PHIL BREDESEN
GOVERNOR

GEORGE M. LITTLE
COMMISSIONER

STATE OF TENNESSEE
DEPARTMENT OF CORRECTION
SIXTH FLOOR, RACHEL JACKSON BUILDING
320 SIXTH AVENUE NORTH
NASHVILLE, TENNESSEE 37243-0465
Office (615) 741-1000 • FAX (615) 532-8281

April 30, 2007

The Honorable Phil Bredesen
Governor of Tennessee
First Floor, State Capitol
Nashville, TN 37243

Dear Governor Bredesen:

The Department of Correction has completed a comprehensive review of the manner in which death sentences are administered in Tennessee. A copy of our report is attached.

After a rigorous consideration of our options and consultation with the review committee, I have directed the continued use of a three-chemical lethal injection protocol. The decision was based on this type of protocol being a proven method of execution. Tennessee and twenty-nine other jurisdictions have used this general method. It has been found to be humane when properly administered. We have significantly improved the documentation and procedures to support the three-chemical protocol.

We have also reviewed our electrocution protocol. We found the existing procedures to be adequate. However, we have revised the procedures to make them more clear, concise, and complete.

We will continue with on-going reviews of our protocols and procedures. We will continue to assess best practices, and we will make appropriate revisions and/or recommend improvements, as appropriate. As of this date, we have begun training using the updated procedures. The Department is ready to carry out the laws of the State of Tennessee.

Sincerely,

George M. Little

GML:PC
Attachment

TENNESSEE
DEPARTMENT OF CORRECTION

Report on Administration of Death Sentences in Tennessee

April 2007

Prepared by
Tennessee Department of Correction

TABLE OF CONTENTS

Executive Summary 1

Introduction 3

Methodology 4

Selected Areas of Inquiry – Lethal Injection 6

A. Lethal Injection Chemical Selection 6

B. Lethal Injection Chemical Procurement and Storage 8

C. IV Team Qualifications and Training 8

D. Use of Cut-Down Procedure 8

E. Executioner Qualifications and Training 8

F. Chemical Administration Documentation 9

Selected Areas of Inquiry – Electrocution 9

A. History of Tennessee's Electric Chair 9

B. Electrocution Equipment Control Settings..... 9

C. Electrocution Equipment Maintenance and Testing 9

Appendix 10

A. Executive Order No. 43

B. Florida Governor's Commission on Administration of Lethal Injection

C. Transcript of April 5, 2007 Public Hearing

Executive Summary

In response to Executive Order No. 43, Commissioner George M. Little appointed a committee to review the administration of death sentences in Tennessee and revise the Department's Execution Protocols and Manual. The Committee utilized a number of resources including, but not limited to, the following:

- The Office of the Attorney General and Reporter
- Participants in past Tennessee executions, including Riverbend Maximum Security Institution Warden Ricky Bell, members of the IV team, and a physician
- Corrections professionals and legal experts from other jurisdictions
- Anesthesiologists
- An Electrical Engineer
- The Final Report of Florida's Governor's Commission on Administration of Lethal Injection
- Court opinions in execution protocol cases from Tennessee and other jurisdictions.

The Department also held a public hearing on April 5, 2007 for the purpose of receiving input from persons with relevant expertise on the issue of how to best ensure that the Department's execution protocol provides constitutional and appropriate executions. Two attorneys made presentations at the hearing, and comments were also taken from other attendees.

Based upon its research and the input it received from various sources, the Department developed updated execution manuals for lethal injection and electrocution that incorporate best practices from the Department's own experience and that of other jurisdictions. Highlights include:

- Detailed descriptions of each step of the electrocution and lethal injection processes
- Detailed descriptions of the qualifications, selection processes, and training requirements for execution team members
- A detailed description of the services provided to family members of the condemned inmate's victims
- Enhanced requirements for contemporaneous documentation of each significant stage of an execution as it is carried out
- Enhanced accountability in connection with the procurement, storage, and disposition of the lethal injection chemicals.

The protocol for lethal injections employs the following chemicals in the sequence shown:

- 5 Grams of Sodium Thiopental in 200 cc of sterile water
- 100 Mg of Pancuronium Bromide (1 Mg/ml)
- 100 mL of 2 mEq/mL Potassium Chloride, for a total of 200 mEq.

After the infusion of each chemical, the IV line is flushed with 50 cc saline solution.

At least 29 other jurisdictions, including the Federal Bureau of Prisons, have lethal injection protocols consisting of sodium thiopental, pancuronium bromide, and potassium chloride in varying amounts. Sodium thiopental is a barbiturate that rapidly induces general anesthesia. Pancuronium bromide is a neuromuscular blocking agent that induces paralysis and causes breathing to cease. Potassium chloride is a salt that interferes with the electrical signaling essential to normal heart function. In the amounts listed above, each of the chemicals, independently, is lethal.

Tennessee has chosen to use 5 grams of sodium thiopental, the largest amount used by other jurisdictions, to provide enhanced assurance that the condemned inmate will be unconscious when the remaining chemicals are infused.

The revised lethal injection and electrocution manuals and protocols will provide further assurance that death sentences are administered in a constitutional and appropriate manner in Tennessee.

Introduction

On February 1, 2007, Governor Phil Bredesen issued Executive Order No. 43 directing the Department of Correction to complete a comprehensive review of the manner in which the death penalty is administered in Tennessee. The Executive Order provided as follows:

1. I hereby direct the Commissioner of Correction ("Commissioner") to initiate immediately a comprehensive review of the manner in which death sentences are administered in Tennessee. This review shall specifically include the state's protocols and any related procedures, whether written or otherwise, related to the administration of death sentences, both by lethal injection and by electrocution. In completing this review, the Commissioner is directed to utilize all relevant and appropriate resources, including but not limited to scientific and medical experts, legal experts, and Correction professionals both from within and outside of Tennessee. As a component of this review, the Commissioner is further directed to research and perform an analysis of best practices used by other states in administering the death penalty.

2. As soon as practical, but no later than May 2, 2007, the Commissioner of Correction is directed to establish and provide to me the new protocols and related written procedures for administering death sentences in Tennessee, both by lethal injection and electrocution. In addition, the Commissioner is directed to provide me with a report outlining the results of the review completed pursuant to paragraph one (1) above.

In response to Executive Order No. 43, Commissioner Little appointed a Committee to undertake the required review and prepare recommended protocols for the administration of the death penalty in Tennessee. After extensive research and after receiving input from experts in relevant fields, the Committee developed new execution manuals incorporating written procedures based on Tennessee's own experience and that of other jurisdictions, as well as input from medical experts.

This report describes the Department's methodology in developing the new manuals and the input it received from various sources, and summarizes the most significant issues addressed in the manuals.

Methodology

In response to Executive Order No. 43, Commissioner George M. Little appointed a Committee to undertake the required review of the manual of procedures for electrocution and lethal injection in Tennessee. The Committee consisted of Deputy Commissioner Gayle Ray, Assistant Commissioner of Operations Roland Colson, Riverbend Maximum Security Institution Warden Ricky Bell, Executive Assistant to the Commissioner Julian Davis, and General Counsel Debra K. Inglis.

Initially, the Department received guidance from the State Attorney General's Office concerning the legal challenges to execution protocols in Tennessee and other jurisdictions and possible areas of inquiry for the Committee. The Committee reviewed the opinion issued by the Tennessee Supreme Court in *Abdur'Rahman v. Bredesen*, 181 S.W.3d 292 (Tenn. 2005), *cert. denied*, 126 S.Ct. 2288 (2006),as well as the opinions filed by the Chancery Court for Davidson County and the Tennessee Court of Appeals in the same proceeding. It reviewed the complaint filed in *Harbison v. Little*, No. 3:06-1206 (M.D. Tenn.) concerning Tennessee's previous protocol. It also reviewed court opinions and other documents filed in cases challenging execution protocols from other jurisdictions.

The Department identified several areas warranting particular focus in the review process. As to lethal injection, these areas included the selection and amounts of the chemicals to be used, requirements pertaining to the procurement and storage of the lethal injection chemicals, the qualifications and training required of the members of the IV team and the executioner, the method to be used for obtaining venous access when the IV team cannot establish peripheral venous access, and documentation requirements pertaining to the administration of the lethal chemicals. As to electrocution, the committee considered whether any modifications should be made to the settings on the electric chair control panel, as well as the requirements for regular testing and maintenance of the equipment.

The Committee reviewed the Department's previous protocol and execution manual. Ricky Bell, Warden of the Riverbend Maximum Security Institution, answered questions from other Committee members about the process used in the state's two recent lethal injection executions as well as questions about the electrocution process. The Committee also met with other participants in Tennessee's two lethal injection executions about specific areas.

The Committee consulted a number of other jurisdictions for information on their protocols, the development of their protocols, and their experiences in implementing those protocols. While some jurisdictions were unwilling to share information due to legal requirements for maintaining confidentiality, the Committee was able to obtain information from several jurisdictions. Particularly

helpful was information obtained by the Committee during two on-site meetings with Virginia Department of Corrections staff in Greensville, Virginia and with Federal Bureau of Prisons staff at U.S.P. Terre Haute.

At the Greensville Correctional Facility, the Deputy Warden, other institutional staff, and representatives of the Virginia Attorney General's Office answered questions about all aspects of Virginia's lethal injection process and provided a tour of the capital punishment area.

At U.S.P. Terre Haute, the Federal Bureau of Prisons' execution team gave a comprehensive presentation to the Committee and representatives of several other jurisdictions. The presentation included a discussion of lessons learned when carrying out lethal injection executions in several high profile cases. The federal execution team demonstrated its procedure while conducting training exercises.

The Committee consulted with two anesthesiologists concerning lethal injection and an electrical engineer concerning electrocution. The Committee also consulted with the physician who is present at Tennessee's executions to pronounce death and to perform a cut-down procedure, if necessary.

The Committee reviewed the Final Report with Findings and Recommendations issued by Florida's Governor's Commission on Administration of Lethal Injection on March 1, 2007.

The Department also held a public hearing on April 5, 2007. Representatives of the Tennessee Medical Association, Tennessee Bar Association, University of Tennessee College of Medicine, Southeastern Pharmacology Society, the Federal Public Defender for the Middle District of Tennessee, the Federal Defender Services of Eastern Tennessee, Inc., and specific members of the defense bar were invited to provide input on how to best ensure that the Department's execution protocol provides constitutional and appropriate executions. Two attorneys made presentations at the hearing, and comments were also taken from other attendees. A transcript of the hearing is attached.

The Committee met on the following dates:

February 6, 2007	March 5, 2007	April 2, 2007
February 15, 2007	March 8, 2007	April 5, 2007
February 20, 2007	March 14, 2007	April 10, 2007
February 22, 2007	March 16, 2007	April 12, 2007
	March 19, 2007	April 16-17, 2007
	March 23, 2007	April 19, 2007
	March 28, 2007	April 25, 2007
	March 30, 2007	

Selected Areas of Inquiry – Lethal Injection

The following issues relating to lethal injection were among those given particular attention in researching best practices:

A. Lethal Injection Chemical Selection

The most significant issue the Department addressed was the selection of the chemicals and dosage to be used in lethal injection executions in Tennessee. After considerable research and consultation with medical experts, the Department has retained a three-chemical protocol.

The following is a summary of the three best alternatives considered by the Department, and its findings regarding the advantages and disadvantages of each.

1. Three Chemical Protocol (5 Grams of Sodium Thiopental, 100 Mg of Pancuronium Bromide, and 200 mEq. of Potassium Chloride)

At least 30 jurisdictions, including the Federal Bureau of Prisons and Tennessee under its previous protocol, have a three-chemical lethal injection protocol consisting of sodium thiopental, pancuronium bromide, and potassium chloride in varying amounts. Sodium thiopental is a barbiturate that rapidly induces general anesthesia. Five grams of sodium thiopental given intravenously is, by itself, lethal. Pancuronium bromide is a neuromuscular blocking agent that induces paralysis and causes breathing to cease. An intravenous injection of 100 Mg of Pancuronium Bromide is also lethal. Potassium chloride is a salt that interferes with the electrical signaling essential to normal heart function. A 200 mEq dose administered intravenously causes cardiac arrest and rapid death.

The issues raised on behalf of death row inmates have generally focused on the potential for error in the administration of the three-chemical protocol. It is generally agreed that if administered correctly and without error the protocol would result in a relatively painless death. In an 8th Amendment challenge to the three-chemical protocol brought by a Tennessee inmate under sentence of death, the Tennessee Court of Appeals summarized the inmate's position as follows:

> The evidence is essentially uncontradicted that the injection of either Pavulon [pancuronium bromide] or potassium chloride, by themselves, in the dosages required by Tennessee's three-drug protocol would cause excruciating pain. Without sedation, the injection of potassium chloride would, in the words of the anesthesiologist testifying on Mr. Abdur'Rahman's behalf, "deliver the maximum amount of pain the veins

> can deliver." Similarly, persons receiving a massive dose of Pavulon without sedation would be conscious while they asphyxiated. Thus, the ultimate determination regarding whether Tennessee's three-drug protocol causes unnecessary physical pain or psychological suffering depends on the efficacy of the injection of Sodium Pentothal [sodium thiopental] that precedes the injections of Pavulon and potassium chloride.

Abdur'Rahman v. Bredesen, 2004 WL 2246227, *16 (Tenn. App. 2004), *aff'd, Abdur'Rahman v. Bredesen*, 181 S.W.3d 292 (Tenn. 2005). After reviewing the expert testimony presented in that case as well as the conclusions reached by courts in other jurisdictions, the Court concluded:

> In light of the evidence that the Sodium Pentothal is administered before the Pavulon and the potassium chloride, and that it remains effective until death occurs, we agree with the trial court's conclusion that Mr. Abdur'Rahman failed to prove that the injection of chemicals in accordance with Tennessee's three-drug protocol would cause unnecessary physical pain or psychological suffering.

Id. at 16.

Consistent with the findings of the Court in Abdur'Rahman, the experts consulted by the Committee all agreed that the intravenous administration of 5 grams of sodium thiopental in a person would be lethal, that it would render the person unconscious within a few seconds, and that its anesthetic effect would continue until death. Accordingly, the Department found that the three chemical protocol, when administered appropriately, will result in a humane death.

Several factors weigh in favor of retaining the three-chemical protocol. Tennessee's experience in implementing the protocol has been positive. Tennessee's protocol has been upheld by all courts that have ruled upon its constitutionality. In addition, the three-chemical protocol has been used in almost all of the lethal injection executions that have taken place in this country, allowing Tennessee to draw upon the considerable experience of other jurisdictions in implementing the protocol.

Pancuronium bromide is included in the protocol because it speeds the death process, prevents involuntary muscular movement that may interfere with the proper functioning of the IV equipment, and contributes to the dignity of the death process.

The Department also took into consideration several factors that weighed against retaining the three-chemical protocol. The procedure is the most complicated of the three protocols, and there is a remote chance of an error in implementation that may cause the inmate to incur brief pain. Finally, the three-chemical

protocol presents the greatest difficulty in accounting for the lethal injection chemicals, particularly because pancuronium bromide requires refrigeration.

2. Two-Chemical Protocol (Sodium Thiopental and Potassium Chloride)

The Department considered a two-chemical protocol consisting of sodium thiopental and potassium chloride. This protocol has an advantage over the three-chemical protocol in that it eliminates the use of pancuronium bromide. As a result, it would address the allegation that, although appearing unconscious, a condemned inmate might in fact be conscious and experience pain from the administration of potassium chloride. It would also likely result in a somewhat faster death than a one-chemical protocol. On the other hand, the administration of potassium chloride without a preceding dose of pancuronium bromide would typically result in involuntary movement which might be misinterpreted as a seizure or an indication of consciousness. This two-chemical protocol has also not been used by any other jurisdiction to carry out an execution.

3. One-Chemical Protocol (Sodium Thiopental)

Finally, the Department considered the merits of a one-chemical protocol consisting of 5 grams of sodium thiopental.

The primary advantage of the one-chemical protocol is that it is much simpler to administer and provides an even lower risk of error in its administration. As compared to the two- and three- chemical protocols, it has the advantage of eliminating both of the chemicals which, if injected into a conscious person, would cause pain. It is similar to the process used in animal euthanasia. Using one chemical that does not require refrigeration greatly simplifies the process of maintaining and accounting for the lethal injection chemicals.

The one-chemical protocol has several disadvantages. First, the two- and three-chemical protocols would likely result in a more rapid death. Second, the effect and required dosage of sodium thiopental would be less predictable and more variable when it is used as the sole mechanism for producing death than it would when used in combination with pancuronium bromide and potassium chloride. Third, to date no other state has used a similar protocol, and thus in the context of lethal injection executions there is no experience upon which Tennessee can draw.

B. Lethal Injection Chemical Procurement and Storage

The Department's previous protocol provided assurance that the lethal injection chemicals would be procured and stored in such a way as to further minimize the

possibility of contamination, dilution, or adulteration or loss of the chemicals. An examination of best practices from other jurisdictions, however, suggests that accountability would be enhanced through improved documentation of these processes. Accordingly, the protocol includes enhanced documentation requirements with regard to the procurement and storage of lethal injection chemicals.

C. IV Team Qualifications and Training

A review of best practices from other jurisdictions reveals that persons responsible for establishing IV access should have quality training in IV therapy, and preferably possess certification or licensure in a health-related field that includes establishing IV access within its scope of practice. Although Tennessee has always used Emergency Medical Technicians with IV certification or certified paramedics to establish IV access, the previous Execution Manual did not include such a requirement. The updated manual expressly requires that persons responsible for establishing IV access have such training and certification.

Best practices in other jurisdictions require that, in addition to the continuing education required to maintain their certification and licensure, IV team members should also regularly practice establishing IV access during execution training exercises. This practice has always been in place in Tennessee, but not in writing. The updated manual expressly requires it.

D. Use of Cut-Down Procedure

The Department also considered the use of a cut-down procedure and various alternative procedures with several experts. The Department determined that cut-down procedures are not particularly difficult for physicians to perform, especially for those who have prior experience performing the procedure. Accordingly, it has been retained as an option if needed to gain IV access.

E. Executioner Qualifications and Training

Although not all jurisdictions require the executioner to have training in IV therapy, such training prepares the executioner to recognize when IV access is not adequately established, allowing him to take appropriate corrective action. The long-standing but unwritten practice in Tennessee has always been to use an executioner trained in IV therapy. The Department considers this to be an important requirement and has expressly incorporated it into the protocol.

F. Chemical Administration Documentation

An examination of best practices from other jurisdictions suggested that post-execution review of lethal injection executions is facilitated by contemporaneous documentation of the administration of the lethal injection chemicals. An express requirement for contemporaneous documentation by a member of the IV team has been incorporated into the updated manual.

Selected Areas of Inquiry – Electrocution

The following issues relating to electrocution were among those given particular attention in researching best practices:

A. History of Tennessee's Electric Chair

In 1989, Tennessee's electric chair was refurbished and a new electrocution system was installed by Fred A. Leuchter Associates, Inc. Later the system underwent substantial modifications at the recommendation of Dr. Michael Morse, PhD, and Jay Wiechert, a professional electrical engineer who has consulted with a number of states on electrocution protocols. Through subsequent years Mr. Weichert has consulted with the Tennessee Department of Correction concerning the operation of its electrocution system and has tested and maintained the system in working order.

The Committee met with Mr. Weichert at Riverbend Maximum Security Institution on March 5, 2007. He explained in detail how the system operates, the recommended settings, and how to respond to various contingencies. His recommendations have been incorporated into the electrocution manual.

B. Electrocution Equipment Control Settings

Expert input received by the Department indicates that the electrocution equipment should be set to render 1750 volts at 7 amps, cycled on for 20 seconds, off for 20 seconds, and on for an additional 15 seconds. These settings have been retained.

C. Electrocution Equipment Maintenance and Testing

Although not required by the state's previous written protocol, the Department has tested its electrocution system at least quarterly and has conducted regular maintenance as required. The Department considers this schedule to be adequate and has expressly incorporated it into the updated manual. The updated manual also expressly requires documentation of testing, maintenance, and modifications in a permanent ledger.

Selected References

Hamilton v. Jones, 472 F.3d 814 (10th Cir. 2007)

Taylor v. Crawford, 457 F.3d 902 (8th Cir. 2006)

Brown v. Beck, 445 F.3d 752 (4th Cir. 2006), *pet. for cert filed*, (April 20, 2006) (No. 05-10482)

Morales v. Hickman, 438 F.3d 926 (9th Cir. 2006), *cert. denied*, 126 S.Ct. 1314, 163 L.Ed.2d 1148 (2006)

Morales v. Tilton, 465 F.Supp.2d 972 (N.D.Cal. 2006)

Evans v. Saar, 412 F.Supp.2d 519 (D. Md. 2006)

Reid v. Johnson, 333 F.Supp.2d 543 (E.D.Va. 2004)

Blaze v. Rees, ____ S.W.3d ____, 2006 WL 3386544 (Ky. 2006)

Abdur'Rahman v. Bredesen, 181 S.W.3d 292 (Tenn. 2005), *cert. denied*, 126 S.Ct. 2286, 164 L.Ed.2d 813 (2006)

Coe v. Sundquist, No. M2000-00897-SC-R9-CV (Tenn.) (April 19, 2000)

State v. Webb, 252 Conn. 128, 750 A.2d 448 (2000)

Substantive Challenges to Propriety of Execution by Lethal Injection in State Capital Proceedings, 21 A.L.R. 6th 1 (2007)

Denno, Deborah, *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 (2002)

Appendix

A. Executive Order No. 43

B. Florida Governor's Commission on Administration of Lethal Injection

C. Transcript of April 5, 2007 Public Hearing