarkable.

Lungs: There is vascular congestion in dependent segments. The pulmonary vasculature is otherwise unremarkable. The bronchi are unremarkable. Alveoli show variably atelectatic and hyper expanded segments with scattered large dilated airspaces. Alveolar walls are thin and delicate without significant inflammation. Alveoli contain numerous macrophages with golden-brown granular cytoplasmic deposits.

Liver: Hepatocytes contain a granular amphophilic cytoplasm with scattered clear cytoplasmic vacuoles and scattered golden-brown granular cytoplasmic deposits. Portal areas are unremarkable. There is slight vascular congestion of the hepatic sinusoids, otherwise unremarkable.

Spleen: Red and white pulp are unremarkable. White pulp follicles contain rare active germinal centers.

Kidney: Glomeruli and tubules are unremarkable. There is vascular congestion.

Pituitary gland: Unremarkable.

Thyroid gland: Unremarkable.

Adrenal gland: Unremarkable.

Brain: Sections of the cerebral cortex, hippocampus, cerebellum and brainstem are unremarkable. There are no ischemic, inflammatory or neoplastic changes.

BRUCE P. LEVY, M.D.

0574

AEGIS
ANALYTICAL LABORATORIES, INC
345 HILL AVENUE, NASHVILLE, TN 37210
Telelphone: (615) 255-2400 ■ Facsimilie: (615) 255-3030

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 1 of 1
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 07/14/00 10:47

CLIENT # : 00-0956
AEGIS # : 278285
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(42197) VITREOUS ELECTROLYTE PANEL

****

Specimen submitted was analyzed for the seven analytes listed below. Conventional clinical chemistry and/or microelctrode analytical methods were applied in performing these analyses. Specimen will be retained for 366 days after the date of this report.

Glucose
BUN
Sodium
Potassium
Chloride
CO2
Creatinine

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Vitreous

TEST RESULTS: POSITIVE

Glucose: 34 mg/dL

Blood Urea Nitrogen(BUN): 10 mg/dL

Sodium(Na): 160 mmol/L

Potassium(K): 9 mmol/L

Chloride(Cl): 92 mmol/L

Carbon Dioxide: Unable to obtain a valid result.

Creatinine: 1.3 mg/dl

David L Black Ph.D. 7/17/00

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

7/18/00 pm

0575

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ANALYTICAL LABORATORIES, INC
345 HILL AVENUE, NASHVILLE, TN 37210
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David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED :04/19/00 Page 1 of 1
DATE RECEIVED :04/19/00 11:53
DATE REPORTED :04/25/00 14:46

CLIENT # :00-0956
AEGIS # :278282
INSTITUTION :Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(40569) PROFILE - ME 9

****

Specimen was analyzed for the following drugs:

DRUG	DRUG
Acetaminophen	Opiates and Synthetic Narcotics
Amphetamines	Phencyclidine (PCP)
Barbiturates/Sedative Hypnotics	Phenothiazines
Benzodiazepines	Salicylate
Cannabinoids (Urine only)	Tricyclics
Cocaine	

Positive drug results are reported only after confirmation by Gas Chromatography/Mass Spectrometry (GC/MS) or a Forensically acceptable alternative method of analysis.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Urine

TEST RESULTS: NO DRUGS DETECTED

David L. Black Ph.D. 4/25/00
David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

4/19/00 PM

0576

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ANALYTICAL LABORATORIES, INC.
345 HILL AVENUE, NASHVILLE, TN 37210
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David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 1 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(00420) GC/MS BARBITURATES (ZT)

****

Specimen submitted for confirmation was analyzed for Amobarbital, Butalbital Butabarbital, Pentobarbital, Secobarbital, and Phenobarbital using Gas Chromatography/Mass Spectrometry with a reporting threshold of 100 ng/mL. A positive report is issued after comparison to known standard reference material and matching retention time and fragmentation data. Positive specimens will be retained frozen for 366 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: POSITIVE

Pentobarbital: 1090 ng/mL

David L. Black Ph.D.
David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

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David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 2 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(40250) ETHANOL/VOLATILES

****

Specimen was analyzed for Ethyl Alcohol, Methyl Alcohol, Isopropyl Alcohol, and Acetone using Gas Chromatography. A positive report is issued after comparison to know standard reference material and matching retention time data. Positive specimens will be retained frozen for 366 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: NO DRUGS DETECTED

David L. Black, Ph.D. 8/4/00

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

0578

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ANALYTICAL LABORATORIES, INC.
345 HILL AVENUE, NASHVILLE, TN 37210
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David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 4 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(42090) THIOPENTAL (PENTOTHAL)

****

Specimen was analyzed for thiopental (Pentothal) by Gas Chromatography/ Mass Spectrometry (GC/MS) techniques. A positive report is issued after comparison to known standard reference material and matching retention time and fragmentation data. Positive specimens will be retained frozen for 366 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: POSITIVE

Thiopental: 10200 ng/mL

David L Black Ph.D 8/4/00

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

13=13

0579

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ANALYTICAL LABORATORIES, INC
345 HILL AVENUE, NASHVILLE, TN 37210
Telephone: (615) 255-2400 ■ Facsimile: (615) 255-3030

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

DATE COLLECTED : 04/19/00 Page 3 of 4
DATE RECEIVED : 04/19/00 11:53
DATE REPORTED : 08/04/00 16:45

CLIENT # : 00-0956
AEGIS # : 278283
INSTITUTION : Dr. Bruce Levy
Forensic Medical
84 Hermitage AVe
Nashville, TN 37210

(41787) PANCURONIUM (PAVULON)

****

Specimen was analyzed for pancuronium (Pavulon) by Gas Chromatography/ Mass Spectrometry (GC/MS) techniques. A positive report is issued after comparison to known standard reference material and matching retention time and fragmentation data. Positive specimens will be retained frozen for 366 days following the date of this report.

****

PROFILE RESULTS

REASON FOR TEST: Post Mortem

SPECIMEN: Blood

TEST RESULTS: POSITIVE

Pancuronium: 4700 ng/mL

David L Black Ph.D 8/4/00 13-14

David L. Black, Ph.D., DABFT, DABCC
Director of Laboratories

0580

Exhibit 6 to Dr. Lubarsky's Affidavit

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE MEDICAL EXAMINER
850 R.S. Gass Blvd., Nashville TN 37216-2640
(615) 743-1800
REPORT OF INVESTIGATION BY COUNTY MEDICAL EXAMINER

MEC 07-1561

State Number: 07-19-1041

DECEDENT: Philip Workman
RACE: White **SEX:** Male **AGE:** 56 Years **MARITAL STATUS:**
HOME ADDRESS: 7475 Cockrill Bend Boulevard TDOC ; Nashville , TN

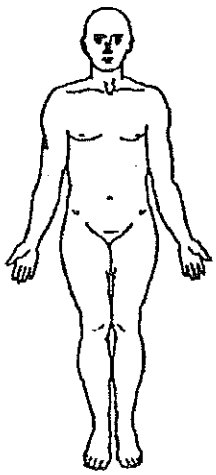
OCCUPATION: Inmate **DATE OF BIRTH:** [redacted]/53

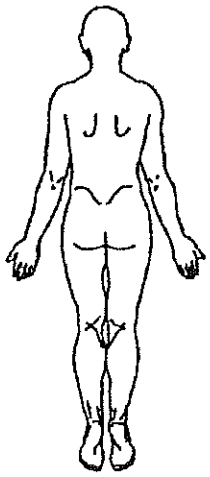
TYPE OF DEATH: ☐ Apparent Natural/Unattended ☐ Motor Vehicle Cremation: N
☐ Casualty ☐ Other
☐ Homicide/Suspected Homicide ☐ Suddenly when in apparent health
☒ In Prison ☐ Suicide

COMMENT: Lethal injection.
AGENCY INVESTIGATOR AND COMPLAINT #: TN Dept. of Corrections

DESCRIPTION OF BODY: ☐ Clothed ☐ Unclothed ☐ Partly Clothed Circumcised?
Eyes: Hair: Mustache: Beard:
Weight: (Lbs.) Length: (In.) Body Temp:
Rigor? Livor Color: Fixed?

Marks & Wounds





CERTIFIED COPY
I hereby certify that this is a true and correct copy of the medical examiner's report on file at the Office of the State Medical Examiner, Nashville TN.
By A. Standley Date 4/16/08

Probable Cause of Death	Manner of Death		Disposition Of Case
Acute intoxication by the combined effects of pentothal, pavulon and potassium	☐ Accident ☒ Homicide ☐ Suicide Cremation Approved: N	☐ Natural ☐ Could Not Be Determined ☐ Pending Investigation	Medical Examiner Jurisdiction: Accepte Autopsy Ordered: Autopsy Toxicology: Y Responsible for Death Certificate: ☒ Medical Examiner ☐ Other Physician Funeral Home: Eastland Funeral Home

I hereby declare that after receiving notice of death described herein, I took charge of the body and made inquiries regarding the cause of death in accordance with Section 38-7-101-117 Tennessee Code Annotated and that the information contained herein regarding such death is true and correct to the best of my knowledge and belief.

October 24, 2007
Date

Davidson
County of Appointment

Signature of County Medical Examiner

Exhibit 6 - Lubarsky Affidavit

	Last Seen Alive	Injury or Illness	Death	Discovery	Medical Examiner Notified	View of Body	Police Notified
Date	05/09/2007	05/09/2007	05/09/2007		05/09/2007		
Time	01:30 AM	01:21 AM	01:38 AM		01:40 AM		

	Location	City or County	Type of Premises (hospital, hotel, highway, etc.)
Injury or onset of illness	7475 Cockrill Bend Boulevard	Nashville, TN	Prison
Death	7475 Cockrill Bend Boulevard	Nashville	Prison
Viewing of body by Medical Examiner			

MEDICAL ATTENTION AND HOSPITAL, INSTITUTIONAL CARE OR HOME HEALTH CARE

Name of Physician or Institution	Address	Diagnoses	Dates

(35) CIRCUMSTANCES OF DEATH

	Name	Address
Found Dead By	Warden Ricky Bell	7475 Cockrill Bend Boulevard ; Nashville, TN 37209
Last Seen Alive By	Warden Ricky Bell	7475 Cockrill Bend Boulevard ; Nashville, TN 37209
Witness to Injury or Illness	Dr. Frank Thomas	
Witness to Death	Terry Workman	[redacted] 42211
Next of Kin		

(36) NARRATIVE SUMMARY OF CIRCUMSTANCES SURROUNDING DEATH
Reportedly this 53 y.o. W/M was an inmate with the Tennessee Department of Corrections who had his death sentence carried out on this date and death was pronounced at the site at 01:38. The body was photographed on the execution table in the execution chamber prior to removal of the body by Correctional Officer's and Middle Tennessee Removal Service personnel Chris Moss. The body was next placed in the transport van and escorted by Tennessee Highway Patrol Officer's to the Center for Forensic Medicine for an examination by the medical examiner. Lance V. Long 05/09/2007

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE STATE MEDICAL EXAMINER
Center for Forensic Medicine
850 R.S. Gass Blvd.
Nashville, Tennessee 37216-2640

CASE: MEC07-1561
County: DAVIDSON

AUTOPSY REPORT

NAME OF DECEDENT: WORKMAN, PHILLIP **RACE:** W **SEX:** M **AGE:** 56

HOME ADDRESS: TDOC, Nashville TN

DATE AND TIME OF DEATH: May 9, 2007 at 1:38 a.m.

DATE AND TIME OF AUTOPSY: May 19, 2007 at 8:00 a.m.

COUNTY MEDICAL EXAMINER: Bruce P. Levy, M.D.

ADDRESS: 850 R.S. Gass Blvd., Nashville, TN 37216-2640

DISTRICT ATTORNEY GENERAL: Honorable Victor S. Johnson

ADDRESS: Washington Square, Suite 500, 222 2nd Avenue North, Nashville, TN 37201

PATHOLOGIC DIAGNOSES

1. Lethal injection:

   a. Intravenous catheters placed in each antecubital fossa.
   b. Dermal punctures of both upper extremities.
   c. Toxicology positive for:

      1) Thiopental (18,900 ng/ml heart blood).
      2) Pentobarbital (615 ng/ml heart blood).
      3) Pancuronium (630 ng/ml heart blood).
      4) Potassium (>9 mmol/L vitreous).

CAUSE OF DEATH: Acute intoxication by the combined effects of pentothal, pavulon and potassium

MANNER OF DEATH: Homicide

CIRCUMSTANCES OF DEATH: Judicial execution by lethal injection

---

I hereby certify that I, Bruce P. Levy, M.D. have performed an autopsy on the body of Philip Workman on the 19th day of May 2007 at 8:00 a.m. in the State of Tennessee Center for Forensic Medicine. The purpose of this report is to provide a certified opinion to the County Medical Examiner and District Attorney General. The facts and findings to support these conclusions are filed with the Tennessee Department of Health.

EXTERNAL EXAMINATION

The body is that of a well-developed, well-nourished white male, measuring 67 inches and weighing 207-1/2 pounds, whose appearance is consistent with the reported age of 53 years. The head hair is brown and gray in color with male pattern baldness, measuring a maximum of approximately 6 inches in length. There is a mustache and goatee on the clean-shaven face. The irides are dark with cloudy corneas. The conjunctivae are congested, left greater than right, without petechiae. The ears are unremarkable. The nasal septum is deviated towards the right. The mouth is unremarkable and does not contain any significant quantity of foreign material. Upper and lower denture plates are in place.

The anterior torso is symmetric with a very slightly protuberant soft abdomen. The posterior torso is unremarkable. There is a 1-3/4 x 1 inch patch of slightly pigmented skin on the left middle portion of the back. The upper extremities are symmetric and unremarkable. The lower extremities are symmetric with very slight superficial varicosities. There is marked peripheral cyanosis. External genitalia are those of a circumcised male with descended testes. There are scattered pigmented moles on the body.

Rigor mortis is full and symmetric. Livor mortis is red purple in color, posterior in distribution, and fixed. The body is cold to touch. There is slight drying artifact of scrotum and focal areas of superficial skin slipping.

THERAPEUTIC PROCEDURES: None.

SCARS: There is a 1/2 inch area of scarring to the right of the umbilicus. There is a 2-1/2 inch linear scar on the left lower portion of the back.

There are two 1/4 inch scars on the anterior aspect of the right upper arm near the right antecubital fossa. There are multiple areas of scarring within the right antecubital fossa that measure between 1/4 inch and 1/2 inch in dimension each. There are scattered small linear scars in the right radial area that measure between 1/4 inch and 1/2 inch in length each. There are scattered small scars on the dorsum of the right hand and posterior forearm.

There is a 3/8 inch linear scar in the left antecubital fossa. There is a 3/8 inch linear scar on the anterior aspect of the left forearm. There is a 1/4 inch linear scar on the thenar eminence of the left hand. There are scattered small scars on the dorsum of the left hand and posterior forearm.

There is a 3/4 x 1/2 inch scar on the anterior aspect of the right knee.

There is a 3/16 inch circular pigmented scar with hyperpigmented rims and a hypopigmented center on the anterior aspect of the left calf.

TATTOOS: None.

INJURIES:

LETHAL INJECTION: Intravenous catheters are inserted into superficial veins through dermal punctures of both antecubital fossae. Two additional dermal punctures are noted within the right antecubital fossa. A single dermal puncture is noted on the anterior aspect of the left forearm near the left antecubital fossa.

OTHER SUPERFICIAL INJURIES: There is a 1/8 inch abrasion on the posterior aspect of the proximal phalanx of the thumb of the right hand. There is a 1/8 x 1/16 inch abrasion of the cuticle of the second finger of the left hand.

The above injuries, having been described, will not be repeated.

INTERNAL EXAMINATION

HEAD: The scalp is unremarkable without abrasions, contusions or lacerations. The skull is intact without fracture. The meningeal coverings of the brain are intact without epidural, subdural or subarachnoid hemorrhages.

The brain is symmetric with an unremarkable gyral pattern over the cerebral hemispheres. There are no visible injuries on the surface of the brain.

NECK: There are no hemorrhages into the musculature or soft tissues of the neck. The hyoid, larynx, and trachea are palpably intact. The cervical vertebrae are palpably intact.

BODY CAVITIES: All organs are in their normal anatomic locations. The pleural, pericardial, and peritoneal cavities have smooth and glistening surfaces. Typical quantities of translucent fluid are present within the body cavities.

CARDIOVASCULAR SYSTEM: The great vessels are normally distributed. There are no palpable clots in the pulmonary arteries. The aorta has no palpable calcifications or abnormal dilations.

The heart has a smooth, glistening, intact epicardial surface. It is not apparently enlarged or dilated. The coronary arteries do not have palpable calcifications.

RESPIRATORY SYSTEM: The right and left lungs are normally lobated. The pleural surfaces are glistening and intact with slight to moderate black anthracotic pigment deposits. The lung parenchyma is well aerated without palpable masses or consolidations. There is vascular congestion in dependent segments.

DIGESTIVE SYSTEM AND LIVER: The esophagus, stomach, duodenum, small intestines, appendix, and large intestines are unremarkable on serosal surfaces without palpable abnormalities.

The liver is normal in size with a slightly firm and irregular capsule. The parenchyma is red-brown in color. The unremarkable gallbladder contains approximately 8 ml. of bile. The extrahepatic bile ducts are unremarkable. The pancreas is unremarkable except for autolysis.

RETICULOENDOTHELIAL SYSTEM: The spleen is normal in size and unremarkable. There

is a normal distribution of unremarkable lymph nodes. The thymus gland is involuted.

GENITOURINARY SYSTEM: The kidneys are normal in size. The subcapsular surfaces are smooth. The unremarkable urinary bladder contains approximately 20 ml. of urine.

ENDOCRINE SYSTEM: The thyroid and adrenal glands are normal in size without palpable masses or nodularity.

MUSCULOSKELETAL SYSTEM: The musculoskeletal system is intact and unremarkable. There are moderately increased quantities of subcutaneous and intra-cavity adipose tissue.

TOXICOLOGY: The following specimens are submitted for possible toxicologic analysis: Blood, bile, urine and vitreous humor. A separate report will be issued.

SUMMARY OF CASE

This 53 year old male was executed by lethal injection on May 9, 2007 at 1:21 a.m. and was pronounced deceased at 1:38 a.m. His body was recovered from the execution chamber and an autopsy was ordered.

The body was held in a sealed body bag until an autopsy was performed on May 19, 1007 at 8:00 a.m. By agreement with the next-of-kin autopsy was limited to viewing and palpating the internal organs in-situ. Removal and dissection were only to be performed if abnormal observations required additional inquiry. None were necessary in this case.

There were no significant unusual findings at autopsy. Toxicology specimens were obtained and tested. Results are attached.

In my opinion, this person died as a result of an acute combined intoxication. The manner of death is homicide.

Signature _____ Date 6/29/07

Bruce P. Levy, M.D.
Chief Medical Examiner

BPL/lmr
T: 06/29/2007

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343844
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 08:42
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Heart Blood		

Workman, Phillip

Test(s) Ordered:
40599 - Profile-ME Comprehensive
41787 - Pancuronium (Pavulon)
42090 - Thiopental (Pentothal)
70521 - Confirmation Barbiturates

Drug Class	Result	Quantitation	Reporting Threshold
Pancuronium (Pavulon)	POSITIVE		
Pancuronium	**POSITIVE**	630 ng/mL	1 ng/mL
Thiopental (Pentothal)	POSITIVE		
Thiopental	**POSITIVE**	18900 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		50 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Barbiturates	**POSITIVE**		
Amobarbital	NONE DETECTED		50 ng/mL
Butabarbital	NONE DETECTED		50 ng/mL
Butalbital	NONE DETECTED		50 ng/mL
Pentobarbital	**POSITIVE**	615 ng/mL	50 ng/mL
Secobarbital	NONE DETECTED		50 ng/mL
Talbutal	NONE DETECTED		50 ng/mL
Sedatives/Hypnotics	NONE DETECTED		50 ng/mL
Methadone	NONE DETECTED		50 ng/mL
Benzodiazepines	NONE DETECTED		25 ng/mL
Cannabinoids (Marijuana)	NONE DETECTED		1 ng/mL
Cocaine Metabolite	NONE DETECTED		10 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

Exhibit 6 - Lubarsky Affidavit

07

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343844
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 08:42
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Heart Blood		

Test(s) Ordered:
40599 - Profile-ME Comprehensive
41787 - Pancuronium (Pavulon)
42090 - Thiopental (Pentothal)
70521 - Confirmation Barbiturates

Drug Class	Result	Quantitation	Reporting Threshold
Opiates	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		50 ng/mL
Phenothiazines	NONE DETECTED		1 ng/mL
Salicylate	NONE DETECTED		
Salicylate	NONE DETECTED		5 mg/L
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

----- END OF REPORT -----

Exhibit 6 - Lubarsky Affidavit

08

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343845
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 14:53
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
42090 - Thiopental (Pentothal)
41787 - Pancuronium (Pavulon)
70520 - Confirmation Barbiturates
71850 - Confirmation Phenobarbital

Drug Class	Result	Quantitation	Reporting Threshold
Pancuronium (Pavulon)	POSITIVE		
Pancuronium	**POSITIVE**	300 ng/mL	1 ng/mL
Thiopental (Pentothal)	CANCELED		
Thiopental	CANCELED		1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		100 ng/mL
Barbiturates	**POSITIVE**		
Butabarbital	NONE DETECTED		100 ng/mL
Butalbital	NONE DETECTED		100 ng/mL
Pentobarbital	**POSITIVE**	245 ng/mL	100 ng/mL
Secobarbital	NONE DETECTED		100 ng/mL
Talbutal	NONE DETECTED		100 ng/mL
Amobarbital	NONE DETECTED		100 ng/mL
Benzodiazepines	NONE DETECTED		100 ng/mL
Cannabinoids (Marijuana)	NONE DETECTED		5 ng/mL
Cocaine Metabolite	NONE DETECTED		50 ng/mL
Opiates	NONE DETECTED		50 ng/mL
Phencyclidine (PCP)	NONE DETECTED		10 ng/mL
Phenothiazines	NONE DETECTED		5 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date:

OCT 02 2007

Exhibit 6 - Lubarsky Affidavit

09

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343845
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 14:53
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
42090 - Thiopental (Pentothal)
41787 - Pancuronium (Pavulon)
70520 - Confirmation Barbiturates
71850 - Confirmation Phenobarbital

Drug Class	Result	Quantitation	Reporting Threshold
Stimulants	NONE DETECTED		50 ng/mL
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		100 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL
Salicylate	NONE DETECTED		1 mg/L
Sedatives/Hypnotics	NONE DETECTED		200 ng/mL

The sample quantity submitted is not sufficient to complete required testing.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E CURTIS MS
Date: OCT 02 2007

----- END OF REPORT -----

Exhibit 6 - Lubarsky Affidavit

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343846
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 10:00
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Bile		

Test(s) Ordered: 42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Thiopental	POSITIVE	4470 ng/mL	1 ng/mL

The sample quantity submitted is not sufficient to complete required testing.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

----- END OF REPORT -----

Exhibit 6 - Lubarsky Affidavit

AEGIS
SCIENCES CORPORATION
345 Hill Avenue Nashville, TN 37210
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	07-1561
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4343847
	Forensic Medical	**Collected:**	05/19/07 00:00
	850 RS Gass Blvd	**Received:**	05/22/07 13:04
	Nashville, TN 37216	**Completed:**	10/02/07 11:38
		Reported:	10/02/07 15:00
Reason:	Post-mortem		
Specimen Type:	Vitreous		

Test(s) Ordered: 42197 - Vitreous Electrolyte Profile

Drug Class	Result	Quantitation	Reporting Threshold
Vitreous Electrolyte Profile	POSITIVE		
Glucose	NONE DETECTED		20 mg/dL
Blood Urea Nitrogen(BUN)	**POSITIVE**	26 mg/dL	1 mg/dL
Sodium(Na)	**POSITIVE**	116 mmol/L	1 mmol/L
Potassium(K)	**POSITIVE**	> 9 mmol/L	1 mmol/L
Chloride(Cl)	**POSITIVE**	115 mmol/L	1 mmol/L
Carbon Dioxide(CO2)	NONE DETECTED		1 mmol/L
Creatinine	**POSITIVE**	0.8 mg/dL	0.1 mg/dL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, MS
Date: OCT 02 2007

----- END OF REPORT -----

Exhibit 6 - Lubarsky Affidavit

Exhibit 7 to Dr. Lubarsky's Affidavit

TENNESSEE DEPARTMENT OF HEALTH
OFFICE OF THE CHIEF MEDICAL EXAMINER

REPORT OF INVESTIGATION BY COUNTY MEDICAL EXAMINER

Davidson County Medical Examiner: Bruce Levy M.D.

State Medical Examiner: Bruce Levy M.D.

Judicial District Number: 20

District Attorney: Honorable Victor S. Johnson III

State Number: 09-19-0295

Case Number: MEC09-0201

1. Name of Decedent	2. Age	3. Race	4. Sex
Steve Morris Henley	55 Years	White	Male

5. Address

Riverbend Maxium Security Institution, 7475 Cockrill Bend Boulevard, Nashville, TN 37243

6. Date of Death	7. Type of Death	8. Investigating Agency/Complaint #:
02/04/2009 1:33 AM	In Jail/Prison/In Police Custody	

9. Place of Death

7475 Cockrill Bend Boulevard, Nashville, TN

10. Narrative Summary

The decedent is a 55 yr. old w/m that was reportedly a prisoner at the Riverbend Maximum Security Institution. The decedent was given a lethal injection according to the sentencing ordered by the State of Tennessee. Death was pronounced at 01:33 hrs. on 02/04/2009 by Dr. Thomas. Photographs were taken of the decedent inside the execution chamber for documentation purposes. The decedent was transported to the Center for Forensic Medicine for examination by the Medical Examiner. Sherrie L. Saint, Investigator

11. Jurisdiction Accepted	12. Autopsy Ordered	13. Toxicology Ordered
Yes	Yes	Yes

14. Physician Responsible for Death Certificate

Bruce P Levy, M.D.

15. Cremation Approved	16. Funeral Home
Yes	Upper Cumberland Funeral Home

17. Cause of Death

Acute thiopental, pancuronium and potassium toxicity

18. Contributory Cause of Death

19. Manner of Death

Homicide

CERTIFIED COPY

I hereby certify that this is a true and correct copy of the medical examiner's report on file at the Office of the State Medical Examiner, Nashville TN.

By VanBuren Date 3/10/10

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT
OFFICE OF THE STATE MEDICAL EXAMINER
Center for Forensic Medicine
850 R.S. Gass Blvd.
Nashville, Tennessee 37216-2640

CASE: MEC09-0201
County: DAVIDSON

AUTOPSY REPORT

NAME OF DECEDENT: HENLEY, STEVE MORRIS **RACE:** W **SEX:** M **AGE:** 55

HOME ADDRESS: 7475 Cockrill Bend Blvd., Nashville TN

DATE AND TIME OF DEATH: February 4, 2009 at 1:33 a.m.

DATE AND TIME OF AUTOPSY: February 4, 2009 at 9:10 a.m.

FORENSIC PATHOLOGIST: Bruce P. Levy, M.D.

COUNTY MEDICAL EXAMINER: Bruce P. Levy, M.D.

DISTRICT ATTORNEY GENERAL: Honorable Victor S. Johnson, III

PATHOLOGIC DIAGNOSES

1. Lethal injection, clinical history:

   a. Toxicology positive for thiopental and pancuronium.

      1) Blood thiopental level toxic (8310 ng/mL).
      2) Blood pancuronium level lethal (1600 ng/mL).
      3) Thiopental (1810 ng/mL) and pancuronium (22 ng/mL).
      4) Vitreous potassium not elevated (6 mmol/L).

   b. Pulmonary vascular congestion and edema (1270 grams combined lung weight).

2. Hypertensive cardiovascular disease:

   a. Cardiac hypertrophy (570 grams).
   b. Arteriolar nephrosclerosis.
   c. Aortic atherosclerosis, slight.
   d. Blood verapamil level therapeutic (70 ng/mL).

3. Urine toxicology positive for carboxy-THC (39 ng/mL):

   a. Blood toxicology negative for cannabinoids.

(Continued)

4. Cholelithiasis.

5. Benign prostatic hypertrophy.

CAUSE OF DEATH:	Acute thiopental, pancuronium and potassium toxicity
MANNER OF DEATH:	Homicide
CIRCUMSTANCES OF DEATH:	Judicial execution – Lethal injection

---

I hereby certify that I, Bruce P. Levy, M.D. have performed an autopsy on the body of Steve Morris Henley on the fourth day of February 2009 at 9:10 am in the State of Tennessee Center for Forensic Medicine. The purpose of this report is to provide a certified opinion to the County Medical Examiner and District Attorney General. The facts and findings to support these conclusions are filed with the Tennessee Department of Health. The autopsy was performed in the presence of Dr. McMaster.

EXTERNAL EXAMINATION

The body is that of a well-developed, slightly obese white male, measuring 71 inches and weighing 239-1/2 pounds, whose appearance is consistent with the reported age of 55 years. The head hair is light brown in color, measuring approximately 5 inches long. There is a mustache on the clean-shaven face. The irides are hazel/green in color and the pupils are round. The sclerae are anicteric and the conjunctivae are slightly injected without petechiae. The ears, nose and mouth are unremarkable. A slight quantity of translucent liquid is present in the mouth. Natural teeth are in fair repair with some missing teeth with healed gums.

The anterior torso is symmetric with a protuberant soft abdomen. The posterior torso is unremarkable. The upper and lower extremities are symmetric and unremarkable. External genitalia are those of a circumcised male with descended testes.

Rigor mortis is absent. Livor mortis is purple in color, posterior in distribution, and blanching. The body is warm to touch. There is drying artifact of the scrotum.

THERAPEUTIC PROCEDURES: None.

SCARS: There is a minimum of three linear scars on the dorsum of the left hand that measure between 1/4 inch and 3/4 inch long each. There is a 1/2 x 1/4 inch scar on the anterior aspect of the right forearm.

TATTOOS: None.

INJURIES:

LETHAL INJECTION: Intravenous catheters are inserted into superficial blood vessels of both antecubital fossae. They are attached with intravenous tubing to normal saline intravenous bags. There is an additional dermal puncture of the left antecubital fossa with a surrounding 1/8-inch area of subcutaneous hemorrhage.

The following items are received with the body:

There are a total of 22 syringes. There are four syringes with red colored labels stating, "sodium thiopental," that are all empty. There are two syringes with red colored labels stating, "pancuronium bromide," that are all empty. There are two syringes with red colored labels stating, "potassium chloride," that are all empty. There are three syringes with red colored labels stating, "saline," that are all empty. There are an identical set of 11 syringes with blue colored labels that contain the same indicated items, except each syringe contains 50 mL of a translucent fluid.

There are a total of 67 glass medication bottles. There are 19 bottles labeled "pentothal 500 mg,"

of which 18 are empty and 1 still contains a translucent liquid. There are 10 empty bottles labeled "potassium chloride 40 mEq." There are 20 empty bottles labeled "pancuronium bromide 10 mL." There are 18 empty bottles labeled "sterile water 20 mL."

An additional normal saline intravenous bag is received with the body.

The above injuries, having been described, will not be repeated.

INTERNAL EXAMINATION

HEAD: The scalp is unremarkable without abrasions, contusions or lacerations. The skull is intact without fracture. The meningeal coverings of the brain are intact without epidural, subdural or subarachnoid hemorrhages.

The 1530-gram brain is symmetric with an unremarkable gyral pattern. There are no visible injuries on the surface or cut section of the brain. The distribution of cranial nerves at the base of the brain is normal. The cerebral vessels are unremarkable and normally distributed. Coronal sections through the cerebral hemispheres reveal a normal distribution of gray and white matter without focal lesions. The ventricles are of normal configuration and size. Horizontal sections through the cerebellum and brain stem reveal a normal distribution of gray and white matter without focal lesions.

NECK: There are no hemorrhages into the musculature or soft tissues of the neck. The hyoid, larynx, and trachea are intact without obstructions. The tongue is unremarkable without injury. The cervical vertebrae are palpably intact.

BODY CAVITIES: All organs are in their normal anatomic locations. The pleural, pericardial, and peritoneal cavities have smooth and glistening surfaces. Typical quantities of translucent fluid are present within the body cavities.

CARDIOVASCULAR SYSTEM: The great vessels are normally distributed without thromboemboli. There are slight atherosclerotic deposits of the aorta. The coronary artery ostia are normally placed and free of significant atherosclerotic obstruction.

The 570-gram heart has a smooth, glistening, intact epicardial surface. The right dominant coronary arteries are normally distributed and free of significant atherosclerosis. The myocardium is homogeneous red-brown in color without focal lesions. The left and right ventricles are 1.5 and 0.3 cm. in thickness at the lateral walls, respectively, and symmetric. The endocardial surfaces and four cardiac valves are unremarkable. The papillary muscles and chordae tendineae are normal. The mitral and tricuspid valves measure 11.4 and 12.2 cm. in circumference, respectively.

RESPIRATORY SYSTEM: The right and left lungs weigh 730 and 540 grams, respectively. The lungs are normally lobated. The pleural surfaces are glistening and intact. The pulmonary arteries are free of thromboemboli. The bronchi are unremarkable. The parenchyma is pink/tan in color and well aerated with slight quantities of expressed frothy fluid from both lungs. There are no focal lesions or consolidations. There is vascular congestion in dependent segments.

DIGESTIVE SYSTEM AND LIVER: The esophagus is unremarkable with a sharp gastroesophageal junction. The unremarkable stomach contains approximately 250 mL of well-

chewed and partially digested food. The duodenum, small intestines, appendix, and large intestines are unremarkable.

The 2410-gram liver has a smooth, intact capsule. The parenchyma is slightly pale brown/tan in color and soft without focal lesions. The unremarkable gallbladder contains approximately 2 ml. of bile and three yellow colored multifaceted gallstones that measure a maximum of 1.0 cm in diameter. The extrahepatic bile ducts are patent and unremarkable. The pancreas is unremarkable.

RETICULOENDOTHELIAL SYSTEM: The 360 gram spleen is congested without focal lesions. There is a normal distribution of unremarkable lymph nodes. The thymus gland is involuted.

GENITOURINARY SYSTEM: The right and left kidneys weigh 220 and 230 grams, respectively. The subcapsular surfaces are smooth. The cortices are of normal thickness with sharp corticomedullary junctions. The calices, pelves, and ureters are patent and unremarkable. The unremarkable urinary bladder contains approximately 50 ml. of urine.

The testes and seminal vesicles are unremarkable. The prostate gland is slightly enlarged with faint diffuse nodularity.

ENDOCRINE SYSTEM: The pituitary, thyroid, parathyroid and adrenal glands are unremarkable.

MUSCULOSKELETAL SYSTEM: The musculoskeletal system is intact and unremarkable. There are slightly increased quantities of subcutaneous and intra-cavity adipose tissue.

TOXICOLOGY: The following specimens are submitted for possible toxicologic analysis: Blood, bile, urine and vitreous humor. A separate report will be issued.

HISTOLOGY: The following specimens are submitted for histologic examination: Hard, bronchus, lungs, liver, kidney and brain. A separate report will be issued.

SUMMARY OF CASE

This 55-year-old male was executed by lethal injection on February 4, 2009. He was pronounced deceased at 0133 hours. An autopsy was ordered.

Autopsy revealed a slightly obese male with an enlarged heart, pulmonary edema and generalized vascular congestion. There is a history of hypertension and he is reportedly prescribed verapamil. Specimens were obtained for toxicology and histology studies.

Histologic examination of the organs confirmed left ventricular hypertrophy (an enlarged heart). There were no other significant pathologic findings.

Toxicology was positive for multiple substances. Testing of femoral blood was positive for toxic levels of both thiopental (8310 ng/mL) and pancuronium (1600 ng/mL). Both of these substances were also detected in urine (thiopental 1810 ng/mL and pancuronium 22 ng/mL). The vitreous potassium level (6 mmol/L) was not elevated, indicating that injected potassium had not diffused into the orbits. Verapamil was detected in the blood at therapeutic levels (70 ng/mL) and urine (250

ng/mL). A metabolite of marijuana (carboxy-THC 39 ng/mL) was unexpectedly detected in the urine. Repeat testing confirmed the presence of the substance in the urine, which also contained the same substances that were known to be in his body at the time of death. Testing of the blood was negative for any cannabinoids. Testing of the bile was attempted, but no results could be obtained due to sample matrix problems.

In my opinion, this person died as a result of a combined toxicity from the three agents used in the lethal injection procedure (thiopental, pancuronium and potassium). The manner of death is homicide.

Electronically signed by Bruce P. Levy, M.D. on Wednesday, February 17, 2010

Bruce P. Levy, M.D.
Chief Medical Examiner

OFFICE OF THE MEDICAL EXAMINER
FORENSIC MEDICAL

REPORT OF MICROSCOPIC EXAMINATION

Name of Deceased: HENLEY, STEVE MORRIS **MEC09-0201**

Date of Report: March 11, 2009

HEART: Sections of both ventricles are examined. There are increased quantities of epicardial fat. The myocardium of the left ventricle is hypertrophied with abundant eosinophilic cytoplasm and enlarged nuclei. There is an increase in interstitial fibrosis, primarily surrounding penetrating arterials. There are no significant ischemic or inflammatory changes. The myocardium of the right ventricle is unremarkable. The endocardial surfaces are unremarkable.

LEFT MAIN BRONCHUS: The mucosal surface consists of respiratory epithelium with focal autolysis. The submucosa and submucosal glands are unremarkable without significant inflammation. The muscle and cartilage are unremarkable.

LUNGS: Sections of both lungs are examined. The overall architecture of the lungs is unremarkable. There is slight to moderate hyperexpansion of distal pulmonary segments. The pleural surfaces are unremarkable. There is vascular congestion of the otherwise unremarkable pulmonary vessels. Bronchi are unremarkable. Alveolar walls are thin, and alveoli are free of significant inflammation. Alveoli contain variable quantities of an amorphous faintly eosinophilic material.

LIVER: The liver capsule is unremarkable. Hepatocytes contain a foamy cytoplasm with rare (less than 1%) clear cytoplasmic vacuoles. There are no significant cellular inclusions or cellular necrosis. Portal areas contain slightly increased numbers of mononuclear inflammatory cells, but are not enlarged and do not have increased fibrosis. There is vascular congestion of the otherwise unremarkable hepatic sinusoids.

KIDNEY: The overall architecture of the kidney is unremarkable. There are rare sclerotic glomeruli. Remaining glomeruli appear unremarkable without significant increased cellularity. Tubules are unremarkable. There is vascular congestion.

BRAIN: Sections of the cerebral cortex, hippocampus, cerebellum and brainstem are examined. The arachnoid membranes are unremarkable without significant hemorrhage or inflammation. There is normal layering of the cerebral cortex without ischemic, inflammatory or neoplastic changes. The overall architecture of the hippocampus is unremarkable, and there is no significant ischemic change. The overall architecture of the cerebellum is unremarkable. Purkinje and granular cell layers are present without significant ischemic change. A section through the midbrain reveals a normal distribution of white matter tracks and deep nuclei without significant ischemic, inflammatory or neoplastic changes. The substantial nigra is appropriately pigmented. The ventricular system is lined by simple epithelium and appears unremarkable.

Electronically signed by Bruce P. Levy, M.D. on Wednesday, February 17, 2010

AEGIS
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515 Great Circle Road Nashville, TN 37228
Ph: (615) 255-2400 Fax: (615)255-3030 Web: www.aegislabs.com

Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391261
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:46
	Nashville, TN 37216	**Completed:**	03/14/09 09:12
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Femoral Blood		

Henley, Steve

Test(s) Ordered:

40599 - Profile-ME Comprehensive
70524 - Confirmation Barbiturates
70531 - Confirmation Benzodiazepines
71071 - Confirm Blood Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Thiopental	POSITIVE	8310 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		10 mcg/mL
Amphetamines	NONE DETECTED		50 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Verapamil	POSITIVE		
Verapamil	POSITIVE	70 ng/mL	50 ng/mL
Barbiturates	NONE DETECTED		200 ng/mL
Meprobamate	NONE DETECTED		1250 ng/mL
Methadone	NONE DETECTED		
Benzodiazepines	NONE DETECTED		25 ng/mL
Cannabinoids (Marijuana)	NONE DETECTED		1 ng/mL
Cocaine Metabolite	NONE DETECTED		10 ng/mL
Opiates	NONE DETECTED		
Meperidine	NONE DETECTED		100 ng/mL
Fentanyl Analogues	NONE DETECTED		
Propoxyphene	NONE DETECTED		100 ng/mL
Fentanyl Group	NONE DETECTED		

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391261
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:46
	Nashville, TN 37216	**Completed:**	02/08/10 09:09
		Reported:	02/08/10 09:32
Reason:	Post-mortem		
Specimen Type:	Femoral Blood		

Test(s) Ordered:

40599 - Profile-ME Comprehensive
70524 - Confirmation Barbiturates
70531 - Confirmation Benzodiazepines
71071 - Confirm Blood Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Fentanyl Group	NONE DETECTED		1 ng/mL
Pentazocine	NONE DETECTED		100 ng/mL
Phenothiazines	NONE DETECTED		1 ng/mL
Salicylate	NONE DETECTED		50 mg/L
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

Pancuronium: Analysis by LC/TOFMS - POSITIVE - 1600 ng/mL
Amended Report

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by:
Date:

PAIGE LONG

FEB 10 2010

----- END OF REPORT -----

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391261
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:46
	Nashville, TN 37216	**Completed:**	03/14/09 09:12
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Femoral Blood		

Test(s) Ordered:

40599 - Profile-ME Comprehensive
70524 - Confirmation Barbiturates
70531 - Confirmation Benzodiazepines
71071 - Confirm Blood Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Pentazocine	NONE DETECTED		100 ng/mL
Phenothiazines	NONE DETECTED		1 ng/mL
Salicylate	NONE DETECTED		50 mg/L
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391262
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	02/05/09 13:48
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Heart Blood		

Test(s) Ordered: 49999 - Sample Received

Drug Class	Result	Quantitation	Reporting Threshold

Testing not requested or indicated.

Testing not requested or indicated.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date:

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MAR 14 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391263
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	03/14/09 09:05
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:
40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Thiopental	POSITIVE	1810 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		100 ng/mL
Barbiturates	NONE DETECTED		200 ng/mL
Verapamil	POSITIVE		
Verapamil	POSITIVE	250 ng/mL	50 ng/mL
Benzodiazepines	NONE DETECTED		100 ng/mL
Cannabinoids (Marijuana)	POSITIVE		
Carboxy-THC	POSITIVE	39 ng/mL	5 ng/mL
Cocaine Metabolite	NONE DETECTED		50 ng/mL
Opiates	NONE DETECTED		
Phencyclidine (PCP)	NONE DETECTED		10 ng/mL
Phenothiazines	NONE DETECTED		5 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		100 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL
Miscellaneous	NONE DETECTED		0.25 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391263
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	08/12/09 13:33
		Reported:	08/13/09 13:00
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Salicylate	NONE DETECTED		1 mg/L
Sedatives/Hypnotics	NONE DETECTED		1250 ng/mL
Methadone	NONE DETECTED		

Carboxy-THC results verified by repeat analysis.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date:

----- END OF REPORT -----

AUG 2 0 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy Forensic Medical 850 RS Gass Blvd Nashville, TN 37216	**Laboratory ID:**	4391263
		Collected:	02/04/09 00:00
		Received:	02/05/09 13:48
		Completed:	12/15/09 10:56
		Reported:	12/15/09 11:03
Reason:	Post-mortem		
Specimen Type:	Urine		

Henley, Steve

Test(s) Ordered:
40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Thiopental (Pentothal)	POSITIVE		
Pentobarbital	NONE DETECTED		100 ng/mL
Thiopental	**POSITIVE**	1810 ng/mL	1 ng/mL
Alcohol - Volatiles	NEGATIVE		10 mg/dL
Acetaminophen	NONE DETECTED		1 mcg/mL
Amphetamines	NONE DETECTED		100 ng/mL
Barbiturates	NONE DETECTED		200 ng/mL
Verapamil	POSITIVE		
Verapamil	**POSITIVE**	250 ng/mL	50 ng/mL
Benzodiazepines	NONE DETECTED		100 ng/mL
Cannabinoids (Marijuana)	**POSITIVE**		
Carboxy-THC	**POSITIVE**	39 ng/mL	5 ng/mL
Cocaine Metabolite	NONE DETECTED		50 ng/mL
Opiates	NONE DETECTED		50 ng/mL
Phencyclidine (PCP)	NONE DETECTED		10 ng/mL
Phenothiazines	NONE DETECTED		5 ng/mL
Stimulants	NONE DETECTED		50 ng/mL
Tricyclic Antidepressants	NONE DETECTED		50 ng/mL
Synthetic Narcotics	NONE DETECTED		100 ng/mL
Atypical Antidepressants	NONE DETECTED		10 ng/mL
Antipsychotics	NONE DETECTED		2 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date: DEC 16 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391263
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	12/15/09 10:56
		Reported:	12/15/09 11:03
Reason:	Post-mortem		
Specimen Type:	Urine		

Test(s) Ordered:

40569 - Profile-ME Comprehensive Urine
70540 - Confirmation Cannabinoids
02195 - Verapamil
42090 - Thiopental (Pentothal)

Drug Class	Result	Quantitation	Reporting Threshold
Miscellaneous	NONE DETECTED		0.25 ng/mL
Salicylate	NONE DETECTED		1 mg/L
Sedatives/Hypnotics	NONE DETECTED		1250 ng/mL
Methadone	NONE DETECTED		50 ng/mL

Carboxy-THC results verified by repeat analysis.
Amended Report
Pancuronium: Analysis by LC/TOF - POSITIVE - 22 ng/mL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date: DEC 16 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391264
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	12/15/09 10:59
		Reported:	12/15/09 11:03
Reason:	Post-mortem		
Specimen Type:	Bile		

Test(s) Ordered: 41071 - Blood Cannabinoids

Drug Class	Result	Quantitation	Reporting Threshold
Cannabinoids (Marijuana)	CANCELED		
Carboxy-THC	CANCELED		5 ng/mL
THC	CANCELED		1 ng/mL

Unable to obtain acceptable results for THC confirmation due to sample matrix problems.

Amended Report

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: PAIGE LONG
Date: DEC 16 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391264
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	02/05/09 13:49
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Bile		

Test(s) Ordered: 49999 - Sample Received

Drug Class	Result	Quantitation	Reporting Threshold

Testing not requested or indicated.

Testing not requested or indicated.

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date:

----- END OF REPORT -----

MAR 14 2009

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Client:	225 - Forensic Medical	**Case ID:**	09-0201
Report To:	Dr. Bruce Levy	**Laboratory ID:**	4391265
	Forensic Medical	**Collected:**	02/04/09 00:00
	850 RS Gass Blvd	**Received:**	02/05/09 13:48
	Nashville, TN 37216	**Completed:**	02/13/09 14:22
		Reported:	03/14/09 09:36
Reason:	Post-mortem		
Specimen Type:	Vitreous		

Test(s) Ordered: 42197 - Vitreous Electrolyte Profile

Drug Class	Result	Quantitation	Reporting Threshold
Vitreous Electrolyte Profile	POSITIVE		
Glucose	POSITIVE	23 mg/dL	20 mg/dL
Blood Urea Nitrogen(BUN)	POSITIVE	7 mg/dL	1 mg/dL
Sodium(Na)	POSITIVE	146 mmol/L	1 mmol/L
Potassium(K)	POSITIVE	6 mmol/L	1 mmol/L
Chloride(Cl)	POSITIVE	120 mmol/L	1 mmol/L
Carbon Dioxide(CO2)	POSITIVE	13 mmol/L	1 mmol/L
Creatinine	POSITIVE	1.1 mg/dL	0.1 mg/dL

I certify that the specimen identified by this accession number has been handled and analyzed in accordance with all applicable requirements.

Certified by: TRAVIS E. CURTIS, M.S.
Date: MAR 14 2009

----- END OF REPORT -----

Exhibit 8 to Dr. Lubarsky's Affidavit

Watching Steve Henley's execution tears at reporter's heart

The Tennessean - Nashville, Tenn.
Author: KATE HOWARD
Date: Feb 8, 2009
Start Page: n/a
Section: OPINION
Text Word Count: 1241

Document Text

Commentary

Editor's note: The Tennessean's Kate Howard, who is the newspaper's public safety reporter, covered the execution of convicted murderer Steve Henley last Wednesday morning. This is her account of covering the imposed sentence. Mark Silverman's column will return.

This morning I watched as lethal drugs flowed into the veins of a man.

Steve Henley was a murderer, or at least that's what the courts decided when they convicted him of shooting an elderly farm couple and burning down the house with their bodies inside. He lived under a death sentence for 23 years.

"I'm an innocent man."

It was the last thing he said before the warden said "Proceed," and sent him to death with just two powerful syllables.

I had spent the earlier hours at a variety of places: at a prayer vigil for Steve, where resistance songs were played and mourners bemoaned state killing at what felt like a funeral six hours premature. I stood in the 18-degree weather with a handful of early protesters, one of whom spent 20 years on death row himself before new technology made him a free man. He was opposed to any type of killing whether Steve was guilty or innocent, he said. I stood in the well-heated press tent with reporters who gave me pitying looks when they learned I was a witness, and the quiet ones who would be going in with me.

I spent an hour, an extremely awkward hour, getting shuffled with Steve's family from one concrete, clockless conference room to another while they counted down the minutes. The warden of Riverbend Maximum Security Institution had brought us into the room himself and let us know right off the bat there were no interviews on these premises. There were six of us intruding on those sacred moments, media witnesses who were told to stay silent.

But we listened while they talked about their father's fast car, the Chevelle that's since been sold that his son would give anything to drive again. His father could shift so fast, Greg Henley said, that he'd tape a $100 bill to the dashboard and offer it to you - if you could lean forward far enough to get it once he stepped on the gas. They talked about his innocence, how they couldn't believe the state was killing a good, innocent man.

We scribbled as quietly as we could with the provided pencils and notebooks, trying to record the moment as the family bowed their heads, held hands and prayed one last time for Steve.

Son says he forgives the state

His pastor, a staunch anti-death penalty advocate, said she couldn't believe this was really happening after all these years. His son Greg, who said he didn't comprehend reading that well, was repeating over and over the statement he planned to give later to the press, trying to commit it to memory.

"I forgive the state of Tennessee for executing my daddy. I forgive the state of Tennessee for executing my loving daddy. I forgive the state of Tennessee for executing my loving daddy, and I want you to know he is an innocent man."

Later, as we rounded an hour of silence on our side of the room, the press witnesses were confronted with a well-meaning question from Greg.

"Can I ask you a question? Are you guys ... are you pro-death penalty, or anti, I guess?"

Another reporter lifted his head and said the warden told us not to talk to them. Greg apologized.

His sister said that they'd know how we felt once they watched our reports and gave me in particular a knowing nod.

With that, the stony-faced guard at the door nodded to us that it was time. We walked single file through the visiting room - there was a play castle, dolls and children's toys in the corner - to a small concrete room. A row of squeaky

chairs faced a window. The blinds were drawn. Behind it was Steve, or Henley to those of us in the back.

We sat that way for 12 minutes, with the noises of preparation and shadows of prison officials leaking through. The microphone turned on. Greg stopped rocking back and forth. Steve's daughter asked for a bucket.

The blinds were lifted, and Henley was strapped to the gurney. A microphone was coming down from the ceiling for his last statement. He raised his head, turned to see his family, and stuck out his tongue. With his hands strapped down, he tried to blow a kiss. He made his statement. He said he was sorry for what Fred and Edna went through, but he didn't do it. He said he hoped this procedure would give some peace to them and their family, although he didn't believe death brought anything but pain. He said he was an innocent man.

Proceed.

His family began to sob. They stood by the window, shouted to him. He told them to quit crying, called them a pitiful bunch. He told them - perhaps his pastor especially - to never quit.

"I feel it coming," he shouted from the death chamber.

His head was already down, he snored a few times and went silent. In the witness chamber, it was chaos.

They were screaming, sobbing. His daughter began to throw up. His sister and his pastor joined together in the Lord's Prayer, so impassioned that even the pastor stumbled over the words.

I bit my lip and furiously wrote, knowing my notes were never going to match my memory or capture what was happening in that moment. The color drained from his face. He started to turn blue. And slowly it grew quiet in the witness chamber, too.

Don't cry. Don't cry.

I looked at the other reporters. They were still writing.

Soon Henley's sister turned and stared me and the others straight in the face.

"Not a tear in anyone's eye back there," she said to nobody in particular. "Don't human life mean nothing to you? You're like a pack of dogs."

Yesterday, throughout the day most of my colleagues asked me how I felt about covering this execution, watching a man die. I kept saying I wasn't sure yet. A few told me about other reporters they've known who covered them. Some were vague about the impact. Others told me I'd be traumatized.

Before it was time, I had called my boyfriend and asked him, what if I got emotional? What if I cried in front of the other reporters? He told me I would be professional and I would be real. If I cried, then I was being real about it. After all, I was watching a man die.

In truth, it probably was the only time I did successfully hold back tears. I have always been emotional, and always, during a good interview, find myself feeling my subject's emotions. It would be a lie to say I don't often wipe away a tear when interviewing people who have lost someone to murder or illness or ruthless tornadoes.

But on those days I never watched it happen. I have always come along in the aftermath, and felt the hot tears coming when I've heard about grief setting in.

This morning I watched it happen, a true rarity in the world of reporting on crime.

And today, who knows why, the tears held until I got home.

Contact Kate Howard at 615-726-8968 or kahoward@tennessean.com

Abstract (Document Summary)

The Tennessean's Kate Howard, who is the newspaper's public safety reporter, covered the execution of convicted murderer Steve Henley last Wednesday morning. Son says he forgives the state His pastor, a staunch anti-death penalty advocate, said she couldn't believe this was really happening after all these years.

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TheCityPaper

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Henley executed, maintains innocence in final words

By *southcomm*
Created *02/19/2009 - 8:53pm*

Clint Brewer & Amy Griffith Graydon

$element(flashss,slideshow,147,Nasc)$

Convicted murderer Steve Henley met his death at the hands of the state with a smile on his face and maintained his innocence even in his final moments amid the cries and prayers of his family.

"As I have said ever since this happened, I didn't kill them," Henley said during his final words of his victims, Fred and Edna Stafford. "I hope they can rest easier after this procedure is done."

Henley was pronounced dead at 1:33 a.m. today in the Riverbend Maximum Security Institute's death chamber. Henley was put to death using Tennessee' controversial three-drug protocol for lethal injection, an execution method Henley's attorneys argued was unconstitutional in last minute briefs to the U.S. Supreme Court as late as yesterday evening just hours before the appointed execution date and time.

Henley was revealed to family members and media witnesses to the execution at 1:17 a.m., already strapped to the death gurney. When he heard the shouts and cries of his family, Henley lifted his head and smiled to them.

In his final words, Henley more than once maintained his innocence in the 1985 murder of the Staffords. Henley also questioned whether his death would bring any peace to the Stafford family, noting his own family's apparent grief.

"I would like to say I hope this gives Fred and Edna's family some peace," Henley said. "In my experience in life, it won't. The death of a family member never brings anything but pain."

"I'm an innocent man," Henley added later.

From the death gurney, Henley also gently admonished his children and sister for their tears.

"Bye," Henley said, making kissing motions with his mouth to his family. "Stop that crying. Stop it. I'll see you on the other side. Ya'll are a pitiful bunch." The final comment drew laughter not only from his family but also from Henley.

In an emotionally charged death chamber with his distraught son, daughter and sister watching, Henley's execution began with the command of "proceed" from Warden Rickey Bell at 1:19 a.m.

"I feel it coming on," Henley said, and then went motionless and made noises as if he were snoring.

The death chamber then exploded in a torrent of emotions from Henley's family. Henley's grown son, Greg Henley, wept openly. His daughter, Leanne Henley, screamed, "Oh my God, no, no," as Henley began to slip away.

At one point, the entire Henley family along with their spiritual advisor Stacey Rector began saying the Lord's Prayer in unison, their voices growing louder and louder in the death chamber as the familiar prayer advanced.

At about 1:26 a.m., Henley's face began to turn blue while still strapped to the gurney. His face eventually turned purple as family members watched.

"They killed my brother for nothing!" explained an angry Stephanie Worley, Henley's sister. Worley eventually turned her anger on members of the press sitting in the death chamber as witnesses.

"I don't see a tear back here," Worley said, as she turned to face reporters. "I guess human life has no meaning anymore. Like a bunch of dogs."

It was unclear from the witness vantage point when during the almost 30 minute process Henley was given the three different drugs – one to act as an anesthetic, another to stop his breathing and a third to stop his heart.

Henley was pronounced dead 14 minutes after the execution began with the command from the warden.

"The state of Tennessee just killed an innocent man," George Henley said in the death chamber after his father had passed. "I forgive them, but two wrongs don't make a right. I hope they know that."

Henley was convicted and executed for the grisly murders in Jackson County of the Staffords in 1985. The couple was shot by Henley in a dispute over money and then placed inside their house, which he then set on fire. Edna Stafford, though shot twice, was still alive and died from injuries suffered in the blaze.

Tennessee Department of Corrections staff said a nephew of the Staffords, Jack Stafford, witnessed the execution from another room.

Henley has maintained his innocence for over two decades, saying it was the man that testified against him who actually committed the murders.

Henley was the fifth person to be executed in Tennessee since 1960 and the fourth by lethal injection. Presently, Tennessee' lethal injection protocol is the subject of a legal battle in the 6th Circuit Court of Appeals where condemned inmate Edward Harbison is trying to see an opinion from district court upheld that states Tennessee's lethal injection method constitutes cruel and unusual punishment.

Greg Henley spoke emotionally to members of the media after the execution. He and his sister, Leanne, stood arm-in-arm, appearing to hold back sobs. Greg Henley's voice broke as he maintained his father's innocence.

"I forgive the state of Tennessee for executing our loving Daddy. I want them to know I'm praying for both our side of the family, and Fred and Edna Stafford's family," Greg Henley said. "But I also want you to know, you executed an innocent man, an innocent man."

Rector said Henley was "at peace." As prospects of legally staying the execution grew bleaker as the day progressed, Rector said Henley accepted the developments and was "ready," though he maintained concerns for his family and for the Staffords' family.

"I very much believe he ministered to me far more than I ministered to him tonight," Rector told reporters. "I think what he hopes most is that story will be told now, even if he's not here, because he very much feels that it should be."

Last-minute appeals on Henley's behalf were denied, said Henley's attorney, Paul Davidson of Waller Lansden Dortch & Davis. A request made to Gov. Phil Bredesen for a 30-day reprieve was also denied. The 30-day reprieve was requested to allow for presentation of a clemency petition.

"Unfortunately, the governor made the decision not to give him that opportunity, and that ended [Hensley's] appeals tonight," Davidson said.

Near the prison, more than 60 demonstrators gathered to show their opposition to the death penalty, a turnout that surprised Tennessee Coalition Against State Killings (TCASK) field organizer Isaac Kimes. Temperatures in Nashville hovered around 15 degrees early Wednesday morning, and a light snow fell during parts of the evening. Due to the weather and to the midnight start of the demonstration, Kimes said he was very pleased with the number of people participating.

Volunteers at the event said they wouldn't be anywhere else. Some held signs, or Bibles. While TCASK is a secular organization, Kimes said the anti-death penalty movement draws a number of volunteers who oppose execution on religious grounds.

"I believe that my faith calls me to be here, and to speak out against something I don't believe in. I believe that God is love, and God is forgiveness as well," said demonstrator Menzo Faassen.

"From a religious standpoint, I don't think that anyone has the right to take another person's life, in any form or fashion. The fact that the state of Tennessee, of which I'm a citizen, is pre-meditatively taking another person's life is just incomprehensible to me. I need to be out here to stand against that," said TCASK volunteer Harry Simpson. "Tennesseans are better than this. ... I don't know why more people aren't out here."

For those at the vigil, the presence of Michael McCormick – a Tennessee man who spent 17 years on death row before being acquitted and released in 2007 – served as testimony to a legal system that sometimes makes mistakes.

"I'm here to support Steve. I'm here to support all of [those on death row]. I knew them for 20 years," McCormick said. "The system can fail. People can be executed for crimes they didn't commit. People need to keep that in mind."

City News

Exhibit 9 to Dr. Lubarsky's Affidavit

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

EDWARD JEROME HARBISON,

Plaintiff,

v.

GEORGE LITTLE, in his official capacity as Tennessee Commissioner of Correction, *et al.*,

Defendants.

No. 3:06-CV-1206

VOLUME 3

BEFORE THE HONORABLE ALETA A. TRAUGER
TRANSCRIPT OF PROCEEDINGS
September 6, 2007

APPEARANCES:

For the Plaintiff:
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those things and found nothing that was unexpected in this case.

Q. Did you examine the catheters, the IV catheters?

A. Yes.

Q. When you receive --

When your office received Mr. Coe's body, were the IV catheters still in place?

A. They were exactly as they were at the moment he was pronounced dead.

And we do that with hospital patients, as well. We want to receive them exactly as they were.

Q. And you received the syringes, as well?

A. Yes.

Q. And you found nothing irregular?

A. That's correct.

Q. Did you draw fluids?

A. Yes.

Q. Where did you draw the fluids from?

A. I drew the fluids from different locations, blood from different locations within the body. We also obtained vitreous, which is the fluid inside the eye.

We would have retrieved bile. If there was urine -- I would just need to look at the record to see if there was -- we would have obtained that, as well.

Q. Is the tox report attached to that autopsy?

a random study of 22 surgical patients, plasma thiopental concentrations ranged from 4.2 to 134 milligrams per liter, meaning there were patients who were under anesthesia with levels as low as 4.2.

If we then move on to the toxicity section on Page 1098, you notice the first thing is they reported four anesthetic deaths with a blood thiopental concentration ranging from 11 to 26 milligrams per liter. They talk about two men who got 2 grams of thiopental. And here they had post mortem heart blood concentrations of 17 and 24 milligrams per liter.

And the fact that they mention heart is significant because that deals with the issue of post-mortem redistribution, which I'm going to talk about in a moment.

The other sentence in here I thought was particularly interesting was after that it says, In self administered overdoses, blood thiopental concentrations as high as 279 and 392 milligrams per liter and as low as 6 to 14 milligrams per liter have been reported.

So they're reporting fatalities as low as 6 milligrams per liter of thiopental.

The last thing they mention in this paragraph is what's called post-mortem redistribution. What that is is a phenomenon where the level of medications in the body can change after death. And post-mortem redistribution addresses an issue where historically medical examiners would obtain

blood from the heart or the central parts of the body. But what we found was that levels of certain drugs could be artificially elevated because of reasons having to do with how the central circulation is connected.

The exact mechanism of the redistribution isn't always known. But what we've observed in cases where we obtain samples both peripherally -- meaning from a blood vessel, and typically in a leg -- and central blood is that we get different values.

And in this case they reported a post-mortem redistribution concentration ratio as high as 1.9; which would mean basically almost doubling the levels in heart blood from what they were actually in the peripheral blood.

Q. Is there support for your opinions regarding the Coe autopsy with regard to pancuronium in this text?

A. Yes.

Q. And where are they located?

A. That's located beginning on Page 837 of the text. And without spending a huge amount of time, it basically goes through similar types of sections, talking about how it's typically administered, what blood concentrations have been observed in patients who are being treated, and then what we see in cases of toxicity.

They're reporting a fatal case heart blood concentration at 0.7 milligrams per liter.

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

EDWARD JEROME HARBISON,

Plaintiff,

v.

GEORGE LITTLE, in his official capacity as Tennessee Commissioner of Correction, *et al.*,

Defendants.

No. 3:06-CV-1206

VOLUME 4

BEFORE THE HONORABLE ALETA A. TRAUGER
TRANSCRIPT OF PROCEEDINGS
September 7, 2007

APPEARANCES:

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BRUCE LEVY

having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (continued)

BY MS. CAMPBELL:

Q. Dr. Levy, was the body of Phillip Workman delivered to your office or did your office obtain his body after his execution?

A. Yes.

Q. And did you visually inspect his body?

A. In fact, in Mr. Workman's case I performed a limited form of autopsy.

Q. Did that include your visual inspection?

A. It did, yes.

Q. Did you inspect and make any determination with regard to the IV sites?

A. I did. But in Mr. Workman's case it was somewhat limited; in that given the initial court order about not examining his body, it wasn't until I think about 10 days after his execution that we actually examined his body.

At that point the blood has -- it's not clotting, but congealed, making the same kind of evaluation that you're able to do within the hours after death not possible.

The tubing itself was okay. It was inserted into veins

appropriately. But there was no way to evaluate the flow of it at that point.

Q. What about the IV catheters?

A. The catheters were appropriately placed. Yes.

MS. CAMPBELL: Thank you very much.

THE COURT: Okay. Cross.

MR. KISSINGER: Thank you, Your Honor.

CROSS EXAMINATION

BY MR. KISSINGER:

Q. Dr. Levy, it's been almost four months since you collected the fluid samples from Phillip Workman's body; is that correct?

A. That is correct. Almost four months.

Q. And it's been over a month-and-a-half since we informed you at your deposition of our interest in receiving the Workman toxicology results; isn't that right?

A. That's correct.

Q. At the time you testified --

And at that time you testified that the toxicology results from EGIS Lab and the autopsy report should be done about the end of July, didn't you?

A. That was my hope at that point. Yes, sir.

MR. KISSINGER: I ask that Dr. Levy be given Plaintiff's Exhibit 11. And it would be the Coe autopsy

Plaintiff's Exhibit 33

to

Complaint for Declaratory Judgment and Injunctive Relief

Winek Drug and Chemical Blood Levels

Winek's Drug & Chemical Blood-Level Data 2001

Prepared by: Charles L. Winek, Ph.D., Wagdy W. Wahba, Ph.D., Charles L. Winek, Jr., B.S. (Pharm.), M.S., and Tracey Winek Balzar B.S. (Pharm.), M.S.

We have gathered the data in the table from the literature and from personal experience. The values are not considered absolute, but are to be used as a guide in evaluating a given case. The values can be affected by dose, route of administration, absorption differences, age and sex, tolerance, method of analysis, pathological or disease state, postmortem redistribution, etc. Users of the table are referred to *Winek's Toxicology Annual* and Chapter 72 in *Forensic Medicine,* Volume III, by Tedeschi, Eckert and Tedeschi for chapters discussing the data, reference to the data, and factors affecting blood-level values. For additional pharmacokinetic information and other tissue levels, users are referred to Baselt's reference, *Disposition of Toxic Drugs and Chemicals in Man.*

Users are cautioned against pharmacists using pharmacokinetics for interpretation of blood-level data when death is involved. It should be obvious that kinetics, even pharmacokinetics, are not applicable to the moribund state.

Definition of Blood Levels

Therapeutic Blood Level

Winek defines a therapeutic blood level as that concentration of drug and/or its active metabolite(s) present in the blood (serum or plasma) following therapeutically effective dosage in humans.

Toxic Blood Level

The concentration of drug and/or its active metabolite(s) or chemical present in the blood (serum or plasma) that is associated with serious toxic symptoms in humans.

Lethal Blood Level

The concentration of drug and/or its active metabolite(s) or chemical present in the blood (serum or plasma) that has been reported to cause death, or is so far above reported therapeutic or toxic concentrations, that one can judge that it might cause death in humans.

Normal Blood Level

Some of the values under normal represent normal body constituents and others represent values related to normal environmental exposure. Values can, and do, vary with geographical location.

Suggested additions or corrections can be made by contacting the author at drwinek@aol.com. Recommendations are always welcomed.

Units:

Drugs and chemicals in the table are reported in both mg% and µg/mL. Drugs are listed by both their trade and generic names. Mg% (milligram percent) is equal to mg/dL (milligram/deciliter); µg/mL (microgram/milliliter) is equal to mg/L (milligram/liter).

NOTE:

Divide the mg% level by 100 to obtain mg/mL Divide the µg% level by 100 to obtain µg/mL. To convert mg/L or µg/L to mg% or µg%, divide level by 10.

Examples:

1mg/L = 0.1mg%

3µg/L = 0.3µg%

µg is the representation for microgram (mcg).

Many therapeutic drugs are reported in nanograms/milliliter (ng/mL). To convert the listed mcg/mL in this table to ng/mL, multiply the listed value by 1000. For example, digoxin concentration of 0.0022 mcg/mL would be 0.0022 x 1000 = 2.2 ng/mL. Put simply, you move the decimal point three places to the right.

Dr. Charles L. Winek

Dr. Winek is a professor of toxicology at Duquesne University School of Pharmacy and also teaches for the University's School of Education, Graduate School of Arts and Sciences, and the Law School. He is a diplomate of both American Board of Forensic Toxicology and the Academy of Toxicological Sciences.

Dr. Winek is currently the director of Pittsburgh Criminalistics Laboratory and is the former chief toxicologist for the Allegheny County Coroner's Office, positions he held for 32 years. He continues to testify frequently as an expert witness in both criminal and civil cases in Allegheny County and throughout the United States.

Dr. Winek has published 119 articles in scientific journals and authored, co-authored or contributed to 29 books.

Additionally, Dr. Winek is toxicology editor for the scientific journal *Forensic Science International* and a member of the editorial boards of *The Journal of Applied Toxicology* and the journal *Analytical Toxicology.*

(**NOTE:** *Winek's Drug & Chemical Blood-Level Data 2000* is reprinted with written permission as a courtesy to our customers. Fisher HealthCare accepts no responsibility for the accuracy of its contents.)

Drug and Chemical Blood Level Data - 2001

DRUG	Therapeutic or Normal		Toxic		Lethal	
	mg%	ug/ml	mg%	ug/ml	mg%	ug/ml
P						
Pancuronium (Pavulon)	0.009 - 0.022	0.09 - 0.22	*****	*****	0.16	1.6
Papaverine	0.025 - 0.400	0.25 - 4.00	*****	*****	*****	*****
Paradione (Paramethadione)	0.11 - 0.50	1.1 - 5.0	*****	*****	*****	*****
Paraldehyde	2.0 - 33.2	20 - 332	20 - 40	200 - 400	>50	>500
Paramethadione (Paradione)	0.11 - 0.50	1.1 - 5.0	*****	*****	*****	*****
Para-Methoxyamphetamine (PMA)	*****	*****	*****	*****	0.02 - 0.49	0.2 - 4.9
Paraquat	*****	*****	0.06 - 0.32	0.6 - 3.2	>1.5	>15
Parathion	*****	*****	*****	*****	0.05 - 3.40	0.5 - 34.0
Parnate (Tranylcypromine)	0.005	0.05	*****	*****	*****	*****
Paroxetine (Paxil)	0.0031 - 0.0062	0.031 - 0.062	*****	*****	0.14 - 0.34	1.4 - 3.4
Pavulon (Pancuronium)	0.009 - 0.022	0.09 - 0.22	*****	*****	0.16	1.6
Paxil (Paroxetine)	0.0031 - 0.0062	0.031 - 0.062	*****	*****	0.14 - 0.34	1.4 - 3.3
PCP (Phencyclidine)	*****	*****	0.0007 - 0.0240	0.007 - 0.240	0.1 - 0.5	1 - 5
Pemoline (Cylert)	0.07 - 0.62	0.70 - 6.2	*****	*****	*****	*****
Pentachlorophenol	*****	*****	*****	*****	>4.6	>46
Pentazocine (Talwin)	0.003 - 0.100	0.03 - 1.00	0.2 - 0.5	2 - 5	>0.03	>0.3
Pentobarbital (Nembutal)	0.1 - 0.3	1 - 3	>0.5	>5	1.0 - 16.9	10 - 169
Pentothal (Thiopental)	0.1 - 4.2	1 - 42	>0.7	>7	1 - 40	10 - 400
Pentoxifylline (Trental)	0.006 - 0.16	0.06 - 1.6	*****	*****	>0.6	>6.0
Pepcid (Famotidine)	0.0007 - 0.0035	0.007 - 0.035	*****	*****	*****	*****
Percodan (Oxycodone)	0.001 - 0.010	0.01 - 0.10	0.02 - 0.50	0.2 - 5.0	*****	*****
Perphenazine (Trilafon)	0.00004-0.00300	0.0004 - 0.0300	0.1	1	*****	*****
Phenacetin	0.01 - 2.00	0.1 - 20.0	>3	>30	*****	*****
Phencyclidine (PCP)	*****	*****	0.0007 - 0.0240	0.007 - 0.240	0.1 - 0.5	1 - 5
Phendimetrazine	0.002 - 0.024	0.02 - 0.24	*****	*****	*****	*****
Phenelzine (Nardil)	0.0001 - 0.0002	0.001 - 0.002	*****	*****	>0.15	>1.5
Phenergan (Promethazine)	0.0006 - 0.0099	0.006 - 0.099	*****	*****	0.24 - 1.2	2.4 - 12
Phenmetrazine	0.004 - 0.024	0.04 - 0.24	*****	*****	0.4	4
Phenobarbital	1 - 4	10 - 40	4 - 6	40 - 60	>8	>80
Phenol	*****	*****	*****	*****	>4.6	>46
Phensuximide (Milontin)	0.4 - 1.4	4 - 14	8 - 15	80 - 150	*****	*****
Phentermine (Ionamin)	0.009 - 0.051	0.09 - 0.51	*****	*****	0.15 - 0.76	1.5 - 7.6
Phenylbutazone (Butazolidin)	1.6 - 15.0	16 - 150	20	200	40	400
Phenylephrine (Neo-Synephrine)	0.003	0.03	*****	*****	*****	*****
Phenylpropanolamine	0.003 - 0.048	0.03 - 0.48	*****	*****	>1	>10
Phenytoin (Dilantin, Diphenylhydantoin)	1 - 2	10 - 20	2 - 5	20 -50	>10	>100
Phisohex (Hexachlorophene)	0.0003 - 0.0650	0.003 - 0.650	*****	*****	0.22 - 3.5	2.2 - 35
Phosphorus (Adult)	2.0 - 4.8	20 - 48	*****	*****	*****	*****
Phosphorus (Child)	4 - 7	40 -70	*****	*****	*****	*****
Piroxicam (Feldene)	0.085 - 0.8	0.85 - 8.00	*****	*****	*****	*****
Placidyl (Ethchlorvynol)	0.05 - 0.88	0.5 - 8.8	*****	*****	2.2 - 21.3	22 - 213
Plaquenil (Hydroxychloroquine)	0.0019 - 0.0210	0.019 - 0.210	*****	*****	6.1	61
Plendil (Felodipine)	0.00015-0.00088	0.0015 - 0.0088	0.001 - 0.0015	0.01 - 0.015	*****	*****
PMA (Para-Methoxyamphetamine)	*****	*****	*****	*****	0.02 - 0.49	0.2 - 4.9
Polythiazide (Renese)	0.2 - 0.7	2 - 7	*****	*****	*****	*****
Pondimin (Fenfluramine)	0.004 - 0.030	0.04 - 0.3	0.07 - 0.09	0.7 - 0.9	0.6 - 1.5	6 - 15

Plaintiff's Exhibit 34

to

Complaint for Declaratory Judgment and Injunctive Relief

James Ramsey 2006 Affidavit

AFFIDAVIT OF JAMES J. RAMSEY

County of Davidson)
)
State of Tennessee)

I. My name is James J. Ramsey. I presently reside at 466 Rodney Street, Gallatin, Tennessee 37066.

II. I am a Licensed Clinical Perfusionist (LCP). Perfusionists perform and monitor the initiation, maintenance, and discontinuation of cardiopulmonary bypass (CPB) and other circulatory support technologies, commonly referred to as 'heart-lung' bypass procedures. I have been so certified (now licensed in the State of Tennessee pursuant to T.C.A. Section 63-28-101 et seq.) and practicing Perfusion Care since my graduation from Vanderbilt's Program in 1984, and to date have participated in approximately five thousand (5000) clinical applications of heart-lung machine and other circulatory support technologies.

III. I am currently employed by the Department of Cardiac and Thoracic Surgery, School of Medicine, Vanderbilt University Medical Center, Nashville, Tennessee. My position is that of Program Director for the post-graduate Allied Health Program in Cardiovascular Perfusion Technology. I have held that position for the past eight (8) years, and previously held that position from 1986 - 1989.

IV. I am an attorney, licensed to practice and currently practicing in the State of Tennessee. My BPR # is 16263.

V. Regarding my clinical practice during CPB, one of the clinical functions (and statutory duties) of the LCP is that of '....myocardial and (other) organ preservation', which in simple terms as related to CPB involves the application of appliance technologies

directed at the arrest of (stopping the beating of) the human and animal heart, preserving its function during the arrest period so as to enable it to function adequately following the arrest interval, modifying the re-perfusion of the arrested heart, and re-establishment of the function of the heart to a beating, working state. As a licensed perfusionist, I am also certified to undertake physiologic monitoring and analysis, as well as blood gas and chemistry monitoring and analysis. For nearly all of the clinical cases I have performed, it has been my duty to arrest the electromechanical function of the heart through a variety of means. For purposes of this affidavit, I will address only the actual electrical arrest of the beating human or animal heart.

VI. As a preface, it is my professional opinion, based upon my knowledge, training, and experience in the field of Perfusion Care and especially in the area of myocardial arrest, and my review of the Tennessee execution protocol, that the potassium component of the lethal injection protocols currently used by the State of Tennessee (200 mEq delivered intravenously) is wholly ineffective in causing electrical arrest of the human heart. Furthermore it is a pathophysiological impossibility, based upon well-established and accepted mathematical equations, for the heart to succumb to electrical arrest due to the potassium component of the lethal injection protocol. The loss of function of the heart, if and when it does arrest during lethal injection, is entirely due to suffocation and lack of oxygen delivery, and not electrical arrest due to potassium injection. I hold this opinion within a reasonable degree of scientific certainty.

VII. The chemical compositions of extracellular and intracellular fluids are described in Exhibit #1. Based upon the relative concentrations of especially sodium (Na+), calcium

(Ca++), and potassium (K+) ions inside and outside the cell, the 'resting membrane potential' of any living cell (and especially cells of 'excitable' tissue - nerves and muscles) is described by the Nernst Equation (see Exhibit #2).

VIII. This electrical voltage of an excitable cell is commonly referred to as the 'action potential' for excitable cells, and is based upon the fact that at some point (generally due to some kind of electrical or other stimulus) the action potential of excitable tissues and cells can change, resulting in an alteration of the electrical potential. This alteration causes an action (in nerves, conduction of an electrical impulse, or in muscles, a contraction of the muscle fibers).

IX. Application of the Nernst Equation may result in calculations for the various action potentials attributable to sodium, potassium, and calcium (see Exhibit #3 and #4). However, the Nernst Equation does not take into account the fact that the cell membranes of excitable tissue exhibit properties of varying states of permeability, relative to their structure and function. Permeability to ions results in a dynamic component regarding the action potential and its calculation.

X. Further inquiry must include calculations that take into account the resting ionic permeability for sodium, potassium, and calcium regarding excitable cells, in order to accurately calculate the action potential of excitable cells. The Goldman-Hodgkin-Katz Equation describes the calculation of action potential for excitable cells, inclusive of the factor referred to above as resting ionic permeability (see Exhibit #5).

XI. A calculated action potential of -86 mV is derived from that formula (see Exhibit #6 and #7).

XII. However, the inquiry is not yet complete, because there is a phenomenon referred to as the 'sodium-potassium pump' that is present in the cell membranes of excitable cells (see Exhibit #8). The sodium-potassium pump is an active-transport mechanism (not a passive mechanism) that causes the continuous pumping of sodium and potassium in and out of the cell in order to establish and maintain the action potential. The net effect of the sodium-potassium pump, from an electrical perspective, results in a loss of positive charges from inside the cell, creating an additional negativity (-4 mV) across the cell membrane.

XIII. By adding the -4mV attributable to the sodium-potassium pump to the -86 mV action potential as calculated by the Goldman-Hodgkin-Katz Equation, a net action potential of -90mV is determined. This is in fact the physiological action potential for excitable cells (see Exhibits #9 and #10).

XIV. Excitable cells in that resting state of -90 mV action potential are said to be 'polarized', that is, they are not in an electrically neutral state. In fact, the reason for the polarized condition is as previously stated: the cells being excitable, they are subject to and capable of causing an action of some kind (nerve impulse or muscle contraction).

XV. Polarized cells are said to be in a resting state; that is, there is no action occurring as long as the action potential remains at -90 mV.

XVI. Excitable cells that undergo a change in action potential may become depolarized; that is, the action (resting) potential of the cell changes due to a stimulus, with the net electrical effect being that the -90mV potential is increased (becomes less negative). At the point that that the potential reaches the level of -65mV, the cell becomes depolarized.

At this point, the characteristics of the cell membrane undergo radical changes of permeability, with sodium rushing into the cell through what are called sodium channels, and later potassium leaving the cell through a similar mechanism.

XVII. The important point here is that these changes result in dramatic changes in electrical status, and as demonstrated in Exhibit #11 and #12, an electrical action occurs (change in cell polarization from negative to positive). Soon afterwards (milliseconds in time) the cell membrane potential is caused to become negative again, based upon among other things the active transport mechanisms associated with the cell membrane, and following the 'action' of the cell, it again reaches a resting state, with its resting potential now found to be -90mV (just as before its action or stimulus).

XVIII. The same mechanism occurs in myocardial cells, as described in Exhibit #12, with several important differences. In the case of myocardial cells ('Cardiac Muscle'), the depolarization of the cells results in a muscle contraction rather than an electrical impulse (nerves). Secondly, calcium ions play a major role in the process, as calcium is an important contributor to the actual 'shortening' of the muscle fibers, characteristic of muscle contraction. Following the depolarization of myocardial cells, a re-polarization occurs, with the cell again returning to its resting state.

XIX. The question becomes -if we are to stop this process from occurring (arresting the heart so that the cells do not depolarize and therefore the myocardial fibers do not contract), how are we to accomplish this?

XX. Based upon the science as previously described, there are two means of accomplishing this: (1) remove sodium from the extracellular space so that it cannot rush into the cell

and depolarize it; or (2) alter the membrane potential to prevent the opening of the sodium channels, thereby preventing sodium from rushing into the cell causing depolarization.

XXI. Based upon the very high extracellular concentration of sodium (see Exhibit #1), it would be impractical to remove enough sodium so as to prevent depolarization as described in method #1 above.

XXII. It is possible, however, to alter the membrane potential of excitable (myocardial)cells so as to prevent the opening of the sodium channels, thereby preventing sodium from rushing into the cells causing depolarization (in effect, stopping the beating and squeezing of the heart).

XXIII. In order to do that, it is possible to add enough potassium to the extracellular fluid space so that the action potential of -65mV as previously described is no longer a factor, and that the resting potential of the cell (previously -90mV) is raised (made more positive) such that the sodium channels never open, and a state of depolarization never occurs.

XXIV. By applying the Goldman-Hodgkin-Katz Equation and solving for a potassium solution that would raise the resting potential of the myocardial cell from -90mV to -56 mV (taking into account the target of -60 mV and accounting for the -4mV attributable to the sodium-potassium pump), we find that the minimum effective extracellular potassium concentration necessary to prevent the opening of sodium channels in the cell membrane as previously described is 16.4 mEq/L. (See Exhibit #13).

XXV. It should be noted, per Exhibit #1, that the normal extracellular potassium concentration is in the range of 4 mEq/L.

XXVI. When the extracellular potassium concentration is 16.4 mEq/L or greater, the sodium channels will not open, there will be no net effective change in membrane potential, and no action potential or change of electrical status as previously described will occur. The net result: the myocardial muscle fibers will not shorten, and the heart will not beat.

XXVII. In the operating room, the common method for infusing potassium-rich solutions into the heart so as to cause the heart to cease function is as follows:

a. High potassium solutions (20 mEq/L) are administered directly into the coronary arteries, both in a forward direction (antegrade) and in a backward direction (retrograde). This methodology insures that all segments of myocardial tissue (regardless of native supply being disrupted due to atherosclerotic disease) are exposed to the high potassium solutions.

b. High potassium solutions are delivered in both directions as well because often times patients have insufficiency of the aortic valve, which results in the inability of the antegrade delivery method to adequately perfuse myocardial tissues through the coronaries (the flow that would otherwise go through the coronaries is redirected into the left ventricle in that case).

c. High potassium solution is delivered in a profoundly hypothermic state; that is, at approximately 5-7 degrees Celsius (or nearly freezing, as opposed to normal body temperature of 37 degrees Celsius). The net effect of hypothermic delivery is an enhanced state of cellular arrest (see the temperature component as stated in the previous formulae).

d. High potassium solution is delivered at precise pressures, as measured both at the site

of delivery, and at the appliance delivering the device ('back-pressure'), to insure adequate and effective delivery, and in the case of the operating room, adequate electrical arrest of the heart in order to preserve its function.

XXVIII. In spite of these extensive and precise efforts, it is in my experience still difficult to achieve adequate arrest of the heart for surgical purposes in some cases.

XXIX. The lethal injection process as described in the discovery documents reviewed does not describe a precise or extensive effort to deliver the potassium solution to the heart - rather, they describe a crude and imprecise method of delivery through IV injection, with the profoundly inaccurate expectation that potassium solution in high concentrations would reach the coronary arteries and effect an arrest. One of the main contributing factors to low potassium concentration solutions reaching the heart would be that, given an intravenous injection, the solution would necessarily have to pass through the lungs (which have the surface area of approximately that of a tennis court), during which potassium concentrations would fall dramatically.

XXX. Additionally, discovery documents (from State of Tennessee) describe that the amount and concentration of potassium delivered cannot result in the minimum potassium concentration of 16.4 mEq/L being achieved that is required to arrest the electromechanical function of the heart. The resultant potassium concentrations as described in the Vitreous Electrolyte Panel and Profile Results for inmate Robert Glen Coe, for example, following lethal injection indicate an extracellular potassium concentration of 9 mEq/L, far short of the required minimum concentration of 16.4 mEq/L to cause electromechanical arrest of the heart.

XXXI. It should be noted that given the very high intracellular potassium concentration (per Exhibit #1), and the fact that postmortem cells would, if anything, leak potassium into the extracellular space, the postmortem potassium concentration is in all likelihood higher than it was a the time following injection.

XXXII. In my professional opinion, and based upon my knowledge, training, and experience in the field of Perfusion Care and arrest of the heart's function, and following review of the disclosures by the State of Tennessee previously described, it is a pathophysiological impossibility, based upon well-established and accepted mathematical equasions, for the heart to succumb to electromechanical arrest due to the potassium component of the lethal injection protocol. The function of the heart, if and when it does arrest during lethal injection, is entirely due to suffocation and lack of oxygen delivery, and not electromechanical arrest due to potassium injection. I hold this opinion within a reasonable degree of scientific certainty.

I affirm or swear under the penalty of perjury that the foregoing is true and correct to the best of my knowledge

James J. Ramsey

Subscribed and sworn before me this 11 day of April, 2006

Tracy Monette
Notary Public, State of Tennessee

My Commission Expires: 7-21-2007

TRACY MONETTE
NOTARY PUBLIC AT LARGE
DAVIDSON COUNTY, TENN.
My Commission Expires JULY 21, 2007

Exhibit 1 to James Ramsey Affidavit

Chemical Compositions

	Extracellular*	Intracellular
Na^+	142	14
K^+	4	140
Ca^{++}	2.4	0.0001
Mg^{++}	1.2	58
Cl^-	103	4
HCO_3^-	28	10
Phosphates	4	75
SO_4^{--}	1	2

* All concentrations in mEq/L

Exhibit 2 to James Ramsey Affidavit

Nernst Equation

$$E_{ion} = V_{in} - V_{out} = 2.303 \frac{RT}{zF} \log \frac{[C_{out}]}{[C_{in}]}$$

where

T = absolute temperature in °K = °C + 273.16,

R = ideal gas constant = 8.31451 J/(mol - °K),

F = Faraday's number = 96485.3 Coulombs/mol, &

z = valence of the ion.

Exhibit 3 to James Ramsey Affidavit

Nernst Equation

At 37 °C & for an univalent ion:

$$E_{ion}\ (mV) = 61.6 \log \frac{[C_{out}]}{[C_{in}]}$$

For K^+:

$$E_{K^+} = 61.6 \log \frac{4}{140} = -95\ mV$$

Exhibit 4 to James Ramsey Affidavit

Membrane Potential - Under Construction

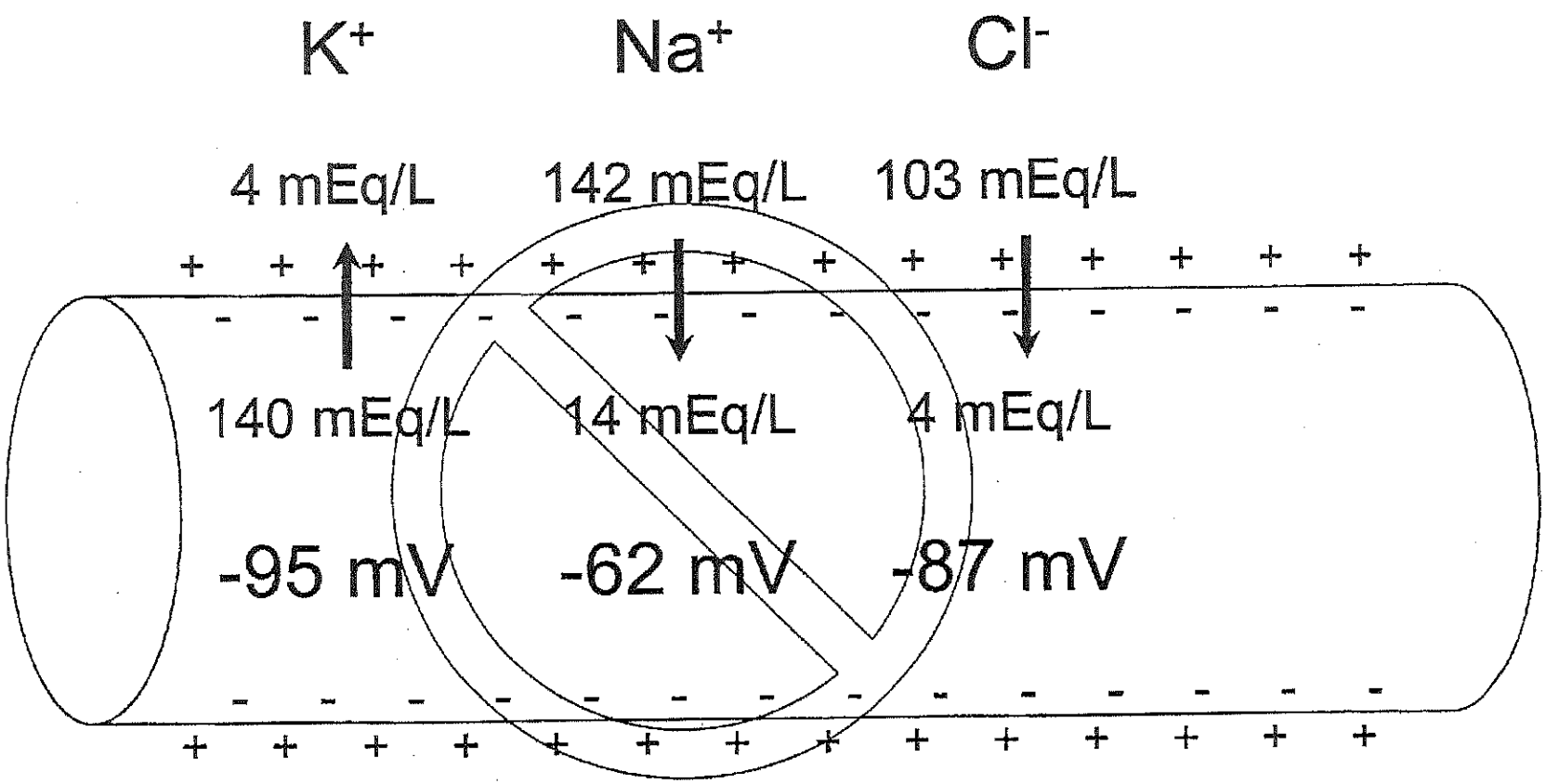


Exhibit 5 to James Ramsey Affidavit

Goldman-Hodgkin-Katz Equation

$$E\ (mV) = 2.303 \frac{RT}{F} \log \frac{[C_{K^+o}](P_{K^+}) + [C_{Na^+o}](P_{Na^+}) + [C_{Cl^-i}](P_{Cl^-})}{[C_{K^+i}](P_{K^+}) + [C_{Na^+i}](P_{Na^+}) + [C_{Cl^-o}](P_{Cl^-})}$$

where

T = absolute temperature in °K = °C + 273.16,

R = ideal gas constant = 8.31451 J/(mol - °K),

F = Faraday's number = 96485.3 Coulombs/mol, &

P = ionic permeability.

Exhibit 6 to James Ramsey Affidavit

Goldman-Hodgkin-Katz Equation

At 37 °C & with resting ionic permeabilities of 1 for K^+, 0.0115 for Na^+, & 0.1 for Cl^-:

$$E_{REST}\ (mV) = 61.6 \log \frac{[4](1) + [142](0.0115) + [4](0.1)}{[140](1) + [14](0.0115) + [103](0.1}$$

$$= 61.6 \log \frac{6.033}{150.461} = -86\ mV$$

Exhibit 7 to James Ramsey Affidavit

Membrane Potential - Construction Proceeding

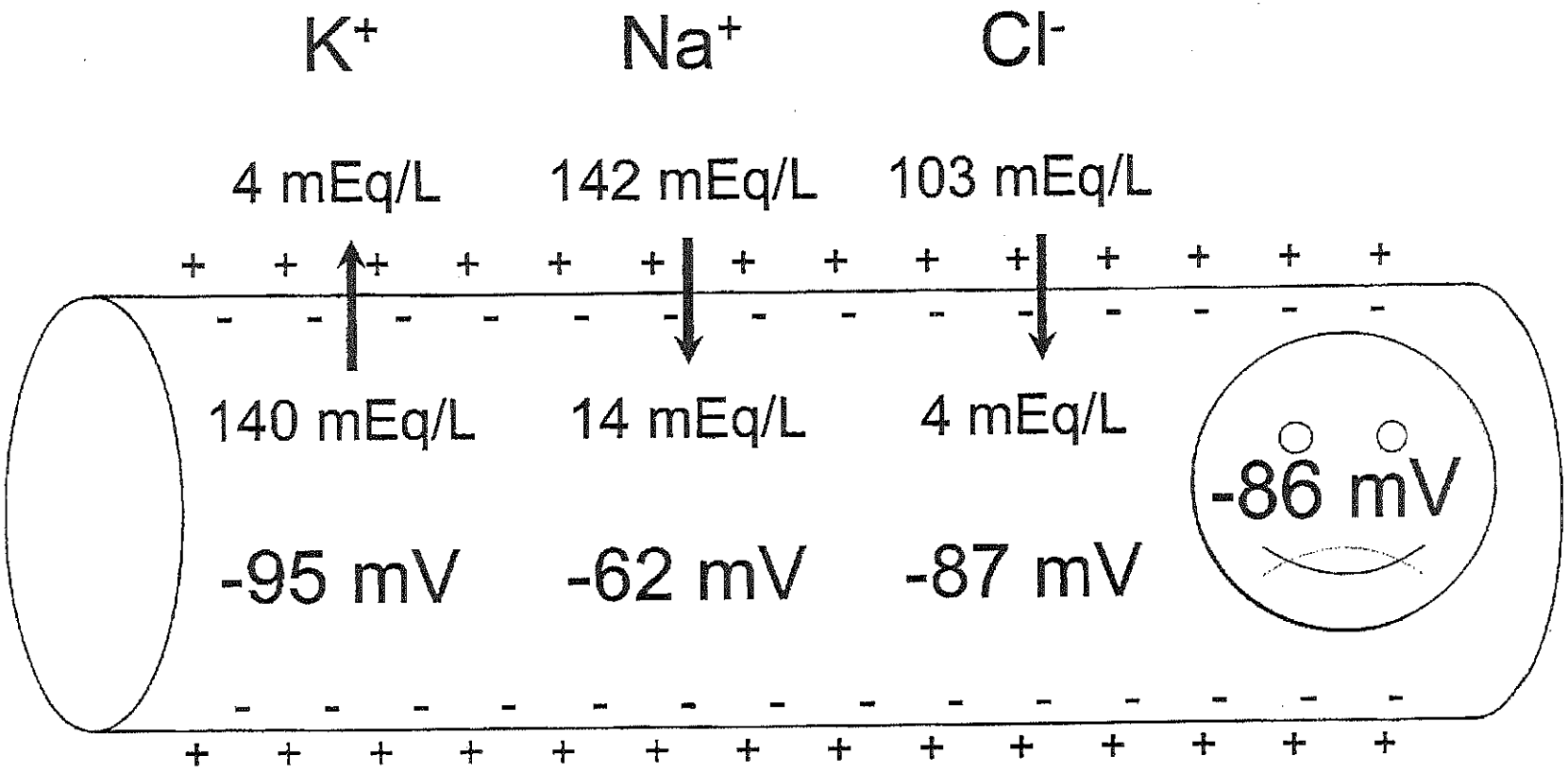


Exhibit 8 to James Ramsey Affidavit

Sodium / Potassium Pump

- Cell membrane more permeable to K^+ than Na^+ so K^+ leaks out
- Continuous pumping of 3 Na^+ out of cell for every 2 K^+ into cell
- More positive ions being pumped out than in
- Results in loss of positive charges from inside cell
- Creates an additional negativity (-4 mV) across cell membrane

Exhibit 9 to James Ramsey Affidavit

Membrane Potential - Construction Complete

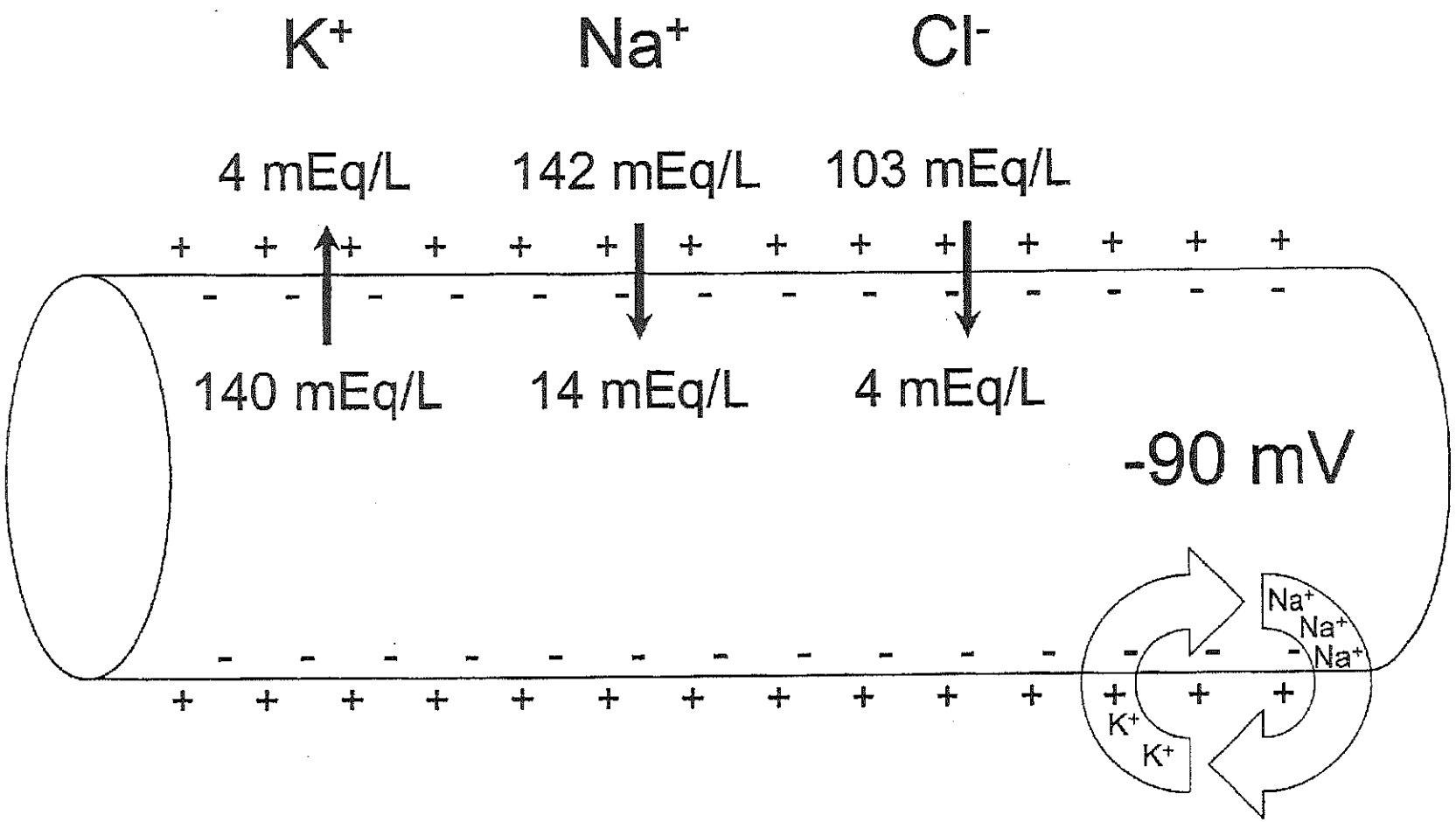


Exhibit 10 to James Ramsey Affidavit

Resting Membrane Potential

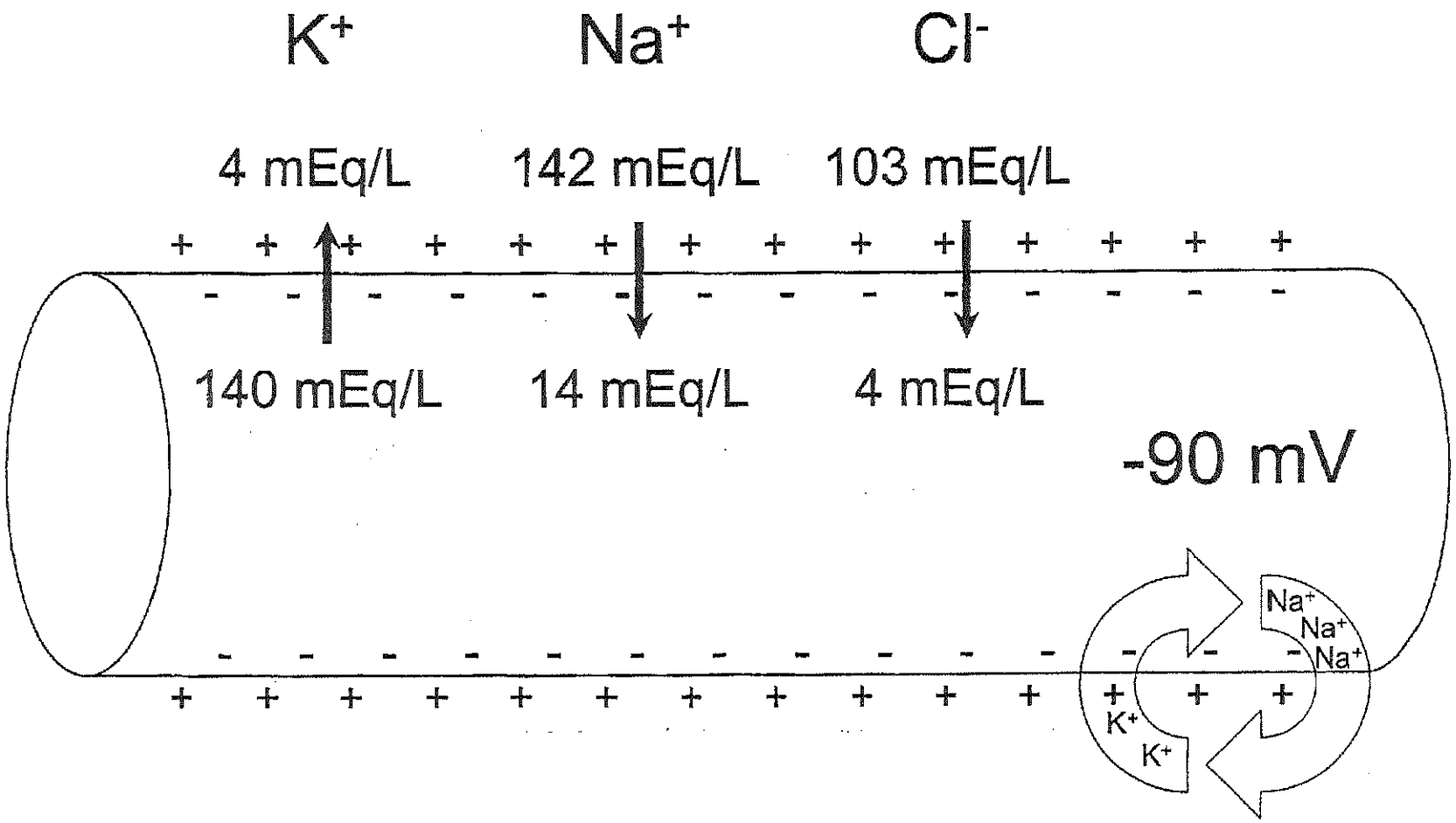
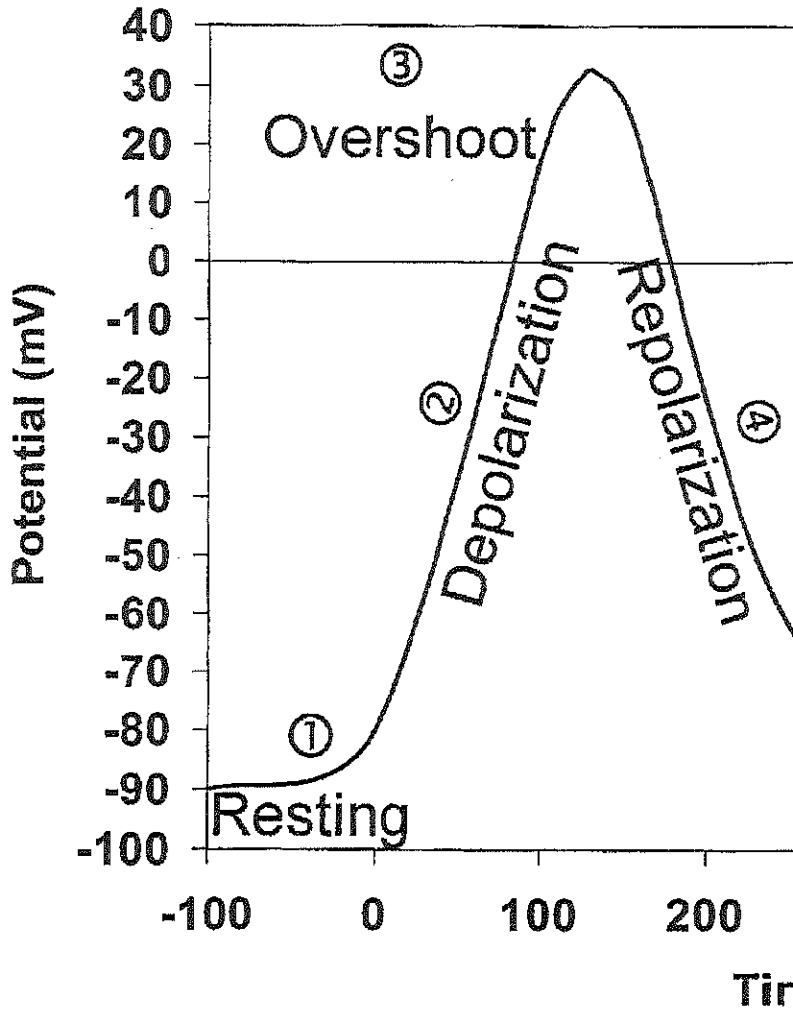


Exhibit 11 to James Ramsey Affidavit

Nerve Action Potential



① Membrane polarized @ -90 mV

② Trigger initiated; threshold reached; membrane suddenly permeable to Na^+ by opening Na+ channels; Na^+ rushes into cell

③ Magnitude of positive potential dictated by type & size of nerve cell

④ Na^+ channels close; K^+ channels more permeable; K^+ leaves cell; resting potential of -90 mV returned; Na^+ / K^+ pump returns concentration gradients

Exhibit 12 to James Ramsey Affidavit

Cardiac Muscle Action Potential

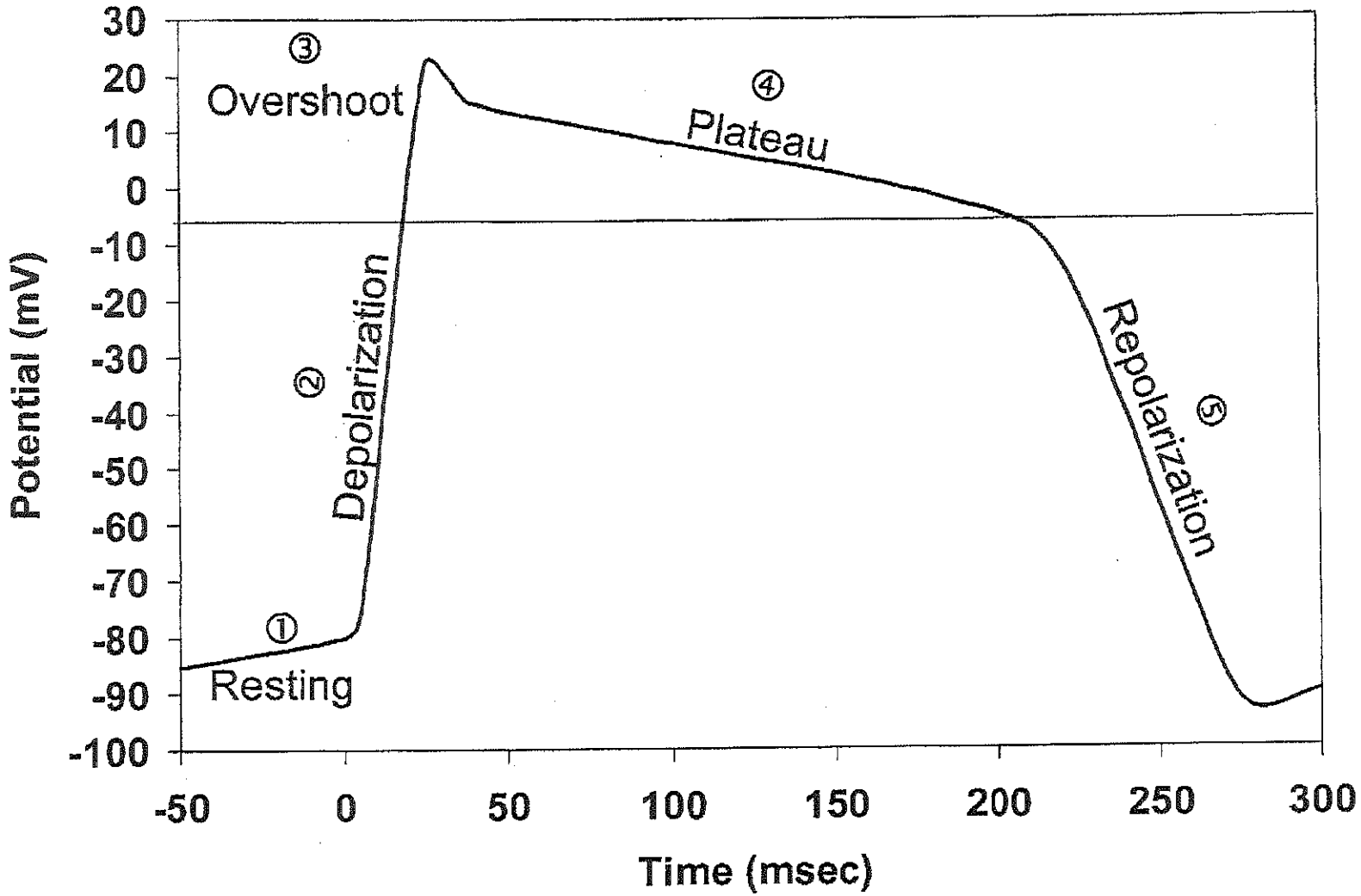


Exhibit 13 to James Ramsey Affidavit

Hyperkalemic Cardioplegia
- Minimal Effective Concentration

Alter Resting Membrane Potential of -95 mV to be greater than Threshold Potential of -65 mV

- Set Target of -60 mV
- Account for -4 mV from Na^+ / K^+ Pump
- Now Target of -56 mV
- Use Goldman-Hodgkin-Katz Equation to determine extracellular [K^+

$$E\ (mV) = 2.303 \frac{RT}{F} \log \frac{[C_{K^+o}](P_{K^+}) + [C_{Na^+o}](P_{Na^+}) + [C_{Cl^-i}](P_{Cl^-})}{[C_{K^+i}](P_{K^+}) + [C_{Na^+i}](P_{Na^+}) + [C_{Cl^-o}](P_{Cl^-})}$$

$$-56\ mV = 61.6 \log \frac{[?](1) + [142](0.0115) + [4](0.1)}{[140](1) + [14](0.0115) + [103](0.1)} = 61.6 \log \frac{[?] + 2.033}{150.461}$$

$$[?] = 16.4\ mEq/L$$

Plaintiff's Exhibit 35

to

Complaint for Declaratory Judgment and Injunctive Relief

Koniaris, et al Article
Inadequate Anesthesia in Lethal Injection for Execution

Inadequate anaesthesia in lethal injection for execution

Lancet 2005; 365: 1412–14

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Anaesthesia during lethal injection is essential to minimise suffering and to maintain public acceptance of the practice. Lethal injection is usually done by sequential administration of thiopental, pancuronium, and potassium chloride. Protocol information from Texas and Virginia showed that executioners had no anaesthesia training, drugs were administered remotely with no monitoring for anaesthesia, data were not recorded and no peer-review was done. Toxicology reports from Arizona, Georgia, North Carolina, and South Carolina showed that post-mortem concentrations of thiopental in the blood were lower than that required for surgery in 43 of 49 executed inmates (88%); 21 (43%) inmates had concentrations consistent with awareness. Methods of lethal injection anaesthesia are flawed and some inmates might experience awareness and suffering during execution.

Since 1976, when the death penalty was reinstated, 959 people have been executed in the USA.[1] Lethal injection has eclipsed all other methods of execution because of public perception that the process is relatively humane and does not violate the Eighth Amendment prohibition against cruel and unusual punishment. US courts recognise "evolving standards of decency that mark the progress of a maturing society", and prohibit punishments that "involve the unnecessary and wanton infliction of pain", "involve torture or a lingering death", or do not accord with "the dignity of man".[2]

Lethal injection usually consists of sequential administration of sodium thiopental for anaesthesia, pancuronium bromide to induce paralysis, and finally potassium chloride to cause death.[3] Without anaesthesia, the condemned person would experience asphyxiation, a severe burning sensation, massive muscle cramping, and finally cardiac arrest. Thus, adequate anesthesia is necessary both to mitigate the suffering of the condemned and to preserve public opinion that lethal injection is a near-painless death. By contrast with its medical applications, however, anaesthesia in execution has not been subjected to clinical trials, governmental regulation, extensive training of practitioners, standardisation, or the supervision of peer-review and medicolegal liability. Furthermore, the American Medical Association and American Nurses Association strictly oppose participation of their members in executions. We postulated that anaesthesia methods in lethal injection might be inadequate.

To assess anaesthesia methods, we sought protocol information from the states of Texas and Virginia, where 45·4% of executions are done, by a combination of statutory records requests to the Texas Department of Criminal Justice and the Virginia Department of Corrections, along with personal interviews and sworn testimony of corrections officials involved in executions. We noted that: neither state had a record of the creation of its protocol (Texas Department of Criminal Justice Assistant General Counsel, January and February, 2004; and Virginia Department of Corrections Director of Communications, December, 2003; written communications); executioners—typically one to three emergency medical technicians or medical corpsmen—had no training in anaesthesia (Virginia Department of Corrections Director of Communications, written communication; and personal interview of a former senior Texas corrections official who witnessed 219 Texas executions: hereafter "personal interview");[4] after placement of one or two intravenous lines, executioners stepped behind a wall or curtain and remotely administered drugs to the conscious inmate (personal interview);[4] no direct observation, physical examination, or electronic monitoring took place for anaesthesia (personal interview);[4] and there was no data collection, documentation of anaesthesia, or post-procedure peer review (Virginia Department of Corrections Director of Communications, written communication; and personal interview). No assessment of depth of anaesthesia or loss of consciousness was done: apparently anaesthesia is assumed because a relatively large quantity of thiopental is specified (usually 2 g) compared with the typical clinical induction dose of 3–5 mg/kg, immediately followed by 1–1·5 mg/kg per min for maintenance; this dose equates to 270–450 mg for induction and 90–135 mg/min maintenance for a 200 lb man.

The assumption that 2 g thiopental assures anaesthesia is overly simplistic, however. First, technical difficulties or procedural errors by poorly trained executioners might hinder administration of the total dose. Second, if thiopental anaesthesia were maintained at standard infusion rates, the total dose for a 10-min procedure in a 100 kg man would be 1·3–2·0 g. Thus the dose used is not excessive for the average time from injection to death (8·4 min, SD 4·7) and might be inadequate if the process took longer.[3] Third, a person anticipating execution would be fearful, anxious, and hyperadrenergic, and would need a higher dose of thiopental than would a premedicated surgical patient. Fourth, inmates with histories of chronic substance misuse problems might have high tolerance to sedative hypnotics and would need increased doses of anaesthetic.

Because no documentation of anaesthesia in the execution chamber existed, the only available objective data were postmortem concentrations of thiopental. Texas and Virginia refused to provide such data, but we obtained autopsy toxicology results from 49 executions in

Arizona, Georgia, North Carolina, and South Carolina. Toxicology reports were generated by MedTox Laboratories (St Paul, MN) for Arizona and are available in Beardslee versus Woodford, No C-04-5381 (Northern District of California, 2004). Data from the Division of Forensic Sciences Georgia Bureau of Investigation are available in State versus Nance, Superior Court Indictment No 95-B-2461-4. North Carolina reports were obtained directly from the Office of the Chief Medical Examiner. South Carolina Law Enforcement Division Toxicology Department reports were obtained by attorney David Barron, Kentucky Department of Public Advocacy Capital Post-Conviction Unit (personal communication) and are available in Hill versus Ozmint, No 2:04-0489-18AJ (District of South Carolina, 2004). Although the protocols of all four states are similar to those of Texas and Virginia, and specify that 2 g thiopental is used, concentrations of the drug in the blood ranged from only trace amounts to 370 mg/L (median 15·5 mg/L; figure 1). Thiopental concentrations did not fall with increased time between execution and blood sample collection (data not shown), consistent with data showing that thiopental is quite stable in stored human plasma.[4]

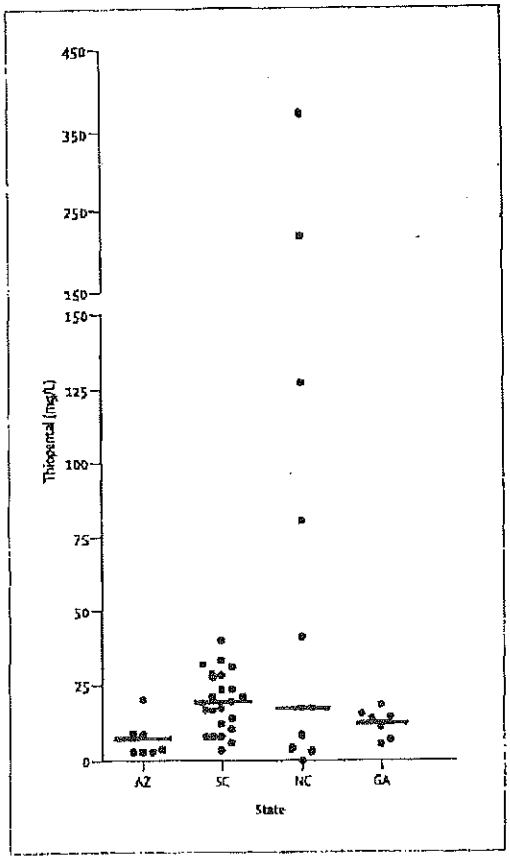

Figure 1: Individual post-mortem thiopental concentrations in blood by state

Lines show medians. Note different scales. GA sampled several sites in five individuals; the highest values are shown. GA values were reported as plus or minus 25%. AZ and SC did not report site of blood sampling. NC results were each from a single site, including subclavian artery, jugular vein, femoral vein, or vena cava.

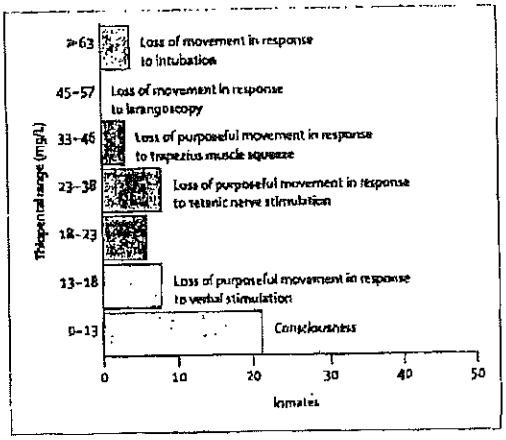

Figure 2: Number of executed inmates with post-mortem thiopental concentrations within range for indicated clinical endpoint

Ranges are 95% CI of the Cp50 for the stimuli.

Extrapolation of antemortem depth of anaesthesia from post-mortem blood thiopental concentrations is admittedly problematic. To estimate concentrations of thiopental in the brain from concentrations in the blood in life, details of the rate and duration of drug administration are needed. Unfortunately, such details are usually not specified in lethal injection protocols. Furthermore, no data about post-mortem distribution of thiopental are available. However, a large range of blood concentrations resulted from nearly identical protocols across and within individual states—from 8·2 mg/L to 370 mg/L in North Carolina for the same sampling site (subclavian artery) and similar collection times (same day or next day, respectively). This finding suggests substantial variations in either the autopsy or anaesthesia methods. Contrasting the expertise of state medical examiners with the relatively unskilled executioners, however, would strongly suggest that the variation is probably due to differences in drug administration in individual executions.

If post-mortem thiopental concentrations are taken as a surrogate marker of concentrations in the blood during life, most of the executed inmates had concentrations that would not be expected to produce a surgical plane of anaesthesia, and 21 (43%) had concentrations consistent with consciousness (figure 2). In a careful study in which actual serum thiopental concentrations were measured against clinical endpoints, the steady state serum concentration needed to produce a 50% probability of no

muscle response (Cp50) after intubation was defined as 78·8 mg/L (SD 2·9).[1] The Cp50 for movement after trapezius muscle squeeze, a stimulus equivalent to skin incision, was 38·9 mg/L (3·3). Remarkably, 43 of the 49 inmates had blood thiopental concentrations below this level. Most worryingly, 21 inmates had concentrations less than the Cp50 for repression of movement in response to a vocal command. In view of these data, we suggest that it is possible that some of these inmates were fully aware during their executions. We certainly cannot conclude that these inmates were unconscious and insensate. However, with no monitoring and with use of the paralytic agent, any suffering of the inmate would be undetectable.

With little public dialogue about protocols for killing human beings, it is pertinent to consider recommendations from animal euthanasia protocols. The American Veterinary Medical Association (AVMA) panel on euthanasia specifically prohibits the use of pentobarbital with a neuromuscular blocking agent to kill animals,[8] and 19 states, including Texas, have expressly or implicitly prohibited the use of neuromuscular blocking agents in animal euthanasia because of the risk of unrecognised consciousness.[2] Furthermore, AVMA specifies that "it is of utmost importance that personnel performing this technique are trained and knowledgeable in anaesthetic techniques, and are competent in assessing anaesthetic depth appropriate for administration of potassium chloride intravenously. Administration of potassium chloride intravenously requires animals to be in a surgical plane of anesthesia characterized by loss of consciousness, loss of reflex muscle response, and loss of response to noxious stimuli".[8] The absence of training and monitoring, and the remote administration of drugs, coupled with eyewitness reports of muscle responses during execution, suggest that the current practice of lethal injection for execution fails to meet veterinary standards.[1]

Our data suggest that anaesthesia methods in lethal injection in the USA are flawed. Failures in protocol design, implementation, monitoring and review might have led to the unnecessary suffering of at least some of those executed. Because participation of doctors in protocol design or execution is ethically prohibited, adequate anaesthesia cannot be certain. Therefore, to prevent unnecessary cruelty and suffering, cessation and public review of lethal injections is warranted.

Contributors

L G Koniaris and J P Sheldon conceived the study. J P Sheldon collected the protocol information. J P Sheldon and T A Zimmers collected the toxicology data. D A Lubarsky, L G Koniaris, and T A Zimmers assessed the protocol information and toxicology data. All authors participated in the writing and editing of the manuscript. L G Koniaris and T A Zimmers contributed equally to the work.

Conflict of interest statement

JS is an attorney who represents inmates sentenced to death. None of the other authors has a conflict of interest.

Acknowledgments

There was no special source of funding for this study.

References

1 Death Penalty Information Center. http://www.deathpenaltyinfo.org/executions.php (accessed March 17, 2005).
2 Beardslee *vs* Woodford. 395 F.3d 1064, 1070 & n.8 (9th Cir 2005).
3 Denno D. When legislatures delegate death: the troubling paradox behind state uses of electrocution and lethal injection and what it says about us. *Ohio St Law J* 2002; 63: 63–261.
4 Virginia Department of Corrections Senior Warden Charlie Davis: Testimony in Reid *vs* Johnson, Civil Action No 3:03cv1039 (Sept 1, 2004).
5 Khan A, Leventhal RM. Medical aspects of capital punishment executions. *J Forensic Sci* 2002; 47: 847–51.
6 Martens-Lobenhoffer J. Stability of thiopental and pentobarbital in human plasma determined with a new easy and specific gas chromatography-mass spectrometry assay. *Pharmazie* 1999; 54: 597–99.
7 Hung OR, Varvel JR, Shafer SL, Stanski DR. Thiopental pharmacodynamics. II. Quantitation of clinical and electroencephalographic depth of anesthesia. *Anesthesiology* 1992; 77: 237–44.
8 American Veterinary Medical Association Panel on Euthanasia. American Veterinary Medical Association. 2000 Report of the AVMA Panel on Euthanasia. *J Am Vet Med Assoc* 2001; 218: 669–96.

Plaintiff's Exhibit 36

to

Complaint for Declaratory Judgment and Injunctive Relief

Cohen Article

Lethal Injection Creator: Maybe It's Time to Change Formula

Lethal injection creator: Maybe it's time to change formula

- Lethal injection, created in late 1970s in Oklahoma, has been widely adopted
- Doctor who devised the method says drug formula may need updating
- Newer drugs might be more effective, doctor says

By Elizabeth Cohen
CNN

ATLANTA, Georgia (CNN) -- When Gary Gilmore was choosing between the firing squad and the electric chair in 1977, Dr. Jay Chapman remembers discussing the inhumanity of each option with his colleagues at the Oklahoma state medical examiner's office.

"We said this is really ridiculous. We kill animals more humanely than we kill people," said Chapman.

But Chapman, then the chief medical examiner in Oklahoma, supported the death penalty. So when state legislators asked him to come up with a more humane alternative, he went to work.

For three weeks Dr. Chapman contemplated the best way to kill someone, the best combination of drugs that when injected, would take life swiftly and painlessly.

He came up with a lethal three-drug cocktail, and to his great surprise, over the past 25 years, 37 states adopted it nearly to the letter. But now, after concerns that instead of causing an instant death it sometimes provides a slow, painful, one, Chapman has rethought whether his formula is optimal.

"It may be time to change it," Chapman said in a recent interview. "There are many problems that can arise ... given the concerns people are raising with the protocol it should be re-examined."

A recent study found sometimes inmates given lethal injections slowly suffocate while conscious but unable to communicate. Judges have ruled the procedure unconstitutional in two states, and 11 states have stopped using lethal injection.

One problem was illustrated last year when it took nearly 90 minutes to execute Joseph Clark, who'd murdered two people in Ohio. Witnesses reported that Clark raised his head off the gurney and said repeatedly, "don't work, don't work," and moaned and groaned as he struggled with prison officials.

News accounts of the execution also quoted Clark as asking, "Can you just give me something by mouth to end this?"

Chapman's protocol involves using an anesthetic to render the inmate unconscious; a paralytic to stop the inmate's breathing; and a drug to stop the heart.

One criticism has been that the anesthetic, sodium thiopental, doesn't completely anesthetize all inmates.

"Now there are other agents that work much faster and much easier," Chapman said, specifically pointing out an anesthetic called Diprivan. "Absolutely [Diprivan] would be better [for an execution]. If you're wanting to give someone something so there's no sensation, no awareness of what's going on, that's the drug."

The other major criticism of the lethal injection method has been that if the prisoner isn't completely unconscious, he will feel the asphyxiation caused by the second drug, pancuronium bromide, which paralyzes all muscles, including those needed to breathe.

When asked why he included the asphyxiation drug in his formula, Chapman answered, "It's a good question. If I were doing it now, I would probably eliminate it."

He added he wouldn't change the third drug, potassium chloride, which is highly effective at stopping the heart and causing cardiac arrest.

Chapman still stands by his formula as a sound -- if not perfect -- method of execution. "It works if it's administered competently," he said. "But you have to have some skills to do it. You have to have the ability to find a vein and mix the drugs, because [some of them] come as a powder."

He added that he's heard reports that in one execution, the IV needle was inserted incorrectly, pointing toward the prisoner's hand rather than his body. "You have to be an idiot to do that," said Chapman, who's a forensic pathologist.

He also criticized prison officials for inserting the IV inside the death chamber rather than beforehand. "It seems ridiculous to me to be trying to find a vein when everyone's inside the chamber, feeling nervous and fiddling around trying to find the vein," he said. "That's just ludicrous to me."

He also cited another "incompetency:" the execution of Angel Nieves Diaz last year that took 34 minutes because IV needles were inserted straight through his veins and into the flesh in his arms. Then-Florida Gov. Jeb Bush subsequently suspended all executions.

Even proponents of the death penalty say they have doubts about whether the three-drug formula is the best way to execute someone. "I think it's a dumb way to do it," said Michael Rushford, president of the Criminal Justice Legal Foundation, a group that advocates the death penalty. "It's a complicated procedure, and open to criticism."

Instead, Rushford said he supports using carbon monoxide, which he described as being "simple, fast, and painless."

Chapman disagreed with that assessment. But he had another idea. "The simplest thing I know of is the guillotine. And I'm not at all opposed to bringing it back. The person's head is cut off and that's the end of it."

Elizabeth Cohen is a CNN Medical News correspondent. Senior producer Jennifer Pifer and associate producer Sabriya Rice contributed to this report.

Plaintiff's Exhibit 37

to

Complaint for Declaratory Judgment and Injunctive Relief

Florida Protocol

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EXECUTION BY LETHAL INJECTION PROCEDURES

Effective for executions after May 9, 2007

PURPOSE: To establish the procedures for the execution by lethal injection of inmates sentenced to death.

DEFINITIONS:

(1) **Execution team**, where used herein, refers to correctional officers and other persons who are selected by a warden designated by the Secretary to assist in the administration of an execution by lethal injection, and who have the training and qualifications, including the necessary licensure or certification, required to perform the responsibilities or duties specified.

(2) **Executioner**, where used herein, refers to a person 18 years of age or older, who is selected by the warden to initiate the flow of lethal chemicals into the inmate.

(3) **Warden**, where used herein, refers to the warden designated by the Secretary. The warden has the final and ultimate decision making authority in every aspect of the lethal injection process. No deviation from any part of this procedure is authorized unless approved and directed by the warden.

SPECIFIC PROCEDURES:

(1) **Receipt of Warrant**: These execution procedures will commence upon receipt of the Governor's Warrant of Execution. The warden will schedule the execution for a date and time certain that is within the period of time designated in the warrant. The warden will provide a copy of the Warrant of Execution to the department's Secretary and General Counsel, deliver a copy to the named inmate, and notify the Florida Department of Law Enforcement, any state correctional institutions, and any local agencies that may be affected by the issuance of the warrant and of the date and time selected for the execution.

(2) **Selection of the Executioners**:

(a) The warden will select two (2) executioners who are fully capable of performing the designated functions to carry out the execution. The warden will provide each executioner with a copy of this procedure and will explain fully their respective duties and responsibilities. The identities of the executioners will be kept strictly confidential as provided by statute.

(b) The warden will designate one of the selected executioners as the primary executioner and the other as the secondary executioner. The primary executioner will be solely responsible for initiating the flow of lethal chemicals into the inmate during the

execution. The secondary executioner will be present and available during the execution to assume the role of the primary executioner if the primary executioner becomes unable for any reason, as determined by the warden, to carry out his/her functions.

(3) **Selection of the Execution Team**: The warden will designate the members of the execution team and verify that each member has the training and qualifications, and possesses the necessary licensure or certification, required to perform the responsibilities or duties specified. The warden will ensure that all members of the execution team and other involved staff have been adequately trained to perform their requisite functions in the execution process. The identities of the members of the execution team are strictly confidential.

(a) Security team members: Security staff shall be responsible for moving the condemned inmate to the execution gurney. Once the inmate is restrained on the gurney, only a necessary number of security team members, as determined by the warden, shall remain in the execution chamber.

(b) Technical team members: The warden shall select personnel to perform the technical procedures needed to carry out an execution by lethal injection, including the mixing of the chemicals and placement of the intravenous access lines.

(4) **Training of the Execution Team and Executioners**: There shall be sufficient training to ensure that all personnel involved in the execution process are prepared to carry out their roles for an execution. The warden, or his/her designee, will conduct simulations of the execution process on a quarterly basis at a minimum or more often as needed as determined by the warden. Additionally, a simulation shall be conducted the week prior to any scheduled execution. All persons involved with the execution should participate in the simulations. If a person cannot attend the simulation, the warden shall provide for an additional training opportunity or otherwise ensure that the person is adequately trained to complete their assigned task. The simulations shall anticipate various contingencies. There shall be a written record of any training activities.

(5) **Use of Checklists**: Compliance with this procedure will be documented on appropriate checklists. Upon completion of each step in the process, the responsible member of the execution team will place an identifier in the appropriate space to indicate that the step has been completed. Prior to the administration of the lethal chemicals, the warden will consult with the designated team member and verify that all steps in the process have been performed properly. At the conclusion of the process, the warden will again consult with the designated team member and verify that the remaining steps in the process were performed properly. The warden will then sign the forms, attesting that all steps were performed properly.

(6) **Purchase and Maintenance of Lethal Chemicals**: A designated member of the execution team will purchase, and at all times ensure a sufficient supply of, the chemicals to be used in the lethal injection process. The designated team member will ensure that the lethal chemicals have not reached or surpassed their expiration dates. The lethal chemicals will be stored securely at all times as required by state and federal law.

(7) **FDLE Monitors:**

(a) Two FDLE agents shall serve as monitors and shall be responsible for observing the actions of the execution team and the condition of the condemned inmate at all times during the execution process.

(b) The first FDLE agent shall be located in the Executioner's Booth, and the agent's responsibilities are to include documenting and keeping a detailed log as to what occurs in the Executioner's Booth at a minimum of two minute intervals. The log shall be available at the post execution debriefings.

(c) The second FDLE agent shall be located in the Execution Chamber, and will be responsible for keeping a detailed log of what is occurring in the Execution Chamber at a minimum of two minute intervals. The log shall be available for the post execution debriefings.

(8) **Approximately One (1) Week Prior to Execution:**

(a) The warden will designate one or more members of the execution team to review the inmate's medical file and to make a limited physical examination of the inmate to determine whether there are any medical issues that could potentially interfere with the proper administration of the lethal injection process. The team member(s) will verbally report his/her findings to the warden as soon as is practicable following the file review and physical examination. The results of this examination shall be documented in the inmate's file. After reviewing the results of the examination which should include a determination of the best access site, the warden shall determine, what is the more suitable method of venous access (peripheral or femoral) for the lethal injection process given the individual circumstances of the condemned inmate.

(b) If a team member reports any issue that could potentially interfere with the proper administration of the lethal injection process, the warden will consult with any or all of the members of the execution team and resolve the issue.

(9) **On the day of execution:**

(a) A food service director, or his/her designee, will personally prepare and serve the inmate's last meal. The inmate will be allowed to request specific food and non-alcoholic drink to the extent such food and drink costs forty dollars ($40) or less, is available at the institution, and is approved by the food service director.

(b) The inmate will be escorted by one or more correctional officers to the shower area where the chief of security will supervise the showering of the inmate. If the inmate is a female and the chief of security is male, the chief of security will designate a female to supervise the showering of the inmate. Immediately thereafter, the inmate will be returned to his/her assigned cell and issued appropriate clothing. A designated member of the execution team will obtain and deliver the clothing to the inmate.

(c) A designated member of the execution team will ensure that the telephone in the execution chamber is fully functional and that there is a fully-charged, fully-functional cellular telephone in the execution chamber. Telephone calls will be placed from the telephone to ensure proper operation. Additionally, the member of the team shall ensure that the two-way audio communication system and the visual monitoring equipment are fully functional.

(d) A designated member of the execution team will ensure that the public address (P.A.) system is fully functional.

(e) The only staff authorized to be in the Execution Chamber area are members of the execution team and others as approved by the warden, including two monitors from the Florida Department of Law Enforcement.

(f) A designated member of the execution team, in the presence of one or more additional members of the execution team, including an independent observer from the Florida Department of Law Enforcement, will prepare the lethal injection chemicals as follows, ensuring that each syringe used in the lethal injection process is appropriately labeled, including the name of the chemical contained therein:

(1) Sodium pentothal: A sterile, disposable twenty cubic centimeter (20cc) syringe will be used to draw ten milliliters (10ml) of sterile water for injection from a vial containing same and then inject those ten milliliters (10ml) of sterile water for injection into a vial containing 500 milligrams of sodium pentothal to create a five percent (5%) solution of sodium pentothal. This procedure will be repeated until twenty (20) vials of sodium pentothal have been reconstituted, for a total of ten grams (10g) of sodium pentothal in solution. The syringe used to reconstitute the sodium pentothal will be discarded. A new, sterile, disposable, sixty cubic centimeter (60cc) syringe and needle will be used to draw the entire contents of five vials of sodium pentothal in solution, for a total of two and one-half grams (2.5g) of sodium pentothal in solution. That syringe will then be fitted with an eighteen (18) gauge, one (1) inch, blunt cannula (tube), clearly labeled with the number one (1), and placed in the first slot on a stand designed to hold eight (8) such syringes in separate slots. The stand will be clearly labeled with the letter "A." This process will be repeated with a second syringe, which will be clearly labeled with a number two (2) and placed in the second slot on stand "A." Two additional syringes will be drawn in the same manner, fitted with the blunt cannula, and clearly labeled with the numbers one (1) and two (2), respectively. These two syringes will be placed in the first two slots on a second stand that has been clearly labeled with the letter "B." All materials used to prepare these syringes will be removed from the work area and discarded pursuant to state and federal law.

(2) Pancuronium bromide: A sterile, disposable sixty cubic centimeter (60cc) syringe will be used to draw fifty milligrams (50mg) of pancuronium bromide from one or more vials containing same. The syringe will then be fitted with an eighteen (18) gauge, one (1) inch, blunt cannula (tube). This procedure will be repeated until there are four (4) syringes, each containing fifty milligrams (50mg) of pancuronium bromide, for a total of 200 milligrams. Two syringes will be clearly labeled with the numbers four (4) and five (5), respectively, and placed into slots four (4) and five (5) on stand "A." This procedure will be repeated with the other two syringes, each of which will be fitted with a blunt cannula, labeled appropriately and placed in slots four (4) and five (5), respectively, on stand "B." All materials used to prepare these syringes will be removed from the work area and discarded pursuant to state and federal law.

(3) Potassium chloride: A sterile, disposable sixty cubic centimeter (60cc) syringe will be used to draw one hundred twenty milliequivalents (120mEq) of potassium chloride from one or more vials containing same. The syringe will then be fitted with an eighteen (18) gauge, one (1) inch blunt cannula (tube). This procedure will be repeated until there are four (4) syringes, each containing one hundred twenty milliequivalents (120mEq) of potassium chloride, for a total of 480 milliequivalents. Two syringes will be clearly labeled with the numbers seven (7) and eight (8), respectively, and placed into slots seven (7) and eight (8) on stand "A." This procedure will be repeated with the other two syringes, each of which will be fitted with a blunt cannula, labeled appropriately, and placed in slots seven (7) and eight (8), respectively, on stand "B." All materials used to

prepare these syringes will be removed from the work area and discarded pursuant to state and federal law.

(4) Saline solution: A sterile, disposable twenty cubic centimeter (20cc) syringe will be used to draw twenty milliliters (20ml) of sterile saline solution from one or more vials containing same. This procedure will be repeated until there are four (4) syringes, each containing twenty milliliters (20ml) of sterile saline solution, for a total of eighty (80) milliliters. Each syringe will then be fitted with an eighteen (18) gauge, one (1) inch, blunt cannula (tube). Two syringes will be clearly labeled with the numbers three (3) and six (6), respectively, and placed into slots three (3) and six (6) on stand "A." This procedure will be repeated with the other two syringes, each of which will be placed in slots three (3) and six (6), respectively, on stand "B." All materials used to prepare these syringes will be removed from the work area and discarded pursuant to state and federal law.

(g) The designated member of the execution team who has prepared the lethal chemicals will transport them personally, in the presence of one or more additional members of the execution team, to the executioner's room. Stand "A" will be placed on the worktop for use by the primary executioner. Stand "B" will be placed on a shelf underneath the worktop within easy reach of the executioners should they be needed during the execution. The lethal chemicals will remain secure in the locked room until the executioners arrive. No one other than the executioners will have access to the lethal chemicals, unless a stay is granted, in which case the execution team member who prepared the lethal chemicals will retrieve them from the locked room and dispose of them according to state and federal law.

(h) A designated member of the execution team will prepare, using an aseptic technique, two (2) standard intravenous (IV) infusion sets, each consisting of a pre-filled, sterile plastic bag of normal saline for IV use (a solution of sodium chloride at 0.9% concentration) with an attached drip chamber, a long sterile tube fitted with a back check valve and a clamp to regulate the flow, a connector to attach to the access device, and an extension set fitted with a luer lock tip for a blood cannula to allow for the infusion of the lethal chemicals into the line. The extension set that will be used to infuse the lethal chemicals into the primary injection line will be clearly marked with a "1," and the additional extension set that will be attached to the secondary injection line will be clearly marked with a "2."

(i) A designated member of the execution team will explain the lethal injection preparation procedure to the inmate and offer any medical assistance or care deemed appropriate. The inmate will be offered and, if accepted, will be administered an intramuscular injection of diazepam, in an appropriate dosage relative to weight, to ease anxiety.

(j) Authorized media witnesses will be picked up at the designated media on-looker area located at New River Correctional Institution by two designated Department of Corrections escort staff, transported to the main entrance of Florida State Prison as a group, cleared by security, and escorted to the population visiting park, where they will remain until being escorted to the witness room of the execution chamber by the designated escort staff.

(k) The warden will administer both a presumptive drug test (oral swab method) and a presumptive alcohol test (breath analyzer) to each member of the execution team. A positive indication for the presence of alcohol or any chemical substance that may impair their normal faculties will disqualify that person from participating in the execution process. Upon the arrival of the executioners to perform their duties, the

warden will administer both a presumptive drug test (oral swab method) and a presumptive alcohol test (breath analyzer) to each executioner. A positive indication for the presence of alcohol or any chemical substance that may impair their normal faculties will disqualify that person from participating in the execution process. If one or both of the executioners is disqualified, the warden will continue to select and test as many additional executioners as is necessary to ensure the presence of two qualified executioners at the execution.

(10) **Approximately Thirty (30) Minutes Prior to Execution:**

(a) A designated member of the execution team will establish telephone communication with the Governor's office on behalf of the warden. The phone line will remain open to the Governor's office during the entire execution procedure. The assistant warden will use this open line to report the ongoing activities of the execution team and other personnel to the Governor's office.

(b) A designated member of the execution team will escort the two executioners into the executioner's room, where they will remain until the execution process is complete.

(c) The warden will read the Warrant of Execution to the inmate.

(d) Designated members of the execution team, supervised by the designated assistant warden, will apply wrist restraints to the inmate and escort him from his cell to the execution chamber.

(e) Designated members of the execution team, supervised by the designated assistant warden, will assist the inmate, if necessary, in positioning himself/herself onto the execution gurney in the execution chamber.

(f) Designated members of the execution team, supervised by the designated assistant warden, will secure the restraining straps.

(g) One or more designated members of the execution team will attach the leads to two (2) heart monitors to the inmate's chest, ensuring that the monitors are operational both before and after the chest restraints are secured.

(h) A designated member of the execution team will insert one intravenous (IV) line into each arm at the medial aspect of the antecubital fossa of the inmate and ensure that the saline drip is flowing freely. The team member will designate one IV line as the primary line and clearly identify it with the number "1." The team member will designated the other line as the secondary line and clearly identify it with the number "2." If venous access cannot be achieved in either or both of the arms, access will be secured at other appropriate sites until peripheral venous access is achieved at two separate locations, one identified as the primary injection site and the other identified as the secondary injection site.

(i) If peripheral venous access cannot be achieved, a designated member of the execution team will perform a central venous line placement, with or without a venous cut-down (wherein a vein is exposed surgically and a cannula is inserted), at one or more sites deemed appropriate by that team member. If two sites are accessed, the extension sets attached to each line will be identified with a "1" or a "2," depending on their identification as the primary and secondary lines.

(j) One or more designated members of the execution team will remove, one at a time, from the pole attached to the gurney, the two (2) saline bags and pass the bags, along with the extension sets labeled "1" and "2," through a small opening into the executioner's room, where the primary or secondary executioner will hang the bags on separate hooks inside the room. The designated team member(s) will ensure that the tubing from the IV insertion points to the bags has not been compromised and that the saline drip is flowing freely.

(11) **Approximately Fifteen (15) Minutes Prior to Execution:**

(a) Official witnesses will be secured in the witness room of the execution chamber by two designated Department of Corrections escort staff.

(b) Authorized media witnesses will be secured in the witness room of the execution chamber.

(c) The only persons authorized in the witness room are: twelve (12) official witnesses, including family members of the victim, four (4) alternate official witnesses, one (1) nurse or medical technician, twelve (12) authorized media representatives, one (1) representative from the department's public affairs office, one (1) designated staff escort, and one (1) designated security officer. Any exception must be approved by the warden.

(d) The execution chamber will be secured. Only designated staff and other authorized persons will be allowed in the chamber.

(12) **Administration of Execution:**

(a) The warden will use the open telephone line to determine from the Governor whether there has been a stay of execution. If the warden receives a negative response, s/he will return the telephone handset to the designated assistant warden to continue reporting the ongoing activities of the execution team and other personnel to the Governor's office. The warden will then proceed with the execution.

(b) One or more designated members of the execution team will open the drape to the witness gallery window and turn on the public address (P.A.) system.

(c) The warden will permit the inmate to make an oral statement, which will be broadcast into the witness gallery over the P.A. system. At the conclusion of the inmate's statement, or if the inmate declines to make a statement, the warden will signal that the execution process has begun. A designated member of the execution team will turn off the P.A. system.

(d) In the presence of the secondary executioner and within sight of one or more members of the execution team and one of the FDLE monitors, the primary executioner will administer the lethal chemicals in the following manner:

(1) The executioner will remove from the stand on the worktop the syringe labeled number one (1), which contains two and one-half grams (2.5g) of sodium pentothal in solution, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the injection resistance of the cannula. When the

syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(2) The executioner will remove from the stand on the worktop the syringe labeled number two (2), which contains two and one-half grams (2.5g) of sodium pentothal in solution, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the injection resistance of the cannula. When the syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(3) At this point, a member of the execution team will assess whether the inmate is unconscious. The warden must determine, after consultation, that the inmate is indeed unconscious. Until the inmate is unconscious and the Warden has ordered the executioners to continue, the executioners shall not proceed to step (5).

(4) In the event that the inmate is not unconscious, the warden shall signal that the execution process is suspended and note the time and order the drapes to be closed. The execution team shall assess the viability of the secondary access site. If the secondary access site is or at any time becomes compromised, a designated member of the execution team will secure peripheral venous access at another appropriate site or will perform a central venous line placement, with or without a venous cut-down, at one or more sites deemed appropriate by that team member. Once the warden is assured that the team has secured a viable access site, the warden shall order the drapes to be opened and signal that the execution process will resume. The executioners will then be directed to initiate the administration of lethal chemicals from stand "B", starting with the syringes of sodium pentothal, labeled one (1) and two (2).

(5) The executioner will remove from the stand on the worktop the syringe labeled number three (3), which contains twenty milliliters (20ml) of saline solution, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the injection resistance of the cannula. When the syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(6) The executioner will remove from the stand on the worktop the syringe labeled number four (4), which contains fifty milligrams (50mg) of pancuronium bromide, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the injection resistance of the cannula. When the syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(7) The executioner will remove from the stand on the worktop the syringe labeled number five (5), which contains fifty milligrams (50mg) of pancuronium bromide, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the injection resistance of the cannula. When the syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(8) The executioner will remove from the stand on the worktop the syringe labeled number six (6), which contains twenty milliliters (20ml) of saline solution, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the

injection resistance of the cannula. When the syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(9) The executioner will remove from the stand on the worktop the syringe labeled number seven (7), which contains one hundred twenty milliequivalents (120mEq) of potassium chloride, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the injection resistance of the cannula. When the syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(10) The executioner will remove from the stand on the syringe labeled number eight (8), which contains one hundred twenty milliequivalents (120mEq) of potassium chloride, place the blunt cannula into the open port of the IV extension set labeled "A," and push the entire contents of that syringe into the IV port at a rate that meets the injection resistance of the cannula. When the syringe is depleted, s/he will hand the empty syringe to the secondary executioner for safe disposal.

(e) If at any time prior to or during the administration of the lethal chemicals the primary venous access becomes compromised, the warden shall stop the execution process stopped and order the drapes to be closed. The execution team shall assess the primary access site and assess the viability of the secondary access site and take appropriate remedial action at the access site, if necessary. If neither access site is viable, a designated member of the execution team will secure peripheral venous access at another appropriate site or will perform a central venous line placement, with or without a venous cut-down, at one or more sites deemed appropriate by that team member. Once the warden is assured that the execution team has secured a viable access site, the warden shall order the drapes to be opened and direct that the execution process will resume. The executioners will be directed to initiate the administration of lethal chemicals from stand "B", starting with the syringes of sodium pentothal, labeled one (1) and two (2).

(f) Throughout the execution process, one or more designated members of the execution team will observe the heart monitors. If the heart monitors reflect a flat line reading during or following the complete administration of the lethal chemicals, the physician will examine the inmate to determine whether there is complete cessation of respiration and heartbeat.

(g) Once the inmate is pronounced dead by the physician, a designated member of the execution team will record the time of death on the Lethal Injection Procedures Checklist.

(h) The warden will notify the Governor via the open phone line that the sentence has been carried out and the time of death.

(i) A designated member of the execution team will turn on the P.A. system and make the following announcement to the witnesses in the gallery: "The sentence of the State of Florida vs. [Inmate Name] has been carried out at [time of day]."

(j) The designated Department of Corrections escort staff will escort the official witnesses and all of the media pool from the witness room of the execution chamber.

(13) **Immediate Post-Execution Procedures:**

(a) Designated members of the execution team will dispose of the equipment and any remaining chemicals as required by state and federal law.

(b) The designated assistant warden will coordinate the entry of hearse attendants for recovery of the inmate's body.

(c) The inmate's body will be removed from the execution table by hearse attendants under the supervision of the designated assistant warden.

(d) The designated assistant warden will obtain a certification of death from the physician and will deliver the certification to the hearse attendants prior to their departure.

(e) The inmate's body will be transported by the hearse attendants to the medical examiner's office in Alachua County for an autopsy.

(f) The warden shall conduct a brief debriefing interview with every member of the execution, documenting any exceptional circumstances that arose during the execution. Subsequent debriefings will take place, as appropriate.

(14) **Follow-Up Procedures:**

(a) The warden will forward the Warrant of Execution and a signed statement of the execution to the Secretary of State.

(b) The warden will file an attested copy of the Warrant of Execution and a signed statement of the execution with the clerk of the court that imposed the sentence.

(c) The correctional senior sentence specialist will advise central office records by e-mail of the inmate's name and the date and time of death by execution.

James R. McDonough, Secretary

9 May 2007
Date