IN THE SUPREME COURT OF TENNESSEE
AT NASHVILLE

APR 15 2005

ABU-ALI ABDUR'RAHMAN, Appellant, v. PHIL BREDESEN (formerly Don Sundquist), Governor of the State of Tennessee, QUENTON WHITE (formerly Donald Campbell), Commissioner, Tenn. Dep't. of Correction, RICKY BELL, Warden of Riverbend Maximum Security Institution, VIRGINIA LEWIS, Warden of Special Needs Facility, and TENNESSEE DEPARTMENT OF CORRECTION, Appellees.	Case No. M2003-01767-SC-R11-CV (Court of Appeals of Tennessee, No. M2003-10767-COA-R3-CV) (Chancery Court for Davidson County, No. 02-2236-III) CAPITAL CASE ORAL ARGUMENT REQUESTED

BRIEF OF *AMICI CURIAE* AMERICAN CIVIL LIBERTIES UNION OF TENNESSEE AND SIDELINES NEWSPAPER

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Amici seek permission to file this brief on the narrow argument that Tennessee's use of Pavulon in its lethal injection protocol violates the First Amendment right of access guaranteed to the public and the press. *Amicus* ACLU is a public interest organization, which seeks to file this brief as a representative of the public. *Amicus* Sidelines Newspaper is a student newspaper at Middle Tennessee State University, which seeks to file this brief as a representative of the press. Neither Appellant nor Appellee is in a position to address the violations of the First Amendment rights of the public and the press that arise from the use of Pavulon because neither has standing to represent the public or the press. *Amici* submit this brief as assistance to the Court in addressing the important First Amendment issues present in this case.

As *amici's* brief sets forth, the public and press (as the public's surrogate) are guaranteed a right of access under the First Amendment of the United States Constitution, and under Article 1, Sections 19 and 23, of the Tennessee Constitution. The express language of the Freedom of Speech and Press Clause of Tennessee's Constitution is especially strong in recognizing this right of access. It expressly states, "That the printing press shall be free to every person to examine the proceedings of the Legislature; or of any branch or officer of the government . . . ." Tenn. Const. I, § 19. The purpose of the First Amendment[1] is to ensure that the public is sufficiently informed so that it may meaningfully participate in the democracy enjoyed in this country and this state. Without full access to executions, the public is deprived of sufficient information to participate in the public debate of whether execution by lethal injection

[1] For the sake of brevity, hereafter, *amici* shall refer only to the "First Amendment," which is meant to encompass the public's and press' right of access guaranteed under both the Tennessee and the United States Constitutions.

comports with "evolving standards of decency which mark the progress of a maturing society." See Trop v. Dulles, 356 U.S. 86, 101 (1958) (quoted by Koch, J., in the App. Op.[2] at 19).

Specifically, *amici* maintain that Tennessee's use of Pavulon, the second of three chemicals injected into the condemned pursuant to Tennessee's lethal injection protocol, which acts as a "chemical veil" by paralyzing the condemned, violates the First Amendment by completely masking from the public and the press any pain that the condemned may suffer. Pavulon prevents the public from ever detecting that the condemned may be in pain. *Amici* submit that were the public to detect that the condemned was suffering during execution, such factor would be relevant to the public debate surrounding the death penalty, generally, and the use of lethal injection and of Pavulon, specifically.

[2] *Amici* shall refer to the opinion from the Court of Appeals as "App. Op." and to the opinion from the Chancery Court as "Ch. Op."

STATEMENT OF THE CASE

The facts of this case have been well briefed by both Appellant and Appellee. For the benefit of the Court, *amici* focus on only those facts relevant to *amici's* First Amendment arguments.

The opinions from both the Chancery Court and the Court of Appeals set out the details of Tennessee's lethal injection protocol. As both opinions explain, the executioner injects three chemicals into the veins of the condemned. The first chemical is sodium thiopental, also known as Pentothal, which serves as a brief anesthesia. The second chemical is pancuronium bromide, also known as Pavulon, which stops the lungs and paralyzes the body. And the third chemical is potassium chloride, which stops the heart. (Ch. Op. at 3; App. Op. at 6.)

Pavulon acts as a "chemical veil." It is undisputed that Pavulon paralyzes the condemned's body, making it impossible to thereafter communicate or move. See (App. Op. at 6, n.23.) As the Court of Appeals noted:

> All the experts who testified in this case agreed that Pavulon paralyzes a person's skeletal muscles and that it affects a person's ability to move, but not to think or experience pain. The paralysis could prevent a person who has not been adequately sedated from signaling or communicating that he or she is in extreme discomfort. The expert testimony was graphically reinforced by the testimony of a patient who described going through an entire surgical procedure without being fully sedated and without the ability to communicate the pain she was experiencing. *There is no dispute that Pavulon can mask the pain and suffering of persons who are not completely sedated and that these persons would appear to be peaceful despite the pain they were experiencing.*

Id. at 23 (emphasis added). The Chancery Court noted in its opinion: "The chemical veil [of Pavulon] taps into every citizen's fear that the government manipulates the setting and gilds the lily, whether it be with reporting on the economy or election results, to orchestrate and

manipulate public reaction." (Ch. Op. at 13.) Although the Chancery Court concluded that the use of Pavulon does not violate the Eighth Amendment prohibition of cruel and unusual punishment, it explicitly concluded that the use of Pavulon constitutes "gilding of the lily." Id.

It is undisputed that the use of Pavulon is not "error free," and that the condemned would feel incredible pain without sufficient anesthesia. (Ch. Op. at 2, 14.) Even if remote, the risks of error nevertheless exist. Trial testimony indicated that Tennessee has encountered problems with kinked tubes, knots and blowouts during practice runs. (Tr. transcript at 234, 236-37, 307-08.) Trial testimony also indicated that 15 lethal injections in the United States have been "botched" between 1985 and 1997, meaning that the executioners encountered unanticipated problems or delays that caused or could have caused extreme pain for the condemned. (Tr. transcript at 262; Tr. Ex. 14.) As the Chancery Court explained:

> [Potassium] chloride [the third drug, which stops the heart] is extremely painful. Pavulon . . . is psychologically horrific. There is no doubt, as established by the testimony of . . . the patient who underwent an unsuccessful anesthesia administration, that failure of the anesthetic to block consciousness and allow the patient to experience the Pavulon is torturous.

(Ch. Op. at 14.) After conducting substantial research into executions by lethal injection, the leading British medical journal concluded: "Our data suggest that anesthesia 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." Leonidas G. Koniaris et al., Inadequate Anesthesia in Lethal Injection for Execution, 365 The Lancet 1412, 1414 (2005).

Tennessee's standards of decency regarding the death penalty have continued to change and mature over the years. Historically, the first executions in Tennessee were by hanging.

(App. Op. at 15, n.56.) By 1913, Tennessee's standards of decency had evolved so that electrocution was the chosen method of death for condemned prisoners. See Id. Marking yet further evolving societal standards, in 1998 the Tennessee General Assembly authorized execution by lethal injection. See Id. at 5.

ARGUMENT

It is well established that the First Amendment guarantees the public and the press[3] a qualified right of access to governmental proceedings. See Press-Enter. Co. v. Superior Court, 478 U.S. 1, 8-14 (1986) (regarding preliminary hearings) ("Press-Enter. II"); Press-Enter. Co. v. Superior Court, 464 U.S. 501, 510-11 (1984) (regarding voir dire); Globe Newspaper Co. v. Superior Court, 457 U.S. 596, 603-11 (1982) (regarding testimony of child victim of sex offense); Richmond Newspapers, Inc. v. Virginia, 448 U.S. 555, 579-80 (1980) (regarding criminal trials). As the United States Supreme Court has explained, this right of access is grounded in "the common understanding that a major purpose of [the First] Amendment was to protect the free discussion of governmental affairs." Globe Newspaper, 457 U.S. at 604. The First Amendment right of access guarantees that "the individual citizen can effectively participate in and contribute to our republic system of self-government," and ensures "that this constitutionally protected discussion of governmental affairs is an informed one." Id. at 604-05.

In the context of a prison, the right of access is qualified, but still present. The United States Supreme Court has recognized that "the conditions in this Nation's prisons are a matter that is both newsworthy and of great public importance." Pell v. Procunier, 417 U.S. 817, 831 n. 7 (1974). Further, "members of the press are accorded substantial access to federal prisons in order to observe and report the conditions they find there." Saxbe v. Washington Post Co., 417 U.S. 843, 847 (1974).

Recently, when confronted with the issue of access to executions, the Ninth Circuit held that "the public enjoys a First Amendment right to view executions from the moment the

[3] The press' right of access to governmental proceedings is coextensive with the public's right of access. See Houchins v. KQED, Inc., 438 U.S. 1, 15-16 (1978) (holding that "the media have no special right of access . . . different from or greater than that accorded to the public generally").

condemned is escorted into the execution chamber, including those initial procedures that are inextricably intertwined with the process of putting the condemned inmate to death." California First Amendment Coalition v. Woodford, 299 F.3d 868, 877 (9th Cir. 2002) (quotations omitted) ("CFAC"). The court ruled in favor of the public and press, who challenged the lethal injection protocol, which, by use of a curtain – a *literal veil* -- prohibited access by witnesses to the condemned as he was escorted into the chamber, strapped to the gurney and injected with the lethal chemicals. Id. at 871, 876. In reaching this holding, the Ninth Circuit looked both to the historical tradition of public access to executions and to the functional importance of public access to executions. Id. at 875-77 (citing Press-Enter. II, 478 U.S. at 8-9); see also Mayher v. Wilder, 46 S.W.2d 760, 777 (Tenn. Ct. App. 2001) (holding no right to access in Tennessee for legislative meetings exists, but recognizing these same two prongs – historical tradition and functional importance – in addressing claims of public access to specific governmental proceeding).

Historically, executions were open to all who wished to be present. CFAC, 229 F.3d at 875. This country's executions follow the lead of those in England, which from 1196 to 1783 hosted up to 50,000 public executions in a single city. Id. Although executions in the United States eventually moved from the public square to inside prison walls, "states implemented procedures that ensured executions would remain open to some public scrutiny." Id. Tennessee's capital punishment statute explicitly authorizes seven members of the press to serve as witnesses of the execution, Tennessee Code Annotated Section 40-23-116(6), presumably as surrogates of the public. See Richmond Newspapers, 448 U.S. at 573 (noting that the press serves "as surrogates of the public" and that the modern public gathers its information about trials through the media, rather than by first-hand observation or word of mouth"). Thus, the

CFAC Court concluded that historical tradition strongly supported the public's First Amendment right of access to the entire lethal injection execution process, and that denial of this access through use of the curtain was a constitutional violation. CFAC, 299 F.3d at 876.

Having access to the entire execution process is important for the public to educate itself. Id.

> An informed public debate is critical in determining whether execution by lethal injection comports with the "evolving standards of decency which mark the progress of a maturing society." To determine whether lethal injection executions are fairly and humanely administered, or whether they ever can be, citizens must have reliable information about the "initial procedures," which are invasive, possibly painful and may give rise to serious complications.

Id. (quoting Trop v. Dulles, 356 U.S. 86, 101 (1958), and citing Globe Newspaper, 457 U.S. at 606). The United States Supreme Court has recognized the importance of allowing the public to view the government's implementation of punishment. See Richmond Newspapers, 448 U.S. at 571 ("The crucial prophylactic aspects of the administration of justice cannot function in the dark; no community catharsis can occur if justice is done in a corner or in any covert manner."). Thus, the Ninth Circuit concluded that use of a curtain in executions violated the First Amendment by impeding the public's right to gather information about government proceedings. CFAC, 229 F.3d at 877.

In the present case, Tennessee's use of Pavulon functions as the chemical equivalent to the curtain in CFAC. Both the literal and chemical veil disguise critical elements of death by lethal injection. Pavulon's chemical veil, however, is even more disturbing because, as noted in the Chancery Court opinion, "the subject gives all the appearances of a serene expiration when actually the subject is feeling and perceiving the excruciating painful ordeal of death by lethal

injection." (Ch. Op. at 12.) "The Pavulon gives a false impression of serenity to viewers, making punishment by death more palatable and acceptable to society." Id.

Amici's First Amendment arguments rests against the backdrop of the Eighth Amendment prohibition on cruel and unusual punishment. In the present case, the Court of Appeals explained that, "whether the mode of punishment conforms with contemporary norms and standards of decency is arguably the most critical" of four factors in deciding whether specific punishment is cruel and unusual. (App. Op. at 18, quoting Van Tran v. State, 66 S.W.3d 790, 801 (Tenn. 2001)). For the public and press to participate in the debate of whether to allow executions, and the debate over which method of execution to use, they must have full access to executions. The use of Pavulon denies such access and therefore makes such debate impossible.

Courts addressing Eighth Amendment arguments of cruel and unusual punishment have explained their understanding that society's standards of decency evolve with time. As the Court of Appeals noted, "historical acceptance of a particular mode of punishment is not necessarily dispositive," (App. Op. at 18, quoting Gregg. v. Georgia, 428 U.S. 153, 174 n.19 (1976); State v. Black, 815 S.W.2d 166, 188 (Tenn. 1991)), and the "prohibition against cruel and unusual punishment is not limited to the practices condemned at the end of the Eighteenth Century. Id. (citations omitted). The use of Pavulon in Tennessee's lethal injection protocol hinders the evolution of standards of decency.

Our democracy depends on an informed electorate so that the officials it elects, in turn, will enact laws reflecting the will of the citizenry. In relying on the fact that multiple states had enacted similar laws that either allow or require execution by lethal injection, some of which utilize Pavulon, both the Chancery Court and the Court of Appeals concluded that Tennessee's

lethal injection protocol is not cruel or unusual.[4] (See App. Op. at 21; Ch. Op. at 8, 9, 17.) As the Court of Appeals explained, in "[a]scertaining contemporary community standards . . . the most common sort of objective evidence relied upon by the courts are the statutes passed by society's elected representatives," (App. Op. at 19, citing Gregg, 428 U.S. at 173, and Penry v. Lynaugh, 492 U.S. 302, 334 (1989), overruled on other grounds, Atkins v. Virginia, 536 U.S. 304 (2002).) As long as courts examine present laws as part of the litmus test for standards of decency,[5] it is critical that the public be given access to the entire execution process. As long as executioners are allowed to use Pavulon in Tennessee, that access will be obstructed and the public's debate over executions will be ill-informed. If the public cannot witness the full effect of lethal injection on the condemned, society's debate over executions cannot evolve.

Although the Court of Appeals was not faced with a First Amendment challenge in the proceedings below, reliance on its Eighth Amendment analysis by this Court in addressing *amici's* challenge would be misguided. The Court of Appeals explained that, because the executioner injects the condemned with anesthesia before injecting him with Pavulon, Mr. Abdur'Rahman failed to prove that Tennessee's lethal injection protocol violates the Eighth Amendment's prohibition against cruel or unusual punishment. (App. Op. at 22.) *Amici* take no position with regard to whether such rationale can withstand scrutiny under an Eighth Amendment analysis. But from the perspective of the First Amendment right of access, such rationale completely misses the mark. Even if the government's lethal injection protocol has been written arguably with the intention of shielding the condemned from undue pain, the public

[4] *Amici* submit that the fact that Tennessee's General Assembly enacted legislation that prohibits use of Pavulon on animals in 2001 -- *after* it enacted execution by lethal injection in 1998, as amended in 2000 -- indicates that public opinion on the use of Pavulon in Tennessee is evolving.

[5] "[L]egislative judgments alone cannot be determinative of Eighth Amendment standards since that Amendment was intended to safeguard individuals from the abuse of legislative power." Gregg, 428 U.S. at 174, n.19

has the constitutional right to examine what transpires in the unforeseen event that a mistake occurs. "[T]he use of Pavulon requires that the [condemned] be sufficiently anesthetized prior to the injection of the Pavulon to assure unconsciousness." (Ch. Op. at 12.) As one witness at trial testified, when anesthesia failed to work properly during her eye surgery, Pavulon prevented her from communicating that she was in tremendous pain. (App. Op. at 23; Ch. Op. at 5.) At least 15 other lethal injections in the United States have been "botched." (Tr. transcript at 262; Tr. Ex. 14.) Because a risk of intolerable pain exists, it is critical for the public and the press to have access so they may gather sufficient information regarding the government's actions, allowing the public to participate fully in its government. The effect of Pavulon, however, is to deny and obstruct the public's right to access, in violation of the First Amendment.

CONCLUSION

Amici submit that viewing the entire lethal injection process is critical to the public and press receiving sufficient information about executions in Tennessee. Pavulon interferes with and destroys the public's ability to fully view how Tennessee's use of lethal injection affects the condemned. Regardless of how the Court disposes of Appellant's Eighth Amendment challenge, the Court should declare that the use of Pavulon in Tennessee's lethal injection protocol violates the public's and press' First Amendment rights.

Respectfully submitted,

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APPENDIX

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.[5] 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.[6]

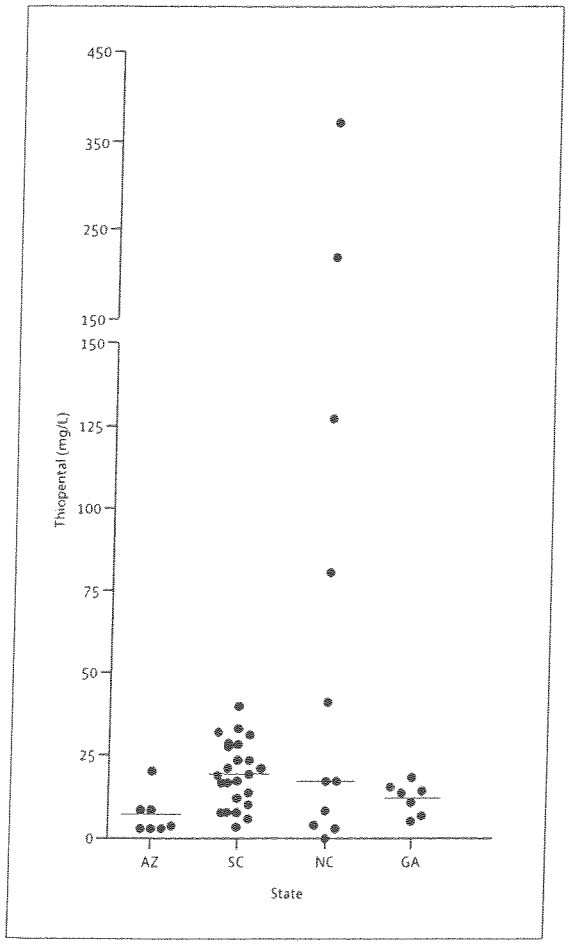

Figure 1: **Individual post-mortem thiopental concentrations in blood by state**
Lines show medians. Note different scales. GA sampled several sites in five individuals; the highest values are shown. GA values were reported as plus or minus 25%. AZ and SC did not report site of blood sampling. NC results were each from a single site, including subclavian artery, jugular vein, femoral vein, or vena cava.

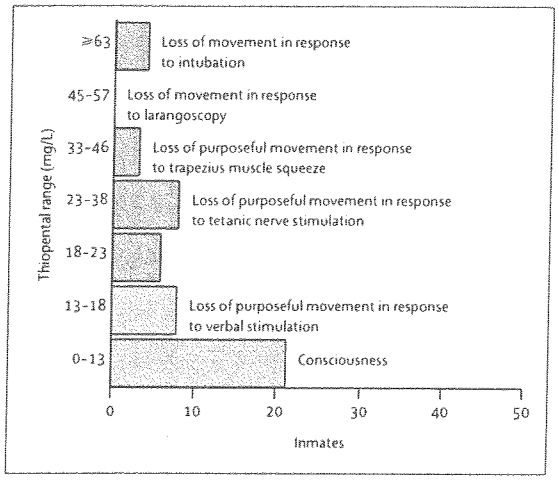

Figure 2: **Number of executed inmates with post-mortem thiopental concentrations within range for indicated clinical endpoint**
Ranges are 95% CI of the Cp50 for the stimuli.

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).[7] 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

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