

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA
Columbia Division**

Justice 360,

Plaintiff,

v.

Bryan P. Stirling, Director of the South Carolina
Department of Corrections; and Alan Wilson,
South Carolina Attorney General,

Defendants.

Civil Action No. 3:20-03671-MGL

**NOTICE OF MOTION FOR A TEMPORARY RESTRAINING ORDER AND
THEREAFTER A PRELIMINARY INJUNCTION**

Plaintiff Justice 360, by and through counsel, pursuant to Fed. R. Civ. P. 65, respectfully move the Court, on the basis of the attached declarations and exhibits, for a temporary restraining order and thereafter, a preliminary injunction enjoining Defendants from carrying out executions during the pendency of this action. Plaintiffs are an organization of capital defense attorneys whose ability to perform their duties is being violated by Defendants interpretation of S.C. Code § 24-3-580 (hereinafter, the “Identity Statute”), as applied to Justice 360. Defendants’ interpretation prevents Justice 360 from counseling their clients, consulting expert witnesses, and presenting an Eighth Amendment challenge to the Court. The result is a clear violation of their professional speech, and it is well established that loss of First Amendment freedoms, “even for minimal periods of time,” constitutes irreparable harm. *Elrod v. Burns*, 427 U.S. 347, 373 (1976)). Moreover, there is a pending execution date set for one of Justice 360’s clients on December 4,

2020, and Justice 360 is being impeded from doing its job with respect to this execution, and others that are imminent. A brief in support of this motion is attached.

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**PLAINTIFF JUSTICE 360 BRIEF IN SUPPORT OF ITS MOTION FOR A
TEMPORARY RESTRAINING ORDER AND PRELIMINARY INJUNCTION**

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INTRODUCTION

Plaintiff Justice 360—a non-profit organization whose mission includes indigent capital defense—seeks a temporary restraining order (TRO) and preliminary injunction enjoining Defendant Bryan Stirling, the Director of the South Carolina Department of Corrections, and Alan Wilson, the South Carolina Attorney General, from carrying out executions of Justice 360’s clients until the current case is resolved. Defendants have refused to give Justice 360 meaningful access to basic information about South Carolina’s execution process, including specific details about the lethal injection protocol, including but not limited to the timing, dose, and method of administration by which the state proposes to execute Justice 360’s clients. Nor do they even commit to a single method of execution, but argue that in the case of Mr. Richard Moore, scheduled to be executed on December 4, 2020, that they have reserved the right to “amend” the scant information they have released.

Defendants have cited a state statute that prohibits “knowingly disclos[ing] the identity of a current or former member of an execution team or disclos[ing] a record that would identify a person as being a current or former member of an execution team” as the basis for denying access. S.C. Code § 24-3-580 (hereinafter, the “Identity Statute”). Defendants’ interpretation of the Identity Statute, as applied to Justice 360, impermissibly burdens Justice 360’s ability to exercise its First Amendment right to counsel and advise its clients, consult with expert witnesses, and litigate a constitutional challenge under the Eighth Amendment. Justice 360’s capital defense attorneys are legally required to advise their clients on South’s Carolina’s currently-authorized methods of execution. But Justice 360’s attorneys cannot carry out these duties, nor can they determine whether to legally challenge South Carolina’s execution methods and propose an

alternative method, such as lethal gas or the firing squad, without full access to the details of how executions will be carried out.

As the Supreme Court and this Circuit have clearly articulated, professional speech—including the right to counsel a client—receives core First Amendment protections. *See Nat’l Inst. of Family & Life Advocates v. Becerra (NIFLA)*, 138 S. Ct. 2361, 2374–75 (2018); *see also Stuart v. Camnitz*, 774 F.3d 238, 247 (4th Cir. 2014). In an analogous case, the Supreme Court unequivocally held that the speech of statutorily-appointed attorneys is of particular constitutional import because it strengthens the integrity of the legal system and of the court. *Legal Servs. Corp. v. Velazquez*, 531 U.S. 533, 545–46 (2001). Our adversarial system depends on the traditional role of the attorney, which includes “complete analysis of the case, full advice to the client, and proper presentation to the court.” *Id.* at 546. Government restrictions like the Identity Statute that burden this sacred relationship violate the First Amendment. *Id.* The statute makes Justice 360’s constitutionally-protected advocacy efforts functionally meaningless. *See Jordan v. Hutcheson*, 323 F.2d 597, 601, 604 (1963). As such, Justice 360 respectfully requests that the Court declare the Identity Statute is unconstitutional as applied to Justice 360 and enjoin Defendants from carrying out executions until this case has been resolved.

STATEMENT OF FACTS

A. Justice 360’s Mission, Origin, and Clients

Justice 360 is a nonprofit organization whose mission includes promoting fairness and transparency in the criminal justice system. Justice 360 attorneys carry out this mission, in part, through direct representation of individuals facing the death penalty, the development of resources and training for other capital defense attorneys, policy advocacy for systemic reform of the administration of the death penalty, and public education. Vann Decl. ¶ 2. Justice 360 was

founded in 1989 (then under the name of the South Carolina Death Penalty Resource Center)¹ as one of several federally-funded Death Penalty Resource Centers across the country that “provide advice and support to individual attorneys who are representing clients in federal capital habeas corpus proceedings.” Report of the Committee to Review the Criminal Justice Act *18 (Judicial Conference of the U.S., 1993), 1993 WL 69540.

Lindsey Vann, the Executive Director of Justice 360, currently represents ten individuals on death row. Vann Decl. ¶ 3. As representative appointees to indigent clients in federal post-conviction proceedings, Ms. Vann and other Justice 360 attorneys “represent [death-sentenced individuals] throughout every subsequent stage of available judicial proceedings.” 18 U.S.C. § 3599(e); Vann Decl. ¶ 4, n.2. These stages include the “post-conviction process, together with applications for stays of execution and other appropriate motions and procedures, and . . . in such competency proceedings and proceedings for executive or other clemency as may be available to the defendant.” § 3599(e).

Justice 360 attorneys are licensed to practice in South Carolina and are therefore subject to the professional licensing requirements and ethical restrictions embodied in the South Carolina Rules of Professional Conduct and the South Carolina Appellate Court Rules. See Rule 410, SCACR (describing the role of the South Carolina Bar in enforcing licensing requirements and ethical obligations of attorneys in South Carolina); Scope of Rule 407, SCACR (explaining that the South Carolina Rules of Professional Conduct “provide a framework for the ethical practice of law” and that a violation of the rules may trigger “enforcement through disciplinary proceedings”). As the South Carolina Rules note, attorney ethical obligations are premised on “a larger legal context” that takes into account the nature of an attorney’s representation and “laws defining

¹ <https://justice360sc.org/history/> (last visited Oct. 13, 2020).

specific obligations of lawyers and substantive and procedural law in general.” Rule 407(2), SCACR. Because Justice 360 attorneys represents death-sentenced inmates, and because the consequences of unethical or insufficiently zealous representation may be the loss of life or unconstitutional suffering, a heightened set of ethical obligations applies to their work. Accordingly, “[i]t is universally accepted that the responsibilities of defense counsel in a death penalty case are uniquely demanding, both in the knowledge that counsel must possess and in the skills he or she must master.” American Bar Association, Guidelines for the Appointment and Performance of Defense Counsel in Death Penalty Cases, 31 Hofstra L. Rev. 913, 923 (2003) (ABA Guidelines).

Capital defense attorneys regularly “counsel[] their clients about one of the most difficult decisions any human being could ever make”: the decision how to die when the choice is between two manners with known, and possibly substantial, risks of severe pain. *Wendel Decl.* ¶ 8. Not only does South Carolina have an Identity Statute, it also has a choice-of-execution law that permits death-sentenced individuals to elect between execution by lethal injection or execution by electrocution. Specifically, the statute provides:

A person convicted of a capital crime and having imposed upon him the sentence of death shall suffer the penalty by electrocution or, at the election of the person, lethal injection under the direction of the Director of the Department of Corrections. The election for death by electrocution or lethal injection must be made in writing fourteen days before the execution date or it is waived. If the person waives the right of election, then the penalty must be administered by lethal injection.

S.C. Code § 24-3-530(A). However, capital defense attorneys must counsel their clients not only about the methods provided for under state law, but where those choices pose a “substantial risk of severe pain,” the attorneys must also be prepared to advise their clients about other alternative forms of execution. *See Baze v. Rees*, 553 U.S. 35, 52 (2008) (plurality opinion). This is because,

under the Supreme Court’s interpretation of the Eighth Amendment’s prohibition on cruel and unusual punishment, a condemned person may only raise a challenge to the method of their execution if they can show “a feasible and readily implemented alternative method of execution . . . that the State has refused to adopt without a legitimate penological reason.” *Bucklew v. Precythe*, 139 S. Ct. 1112, 1125 (2019). In identifying an alternative, inmates are “not limited to choosing among those presently authorized by a particular State’s law.” *Id.* at 1128. Thus, in order for Justice 360 attorneys to adequately represent clients who are facing imminent execution, the attorneys must be made aware of the specific means by which the State plans to carry out executions; without this information, they can neither prepare their clients for death, nor prepare any potential litigation to challenge the means of their deaths.

B. SCDC’s Refusal to Disclose Information about its Execution Protocol

In the past, the South Carolina Department of Corrections (“SCDC”)—like other departments of corrections around the country—made its execution protocols available to capital defense attorneys upon request. *See, e.g.*, Vann Decl., Ex. F. For instance, the 2002 execution protocol included the specific drugs to be used as well as the doses and in what order to be administered, *id.* at 13., a list of qualification and the titles of individuals on the execution team (for example, physicians, EMTs, electricians, religious advisors, attorneys, etc.), *id.* at 8–9, tables describing the process by which SCDC would carry out each method of execution and, and schedules detailing the timing of executions, tasks assigned to each member of the execution team, and other logistical information, *id.* at 8–9, 12–15. The protocols were extremely specific and gave attorneys, condemned people, and members of the execution team equally detailed information about what they could expect, down to the moment. As an example, 2002 protocol stated that at least ten minutes before an execution by electrocution, “[a]n Execution Team

Member will apply conducting gel to the calf of the inmate's right leg and the crown of the inmate's head." *Id.* at 13. The last time SCDC released an execution protocol was June 1, 2008. *See id.*

In 2010, South Carolina enacted the Identity Statute prohibiting individuals from "knowingly disclos[ing] the identity of a current or former member of an execution team or disclos[ing] a record that would identify a person as being a current or former member of an execution team." S.C. Code § 24-3-580. The statute specifies that the "this information may be disclosed only upon a court order under seal for the proper adjudication of pending litigation" such as the present litigation. *Id.* However, the statute imposed additional penalties for disclosure outside of a court-ordered disclosure, providing that "[a]ny person whose identity is disclosed in violation of this section shall have a civil cause of action against the person who is in violation of this section and may recover actual damages and, upon a showing of a wilful [sic] violation of this section, punitive damages." *Id.* In 2015, the South Carolina Attorney General broadly interpreted the definition of "member of an execution team" to include the identity of lethal injection drug suppliers. S.C. Att'y Gen. Op., 2015 WL 4699337 (S.C.A.G. July 27, 2015).

On September 1, 2020, given the possible pending execution of several inmates, Ms. Vann wrote to Mr. Stirling on behalf of Justice 360 requesting information regarding SCDC's lethal injection and electrocution protocols, information regarding the training and experience of the executioners for both protocols, and details regarding how each option for execution would be carried out. Vann Decl., Ex. B. On September 29, 2020, the Chief Legal and Compliance Officer of SCDC responded to these requests, saying, "we do not have any of the drugs in our possession to perform an execution by lethal injection." *Id.* at Ex. C. SCDC also refused to turn over the current lethal injection protocol, information regarding suppliers or compounders of the lethal injection drugs, information about execution personnel, or any of the requested details regarding

how an electrocution would be carried out. *Id.* In support of its decision not to disclose any information about its execution protocols, SCDC cited a 2015 opinion from the South Carolina Attorney General that “broadly construed” the Identity Statute to include “an individual or company providing or participating in the preparation of chemical compounds” intended for use in executions. *Id.*; Opinion of the S.C. Att’y General, 2015 WL 4699337, at *4 (July 27, 2015).

After this letter, Justice 360 filed suit, challenging Defendants’ refusal to produce this information as an impingement of Justice 360’s rights under the First Amendment. Compl. at 3, ECF No. 1. On November 18, 2020, opposing counsel informed Moore’s attorneys that they would be asked to comply with the following list of “logistics for review”:

1. At SCDC headquarters
2. We can be flexible on the time
3. Members of Mr. Moore’s defense team
4. Protocols will be available in a conference room for your review
5. No copies will be given
6. No photos or other verbatim copying of the protocols would be allowed
7. Notes can be taken but any notes must be held confidential and only used to advise Mr. Moore as he chooses his election pursuant to SC Code 24-3-530.

Vann Decl. ¶ 25. Moore’s counsel made arrangements with opposing counsel to meet at SCDC headquarters at 1:00 p.m. on November 19 to review the protocols, subject to the above noted restrictions. *Id.*

At 9:13 a.m. on November 19, counsel for SCDC informed Moore’s attorneys that they needed to arrive 15–20 minutes earlier, between 12:40 and 12:45 p.m. *Id.* ¶ 26. Then, at 12:19 p.m., less than thirty minutes before Moore’s counsel had been instructed to arrive at SCDC headquarters, SCDC’s general counsel sent Moore’s counsel a “confidentiality agreement.” *Id.* The “agreement” was a copy of a contract that Moore’s attorneys would be required to sign before viewing the protocols. The “agreement” included the following paragraph:

Receiving Parties agree that any breach of this Agreement by any Receiving Party will cause irreparable harm to SCDC, its employees, and any potential member of the execution team for the execution of Richard Bernard Moore, that cannot be adequately compensated with money damages. Accordingly, SCDC shall be entitled to injunctive relief to enforce this Agreement, in addition to damages and other available remedies, to include, but not be limited to, reasonable attorneys' fees. In the event SCDC is required to enforce the terms of this Agreement in order to remedy or prevent any breach of this Agreement, the Receiving Party shall, in addition to any other damages for which it is responsible hereunder, pay and reimburse to SCDC the reasonable attorneys' fees and costs of SCDC associated with such enforcement.

After reviewing this provision, Moore's counsel indicated to opposing counsel that they would no longer be attending the meeting scheduled for 1:00. *Id.* ¶ 26.

On November 20, 2020, Plaintiff advised Mr. Moore that they did not have adequate information to counsel him on which mode of punishment to choose. *Id.* ¶ 27. Thus, when presented with the notice of election by SCDC officials, Moore refused to sign and wrote "I can not make a selection at this time to method because my attorney and I do not have information for the protocols. By not selecting does not mean I waive my right to select." *Id.* at Ex. J.

Then, later on November 20, 2020, Defendants' counsel wrote Ms. Vann providing vague, non-binding, limited information about South Carolina's execution protocol, stating,

SCDC's current lethal injection protocol is a three-drug protocol, which begins with an injection of Pentobarbital, followed as an appropriate time interval by Pavulon (Pancuronium Bromide), and then followed at an appropriate time interval by Potassium Chloride.

Id. at Ex. L. The letter noted that a "similar" protocol was found to be constitutional in *Baze*, 553 U.S. at 45—though that protocol was far more detailed and provided far more information than the information offered here. *Id.* Defendants also "reserve[d] the right to amend its lethal injection protocol," and noted that "if it is unable to secure sufficient quantities of each of the three drugs

listed above, it is prepared to enact a one-drug protocol, which would consist of the use of Pentobarbital Sodium.” *Id.*

As discussed further herein, this information is wholly insufficient for experts to conduct the requisite analyses of Defendants’ execution protocol. At the most basic level, Defendants do not actually commit to a specific protocol; Defendants present two different options, and reserve the right to amend all together. Additionally, the information supplied is not sufficiently detailed. For instance, Defendants state that the protocol is “similar” to that in *Baze*—not identical—and do not provide essential attributes including, but not limited to, the timing, dosage, method of administration, and source of the drugs.

C. Justice 360 Attorneys’ Unique Relationships with Clients

Each representation Justice 360 undertakes requires its attorneys to engage with their client to develop a “relationship of trust,” which is necessary to “overcome the client’s natural resistance to disclosing the often personal and painful facts” that attorneys require in order to present an effective defense in a capital case. Commentary to ABA Guideline 10.5, 31 Hofstra L. Rev. at 1007. This heightened trust is also essential in ensuring that a client will “listen to counsel’s advice on important matters.” *Id.* “[T]he relationship between defense counsel and a capitally-sentenced inmate is the most sensitive one any lawyer can have with a client.” Wendel Decl. ¶ 11.

Take, for example, Ms. Vann’s representation of Mr. Moore, who was sentenced to death in South Carolina in 2001. Vann Decl. ¶ 4. Ms. Vann began this representation six years ago, when Mr. Moore’s case entered federal habeas proceedings. *Id.* The proceedings have gone through multiple stages of litigation, including “four levels of judicial review” and “a second post-conviction proceeding in a state trial court.” *Id.* ¶ 14. Over the course of this representation, Ms. Vann has come to know Mr. Moore’s family, including his children, with whom Mr. Moore is

particularly close. *Id.* Ms. Vann has discussed the intimate details of Mr. Moore’s life, and over time, Ms. Vann has become “the person Mr. Moore speaks to the most often and depends on for advice in various areas of his life.” *Id.* Ms. Vann must stay informed of Mr. Moore’s personal condition (such as actions by prison authorities and changes in Mr. Moore’s mental state) as it may have legal consequences that affect her ability to represent him. Commentary to ABA Guideline 10.5, 31 Hofstra L. Rev. at 1010–11; Vann Decl. ¶ 16; Wendel Decl. ¶¶ 17–20.

Many individuals on death row “are cognitively impaired or have mental health problems, many of which are exacerbated during times of stress.” Vann Decl. ¶ 16. “[T]he prevalence of mental illness and impaired reasoning is so high in the capital defendant population that ‘it must be assumed that the client is emotionally and intellectually impaired.’” Commentary to ABA Guideline 10.5, 31 Hofstra L. Rev. at 1007 (quoting Rick Kammen & Lee Norton, *Plea Agreements: Working with Capital Defendants*, *The Advocate*, Mar. 2000, at 31. These mental health problems and cognitive impairments “complicate[]” a capital defense attorney’s ability to have meaningful discussion with each individual regarding his rights, which “heightens the individual’s dependence on his attorney’s advice and counsel to make legal decisions.” Vann Decl. ¶ 16. Even inmates without cognitive or mental health problems are, in practice, dependent on their lawyers as a result of the isolation incident to confinement on death row; the dependency and isolation have severe psychological consequences, which have only been exacerbated by COVID-19 restrictions. Wendel Decl. ¶ 10. For example, Mr. Moore is currently isolated from his family due to COVID and the fact that Mr. Moore’s children have “traveled overseas for significant periods of time” and Ms. Vann is his primary point of contact. Vann Decl. ¶ 14. Ms. Vann “had initial conversations with Mr. Moore about the fact that South Carolina law allows him the choice between lethal injection and electrocution. During these discussions, Mr. Moore asked

many questions that [Ms. Vann] could not answer because [she did] not know how SCDC plans to carry out either method.” *Id.* ¶ 15. “The unknowns and inability to receive advice on this important and unparalleled decision is a source of stress for Mr. Moore (and [Ms. Vann] as well).” *Id.*

D. Expert Opinions on the Substantial Risk of Severe Pain

To competently advise clients on these complicated questions and to assess the viability of an Eighth Amendment challenge, a lawyer must “provide[] a client with an informed understanding of the client’s legal rights and obligations and explain[] their practical implications.” Preamble to Rule 407(3), SCACR. “National standards on defense services” recognize that a lawyer cannot provide her client an informed understanding unless the lawyer has “access to adequate . . . expert witnesses.” Commentary to ABA Guideline 4.1, 31 Hofstra L. Rev. at 955 (internal quotation marks omitted).

Consistent with these ethical obligations, Justice 360 consulted with numerous experts and provided those experts with all of the information SCDC has given to Justice 360 even with the new information provided by the SCDC on November 20, 2020. However, every expert Justice 360 consulted indicated that, even with the new information provided, without this more specific information, they were unable to offer opinions about which manner of death the organization’s clients should elect or whether the clients will face a “substantial risk of severe pain.” *E.g.* Waisel Decl. ¶ 2 (explaining that without the “basic details about South Carolina’s . . . protocol,” expert witnesses “cannot form an opinion”). “This lack of information also prevents [experts] from effectively conveying to any death penalty counsel, such as Justice 360, an assessment of the risk of severe pain posed by this protocol.” *Id.* In the words of Dr. David B. Waisel, an anesthesiologist from Yale, attempting to formulate an opinion about the substantial risk of severe pain “would be

like trying to determine how many pins a bowler struck down in an alley located across town.” *Id.* ¶ 12.

For example, Dr. Waisel is willing to give Justice 360 an opinion about the risks in SCDC’s lethal injection protocol, but to do so, Dr. Waisel would need information including, but not limited to, the “chemicals in the lethal injection combination and the doses in which they will be administered,” *id.* ¶ 14; “their purity, potency, pH, and concentration,” *id.* ¶ 18; “the precise method of administration,” *id.* ¶ 25; “[a] close examin[ation of] South Carolina’s execution facilities,” *id.* ¶ 29; the positioning, number, and use of IV lines, *id.* ¶ 25; the “qualifications of the members of the execution team,” *id.* ¶ 20; and whether the state has a backup plan, *id.* ¶ 28.

Similarly, pharmacology experts can assess “the elements of a lethal injection chemical formulation necessary to determine if a lethal injection drug is fit for its intended use, and whether there is a risk of the chemical formulation causing a botched execution.” Ruble Decl. ¶ 5. To make this determination, pharmacology experts need information including:

- a. the specific chemicals South Carolina plans to use during an execution by lethal injection
- b. the specific formula for each chemical, including the active and inactive ingredients
- c. the manufacturer, source requirements, storage requirements and chain of custody for each specific chemical
- d. the qualifications of the people who compounded the drug
- e. whether the compounding pharmacy is a licensed pharmacy, whether it has been sanctioned, and the results of the pharmacy’s most recent inspection results.

Id. ¶ 33. Pharmacological and anesthesiologist experts need to know “information about a drug’s source, purity, potency, and formulation,” *id.* ¶ 12, because “[i]f a subpotent dose of a drug is administered to an inmate . . . the drug will not have its intended effect absent additional doses [and injecting] additional doses of a subpotent drug can increase the risk of a prolonged execution, and in turn, substantially increase the risk of severe pain.” Waisel Decl. ¶ 18; Ruble Decl. ¶ 26.

For example, in Joseph Wood’s 2014 execution in Arizona, the execution team administered a dose of lethal injection drugs fifteen times greater than was prescribed in the state’s lethal injection protocol.² Waisel Decl. ¶ 19. As a result, Mr. Wood’s execution lasted for nearly two hours, during which he took deep long breaths “like he was drowning.”³ An eyewitness reporter counted Mr. Wood “gulp[] like a fish on land” more than 640 times.⁴ Senator John McCain described Mr. Wood’s execution as a “bollocks-upped situation” that amounted to “torture.”⁵

Compounding pharmacies, which Director Stirling indicated at a legislative hearing would be a potential source of the drugs here, are subject to less FDA scrutiny than other commercial product manufacturers under 21 U.S.C. § 353(a)-(b) and “vary significantly” in term of whether they follow the regulations, such that “the majority of compounding pharmacies are not equipped to provide sterile formulations.” *Id.* ¶ 20. Without sufficient regulatory oversight, compounding pharmacies are more likely to sell degraded drugs that are more prone to crystallization, “which would be expected to cause severe pain during intravenous injection of the compounded drug.” Ruble Decl. ¶ 27. Thus, if SCDC does rely on a compounding pharmacy to procure lethal injection drugs, expert witnesses cannot opine about the risks or lack thereof inherent in any specific lethal injection protocol unless the experts have access to details about the compounding facility, the supply chain for that facility, and the storage and refrigeration protocols adopted by SCDC.

² See Tom Dart, *Arizona inmate Joseph Wood was injected 15 times with execution drugs*, *Guardian* (Aug. 2 2014), <https://www.theguardian.com/world/2014/aug/02/arizona-inmate-injected-15-times-execution-drugs-joseph-wood>.

³ Josh Sanburn, *Inside the Efforts to Halt Arizona’s Two-Hour Execution of Joseph Wood*, *Time* (July 24, 2014), <https://time.com/3026985/joseph-wood-arizona-lethal-injection-botched/>.

⁴ Michael Kiefer, *Reporter Describes Arizona Execution: 2 hours, 640 gasps*, *Arizona Republic* (updated Nov. 6, 2014), <https://www.azcentral.com/story/news/arizona/politics/2014/07/24/arizona-execution-joseph-wood-eyewitness/13083637/>.

⁵ Burgess Everett, *McCain: Arizona Execution “Torture,” Politico* (updated July 25, 2014), <https://www.politico.com/story/2014/07/john-mccain-arizona-execution-109350>.

Finally, experts in electrocution—the other option for execution under South Carolina law—cannot assist Justice 360 in determining the “efficacy, potential problems, scientific and technical issues and risks of severe pain” in electrocution protocols absent access to the requested information. Wikswo Decl. ¶ 2. To form a professional opinion, electrocution experts need information including, but not limited to, the source of the electrical current; the electrical resistance of the inmate; “the nature of the electrical connection to the inmate, including what type of electrodes and sponges will be used and the saline content of the solution;” whether safety equipment will be available; and whether there is a backup plan. *Id.* ¶ 8. For example, Florida blamed the botched execution of Jesse Tafero on the improper training of the executioners and their use of an artificial sponge—as opposed to a natural sea sponge—which weakened the electrical current. Roberta M. Harding, *The Gallows to the Gurney: Analyzing the (Un)Constitutionality of the Methods of Execution*, 6 B.U. Pub. Int. L.J. 153, 167 (1996). Mr. Tafero was still breathing following a first surge of electricity—during which twelve-inch flames emanated from his head, *id.* at 173—so the state electrocuted Mr. Tafero two more times, “charring” his flesh and causing it to “peel[] away from [his] skull.” *Buenoano v. State*, 565 So. 2d 309, 314 (Fla. 1990) (Kogan, J., dissenting). Defendants have not provided Justice 360 the information that experts in anesthesiology, pharmacology, and electrocution require to provide opinions to capital defense attorneys, and thus experts are unable to help Justice 360 advise its clients how to die, or to bring an independent Eighth Amendment challenge. Email from SCDC FOIA Office to Lindsey Vann, Oct. 21, 2020.

LEGAL STANDARD

Courts should grant injunctive relief where the plaintiff establishes that (1) he or she is likely to succeed on the merits; (2) he or she is likely to suffer irreparable harm in the absence of

preliminary relief; (3) the balance of equities tips in his or her favor; and (4) that an injunction is in the public interest. *See Planned Parenthood S. Atl. v. Baker*, 326 F. Supp. 3d 39, 43 (D.S.C. 2018), *aff'd*, 941 F.3d 687 (4th Cir. 2019), *cert. denied sub nom. Baker v. Planned Parenthood*, No. 19-1186, 2020 WL 6037212 (U.S. Oct. 13, 2020) (Lewis, J.).

A TRO is “intended to protect the status quo and prevent irreparable harm during the pendency of a lawsuit.” *Id.* The standard for a TRO is the same as that of a preliminary injunction. *MJJG Rest., LLC v. Horry Cty., S.C.*, 11 F. Supp. 3d 541, 550 (D.S.C. 2014) (Lewis, J.). Although both are disfavored as a general matter, in free speech cases, the standard is more forgiving if the speech is content- or viewpoint based—a determination that “takes into account the purpose for which the regulation was adopted.” *Id.* at 551. For example, a government’s stated purpose can be “supported by ‘evidence of the adverse secondary effects’ of the speech it is meant to regulate—evidence that is “presented in hearings and in reports” and on “findings, interpretations, and narrowing constructions’ in several relevant federal and South Carolina cases.” *Id.* at 553. In such cases, the burden does fall on the plaintiff to demonstrate “by a clear showing that, among other things, it is likely to succeed on the merits at trial.” *Id.* at 556. (internal citation and quotations omitted). To be clear, an as-applied challenge is subject to lesser requirements than a facial challenge, and the plaintiff does not bear the burden of showing that there is no “limiting construction or partial invalidation [that] could remove the seeming threat or deterrence to constitutionally protected expression.” *Id.* (internal citation and quotations omitted).

ARGUMENT

I. Justice 360 Will Likely Succeed on the Merits.

A. Justice 360 has a First Amendment Right to the Execution Protocols.

Justice 360 is likely to prevail on its claim that Justice 360 has a First Amendment right to the information it seeks: That is because the government is actively interfering via the Identity Statute in an existing professional relationship between a government funded attorney and its clients by cutting off access to information that was previously made available to these attorneys upon request. The result is a deprivation of rights, and a burden to Justice 360's professional speech.

The First Amendment extends to professional advice. *See, e.g., NIFLA*, 138 S. Ct. at 2374–75. As a mission-driven legal services organization, Justice 360 has broad professional speech rights because it uses litigation as a “‘form of ‘political expression’ and ‘political association.’” *In re Primus*, 436 U.S. 412, 428 (1978) (quoting *NAACP v. Button*, 371 U.S. 415, 429, 431 (1963)). Just as in the canonical Supreme Court case *Velasquez*, where the government-funded lawyers were forbidden from mounting constitutional challenges, here the Identity Statute prevents Justice 360 from advance sound legal arguments that subject government conduct to effective judicial review and safeguard against irrevocable infliction of an unconstitutional punishment. *See Velazquez*, 531 U.S. at 544. The Identity Statute should equally be held invalid as applied because it curtails Justice 360's ability to advise clients, consult experts, and assist the Court in assessing the constitutional validity of a given method of execution. *Compare id.* Indeed, these are protected activities that the Supreme Court has recognized as “undertaken to obtain meaningful access to the courts[, which] is a fundamental right within the protection of the First Amendment.” *See United Transp. Union v. State Bar of Mich.*, 401 U.S. 576, 585 (1971).

1. Defendants' conduct burdens Justice 360's ability to communicate with clients.

The Supreme Court and Courts of Appeal throughout the country have long recognized that mission-driven or legal service attorneys have a First Amendment right to “associate with and advise persons regarding their legal rights.” *Haitian Centers Council, Inc. v. Sale*, 823 F. Supp. 1028, 1040 (E.D.N.Y. 1993) (citing *Primus*, 436 U.S. at 428; *Button*, 371 U.S. at 429); *see also Jean v. Nelson*, 711 F.2d 1455, 1508–09 (11th Cir. 1983), *on reh'g*, 727 F.2d 957 (11th Cir. 1984), *aff'd*, 472 U.S. 846 (1985); *Velazquez*, 531 U.S. at 545–46. Professional advice in the context of the attorney-client relationship is particularly sacred because the attorney-client relationship “is one of special consequence.” *Caplin & Drysdale, Chartered v. United States*, 491 U.S. 617, 623 n.3 (1989); *see also CSX Transp., Inc. v. Gilkison*, 5:05-CV-202, 2011 WL 5445114, at *2 (N.D.W. Va. Nov. 9, 2011) (noting the importance of “preserv[ing] the integrity of the attorney-client relationship”).

Attorney-client communications—particularly communications between prisoners and their counsel—are “sui generis” and of deep constitutional import. *Wells v. McGinnis*, 344 F. Supp. 594, 596 (S.D.N.Y. 1972). There is “widespread agreement that communications . . . between an inmate and [their] attorney are sacrosanct.” *Adams v. Carlson*, 488 F.2d 619, 631 (7th Cir. 1973) (collecting cases). Such communications are characterized by a unique level of loyalty and trust, are foundational to the protection of constitutional rights, and ensure the integrity of our judicial system. *See id*; *see also, e.g., Wells*, 344 F. Supp. at 596 (noting “[c]hannels of [such] communication[s] . . . must be kept open”). Disruptions to the attorney-client relationship, including burdens on attorneys’ ability to “regularly have meaningful in-person meetings with their clients, regularly review discovery with them, or thoroughly advise them about the

consequences of going to trial” have “broad[] implications for the Court and the administration of justice.” *United States v. Davis*, 449 F. Supp. 3d 532, 541 (D. Md. 2020). Given the sacred nature of the attorney-client relationship, restrictions which interfere with established, ongoing attorney-client relationships are invalid. *Velazquez*, 531 U.S. at 545–46; *see also Torres v. United States Dep’t of Homeland Sec.*, 411 F. Supp. 3d 1036, 1061 (C.D. Cal. 2019).

Defendants’ decision to conceal the execution protocols unconstitutionally disrupts the attorney-client relationship and truncates the scope of professional advice Justice 360 can provide to its clients, and this interference impedes Justice 360’s professional speech rights. *See, e.g., Velazquez*, 531 U.S. at 544; *Primus*, 436 U.S. at 428; *Button*, 371 U.S. at 429. First, and most basically, Justice 360’s “most fundamental obligation” is to “provide competent and diligent representation in the service of the best interests of [its] client[s].” *Wendel Decl.* ¶ 8. Here, that obligation involves providing advice and advocacy “about one of the most difficult decisions any human being could ever make”: how to die. *Id.* Specifically, Justice 360 must counsel its clients about whether lethal injection or electrocution presents a lesser risk of serious pain and suffering, whether there are any feasible alternatives that are likely to reduce that risk, and if so, whether to bring an Eighth Amendment challenge proposing that alternative. *See Bucklew*, 139 S. Ct. at 1125; *see also Button*, 371 U.S. at 429 (holding attorneys have a First Amendment right to counsel clients regarding their constitutional protections). High rates and gruesome examples of botched executions, the use of unapproved and unregulated drug suppliers, and substantial deviations from devised execution protocols all underscore inmates’ serious need for informed, comprehensive advice in order to make this momentous decision. *See generally* *Waisel Decl.*; *Ruble Decl.*

Moreover, the need for informed, comprehensive counsel is amplified because in a capital post-conviction case, a statutorily regulated capital defense attorney’s “role as advisor to their

client takes on unique importance.” *See* Vann Decl. ¶ 12. As Ms. Vann explains, capital defense attorneys represent their clients for many years and have an obligation to thoroughly discuss the most intimate details of their clients’ lives with their clients and their families. *Id.* ¶ 13. As explained throughout, in the capital context, the attorney-client relationship is characterized by an exceptional level of trust and confidence, and death row inmates tend to place heightened emphasis on the advice of their attorney. Vann Decl. ¶ 13. The special role of capital defense attorneys is intensified by the fact that many death row inmates are “cognitively impaired or have mental health problems,” which “heightens the individual’s dependence on his attorney’s advice and counsel to make legal decisions.” Vann Decl. ¶ 16.

Defendants’ conduct prevents Justice 360 from developing the specialized, professional advice upon which its clients so intensely rely, because Justice 360 is unable to do so in an informational vacuum and without the benefit of expert analysis. Ruble Decl. ¶ 4–5, 31–33; Waisel Decl. ¶ 4. Indeed, both experts conclude that even the November 20 disclosures by the SCDC are insufficient for them to advise Justice 360. Ruble Decl. ¶ 4, 30–31; Waisel Decl. ¶ 4. Consequentially, Justice 360 cannot perform its essential role of advising its clients about how to make legally significant decisions and preserve and enforce their constitutional rights. *See* Vann Decl. ¶ 15. Here, as in *Velasquez*, there is “no alternative source for the client to receive [this] vital information,” and Defendants’ refusal to produce the information violates Justice 360’s rights under the First Amendment by “prohibit[ing] [attorney] advice or argumentation” that SCDC’s policies are unconstitutional or unlawful. 531 U.S. at 546–47.

Not only is the attorney-client relationship “of considerable constitutional significance,” but “[i]t is also of overriding *ethical* significance.” Wendel Decl. ¶ 12 (emphasis in original). As Professor Wendel, a legal ethicist who has done extensive work in the capital defense arena,

explains, the attorney-client relationship—and the capital attorney-client relationship in particular—is “highly fiduciary in nature, and lawyers are subject to demanding duties of loyalty and care.” *Id.* ¶ 17. A “state’s regulation of professional speech must be consistent with the goals and duties of the profession.” *Stuart v. Loomis*, 992 F. Supp. 2d 585, 597 (M.D.N.C. 2014), *aff’d sub nom. Stuart v. Camnitz*, 774 F.3d 238 (4th Cir. 2014). But suppressing Justice 360’s ability to provide reliable, comprehensive professional advice bearing on its clients’ constitutional rights is diametrically opposed to legitimate interests in ensuring the skill and integrity of the legal profession and is at odds with the ethical duties imposed upon South Carolina attorneys. *See* Wendel Decl. ¶ 20.

By refusing to provide sufficient details of the execution protocol—and by refusing to commit to a specific execution protocol—Defendants have forced Justice 360 into an impossible position: under the State’s legal ethics rules, Justice 360 must competently represent its clients but as a direct result of SCDC’s refusal to turn over the information, Justice 360’s clients will receive unethical representation. *Id.* ¶¶ 13–15; *see also Camnitz*, 774 F.3d at 248 (noting in the context of a free speech challenge to a state’s regulation of a profession that “[t]he government’s regulatory interest is less potent in the context of a self-regulating profession”). Legal ethicists widely agree that the goals and duties of the profession counsel in favor of transparency and robust judicial oversight in the context of capital punishment. *See, e.g., American Bar Association, Resolution 108B* (February 9, 2015) (hereinafter, ABA 108B).⁶

2. Defendants’ conduct burdens Justice 360’s ability to communicate with experts.

First Amendment professional speech protections include the right to engage in mission-driven litigation and all “cooperative activity that would make advocacy of litigation meaningful.”

⁶Available at https://www.americanbar.org/content/dam/aba/images/abanews/2015mm_hodres/108b.pdf.

See Primus, 436 U.S. at 433 (quoting *Button*, 371 U.S. at 438). As the Fourth Circuit itself established, “collective activity undertaken to obtain meaningful access to the courts is a fundamental right.” *Capital Associated Indus., Inc. v. Stein*, 922 F.3d 198, 205 (4th Cir. 2019), *cert. denied*, 140 S. Ct. 666 (2019) (citing *United Transp. Union*, 401 U.S. at 585–86). This right encompasses an attorney’s ability to “access [] information about [their] client, in order to prepare her case.” *St. John v. McElroy*, 1996 WL 49956, at *2 (S.D.N.Y. Feb. 6, 1996).

In the context of death penalty litigation, constitutionally protected cooperative activity undoubtedly includes Justice 360’s ability to consult expert witnesses in order to make an informed assessment of whether the state’s proposed execution method poses a substantial risk of severe pain as applied to a particular inmate, and how that risk compares to readily implemented alternatives. *Id.* Nor is this right limited to information that would ordinarily be made available through discovery—the Supreme Court has made clear it extends to pre-discovery cooperative activity that makes litigation meaningful. *See Bhd. of R. R. Trainmen v. Virginia ex rel. Va. State Bar*, 377 U.S. 1, 5–6 (1964).

As emphasized throughout, capital defense attorneys are tasked with a uniquely awesome and sobering responsibility: advising their client how to die. Vann Decl. ¶ 10; Wendel Decl. ¶ 11. Pursuant to the choice-of-execution statute, when an execution date is imminent, Justice 360 must counsel its clients about which method presents a less significant risk of pain and suffering, including with regard to the clients’ particular health condition or medical history. Vann Decl. ¶ 17; *see also St. John*, 1996 WL 49956, at *2. This advice is of deep significance because the attorney client relationship is exceptionally sacred in the context of capital punishment; “[i]n capital cases, the client literally trusts his life to his lawyer and her legal decisions and advice.” Vann Decl. ¶ 13. This advice is also deeply significant because Justice 360 is the last line of

defense between their clients and the irrevocable harm of an unconstitutional execution. Whether a proposed execution method violates the Eighth Amendment depends on how that method compares to feasible, readily implemented alternatives, including alternatives not presently authorized by state law. *See Bucklew*, 139 S. Ct. at 1125. Accordingly, to safeguard their clients' Eighth Amendment rights, Justice 360 must not only counsel their clients about the comparative risks of lethal injection and electrocution—Justice 360 must also counsel their clients about how these statutorily-authorized methods compare to feasible alternatives, such as the lethal gas or the firing squad, that the legislature has declined to implement. *See Vann Decl.* ¶ 6.

Justice 360 is unable to conduct this comparative analysis without the benefit of expert opinion. *Id.* ¶ 18; *see Trainmen*, 377 U.S. at 5–6. As noted above, none of the potential experts Justice 360 has consulted can form an opinion of the substantial risk of severe pain of a given method of execution—information that Justice 360 requested, was historically provided, and has now been cut off. *Ruble Decl.* ¶ 4–5, 31–33; *Waisel Decl.* ¶ 4. Discerning whether a given method of execution poses a substantial likelihood of severe pain is a highly technical exercise, requiring knowledge and experience that Justice 360 alone does not possess, and requires Justice 360 to retain an anesthesiologist, a pharmacologist, and experts on the electric chair. *Vann Decl.* ¶ 18; *see St. John*, 1996 WL 49956, at *2.

In the context of lethal injection, to form legally sound advice regarding the state's proposed lethal injection protocol, Justice 360 has engaged experts in anesthesiology, such as Dr. Waisel. Dr. Waisel has been practicing within this specialty for almost 28 years and is Chief of the Pediatric Anesthesia Division and a Professor of Anesthesiology at the Yale School of Medicine. *Waisel Decl.* ¶ 1. To determine the risk of pain a proposed lethal injection protocol presents, Dr. Waisel would draw on his decades of experience and consider myriad factors,

including the drug sequencing, dosage, and details that affect the administration of lethal injection chemicals. *Id.* ¶¶ 33–35. With this information, Dr. Waisel could evaluate whether the protocol is sound and likely to function as intended, or whether it presents a substantial risk of severe pain due to, for instance, unintended scenarios such as flash pulmonary edema or precipitation. *Id.*

Additionally, Justice 360 has retained an expert in pharmacology, Dr. James H. Ruble. Dr. Ruble is a registered, practicing pharmacist who has over 25 years of experience, and is an Associate Professor (Clinical) in the Department of Pharmacotherapy and an Adjunct Associate Professor in the Department of Pharmaceutics and Pharmaceutical Chemistry at the University of Utah College of Pharmacy, as well as an Adjunct Associate Professor in the Program in Medical Ethics and Humanities, Department of Internal Medicine, University of Utah School of Medicine. Ruble Decl. ¶ 2. To anticipate how a proposed lethal injection protocol would impact an inmate, Dr. Ruble would consider, among other factors, “source, purity, potency, and formulation.” *Id.* ¶ 12. With this information, Dr. Ruble could assess the validity and reliability of the proposed lethal injection protocol, including whether the protocol is likely to inflict needless pain. *Id.* ¶¶ 32–33.

Likewise, to form legally sound advice regarding the state’s proposed electrocution protocol, Justice 360 has engaged experts in electrical engineering, such as Dr. John P. Wikswo, Jr. Dr. Wikswo has over 20 years of experience investigating judicial electrocution protocols and electrocution equipment. Wikswo Decl. ¶ 2. He is the Founding Director of the Vanderbilt Institute for Integrative Biosystems Research and Education, and a Professor of Living State Physics, Biomedical Engineering, Molecular Physiology & Biophysics, and Physics. *Id.* ¶ 1. To assess “the risks, efficacy, reliability, and potential scientific or technical problems with the electrocution protocol and equipment,” Dr. Wikso would analyze an array of factors, including the current, voltage, duration, frequency, and nature of electrical connection to the inmate. *Id.* ¶ 6, 8.

The purpose of these engagements is to help Justice 360's provide its clients with an informed understanding of the practical risks and implications of their legal rights and choices, including their choice to (1) elect to die by lethal injection; (2) elect to die by electrocution, or (3) bring an Eighth Amendment challenge proposing an alternative method of execution, such as the firing squad or lethal gas. *See* Vann. Decl. ¶ 6. But neither Dr. Waisel, Dr. Ruble, nor Dr. Wikswow are able to give their expert opinion of South Carolina's statutorily-authorized methods of execution. That is because without access to detailed information about South Carolina's lethal injection and execution protocols they do not have adequate information on which to base their assessment of the substantial risk of severe pain entailed by how each protocol is carried out, and are thus entirely unable to conduct a comprehensive analysis of potential execution methods upon which Justice 360 and its clients can rely. *See* Waisel Decl. ¶ 36; Ruble Decl. ¶ 32; Wikswow Decl. ¶ 7. As Dr. Waisel makes clear, "[a] thorough review of the protocol is an indispensable component of any assessment of the likelihood of severe pain. Without it, not only would I be unable to complete this assessment—I would not know where to begin." *See* Waisel Decl. ¶ 12. To Waisel, the protocol consists far more than of the drug combination and includes:

[P]reparation of lethal drugs and the responsible parties for preparing them; timing and technique of administration of the lethal injection drugs and flushes; available equipment including types of intravenous catheters; types of IV tubing; number of IVs to be inserted; locations of IVs, how they are to be assessed for patency (that they are open and running); and roles of the execution team members; process and equipment to rescue inmate given aborted or botched execution.

Id. Defendants' conduct renders Justice 360's professional speech rights "vain and futile" because inmates and their attorneys "cannot be expected to know how to protect their rights" without the benefit of expert analysis, *see Trainmen*, 377 U.S. at 5, 7, as a legal assessment of these rights requires highly specialized knowledge that attorneys do not possess. *See* Vann. Decl. ¶ 18; Wendel Decl. ¶¶ 13–15. In short, Defendants' position impinges Justice 360's ability to engage in

cooperative activity with experts, and thus suppresses Justice 360's ability to advise its clients and advocate for them in court. *St. John*, 1996 WL 49956, at *2. First Amendment rights "cannot be so handicapped." *Trainmen*, 377 U.S. at 7.

3. Defendants' conduct burdens Justice 360's ability to communicate with the court.

In addition to its First Amendment right to advise clients and consult experts, Justice 360 has an enforceable First Amendment right to litigate its clients' constitutional rights in court. *See, e.g., Primus*, 436 U.S. at 428; *Button*, 371 U.S. at 429; *Hutcheson*, 323 F.2d at 604. Indeed, the "First Amendment . . . protects vigorous advocacy, certainly of lawful ends, against governmental intrusion." *Button*, 371 U.S. at 429. The government may not take action that dampens this right by restricting an attorney's ability to "present all the reasonable and well-grounded arguments necessary for proper resolution of the case." *Velasquez*, 531 U.S. at 545; *see also State ex rel. Oklahoma Bar Ass'n v. Porter*, 766 P.2d 958, 967 (Okla. 1988).

In *Velasquez* the U.S. Supreme Court invalidated a restriction which forbade attorneys from challenging the constitutionality of existing welfare law. *Id.* at 549. The court explained that government may not "seek[] to prohibit the analysis of certain legal issues and to truncate presentation to the courts." *Id.* at 545. Such restrictions frustrate the purpose of the judiciary by (1) distorting the "traditional role of the attorneys," and (2) "prohibit[ing] speech and expression upon which courts must depend for the proper exercise of the judicial power." *Id.* at 544–45.

Here, the Identity Statute distorts Justice 360's "traditional role" because it prohibits Justice 360 from subjecting that protocol to meaningful adversarial testing and assisting the Court in making an informed decision as to its constitutionality. *Id.*; *see also Strickland v. Washington*, 466 U.S. 668, 688 (1984) ("Counsel [] has a duty to bring to bear such skill and knowledge as will render the trial a reliable adversarial testing process."). It is axiomatic that that Justice 360 cannot

fulfill this function if it is prohibited from learning what the execution method entails. *See* Vann Decl. ¶ 18. As Ms. Vann remarks, in conducting the inherently comparative Eighth Amendment analysis, she “cannot fulfill [her] ethical and legal duties” “[w]ithout information about how SCDC plans to carry out an execution via lethal injection or electrocution.” *Id.* ¶ 10. By depriving Justice 360 access to information that goes to the heart of its clients’ claims, Defendants impermissibly impede Justice 360’s First Amendment right to vindicate its clients’ constitutional protections in court. *See, e.g., Hutcheson*, 323 F.2d at 604.

In turn, Defendants’ conduct “prohibits speech and expression upon which courts must depend for the proper exercise of the judicial power” and is thus “inconsistent with accepted separation-of-powers principles.” *Velasquez*, 531 U.S. at 545–46. By depriving the court of the benefit of expert opinion and adversarial testing, the Defendants are attempting to “insulate [state policies] from constitutional scrutiny” and are thereby implicating “central First Amendment concerns.” *Id.* at 547. The First Amendment does not permit the government to shield its own actions from legitimate constitutional challenge and impair Justice 360’s ability to facilitate judicial oversight. *Id.* at 548; *see also Oklahoma Bar*, 766 P.2d at 967 (Okla. 1988) (“Foreclosing the right of an attorney to criticise the court is thus not only a burden on the speaker’s First Amendment right but also upon the public’s First Amendment right to hear what he has to say.”).

Justice 360’s professional speech must be informed and robust for litigation to be meaningful and fair. *See Velasquez*, 531 U.S. at 545. The adversarial system cannot function properly when the State stacks the evidentiary deck in favor of its own side. *See J.E.B. v. Alabama ex rel. T.B.*, 511 U.S. 127, 140 (1994). As the court observed in *Button*, litigation is often the only effective means of safeguarding the rights of unpopular causes and individuals, and burdens to mission-driven litigation thus raise “the gravest danger of smothering all discussion looking to the

eventual institution of litigation on behalf of the rights of members of an unpopular minority.” 371 U.S. at 434. Paradoxically, the state imposes a duty on the judiciary to independently and impartially evaluate the constitutionality of execution protocol, yet denies the court access to informed expert opinion or the benefit of meaningful adversarial testing to inform its decision. *Velasquez*, 531 U.S. at 545. Without precise and specific information, Defendants may intrude so far as to inhibit a judge from preventing a violation to an inmate’s Eighth Amendment rights by allowing a cruel and unusual, excessively painful execution. *See Hamm v. Dunn*, 2:17-cv-02083-KOB, 2018 WL 2431340, at *4 (N.D. Ala. May 30, 2018), *aff’d sub nom. Comm’r, Ala. Dep’t of Corr. v. Advance Local Media, LLC*, 918 F.3d 1161 (11th Cir. 2019). As in *Hamm*, an execution protocol is “central” to an as-applied challenge to a method of execution. *Id.* There, the court noted, “if Defendants had not agreed to voluntarily disclose it, the court would have ordered them to produce it; the court needed to review the protocol as much if not more than [the inmate] did.” *Id.* And although defendants offered to produce the protocol here for visual inspection to counsel for Mr. Moore, Vann Decl. ¶ 25, there was no room in the agreement to present it to the Court or to experts, as in *Hamm* where it was submitted to the Court. *Hamm*, 2018 WL 2431340, at *6 (“The court could not have analyzed the effect the condition of Mr. Hamm’s veins would have on his execution if the court did not know the details about how Mr. Hamm would be executed. Even if the court’s opinion lacked a detailed analysis of the interaction between the protocol and Mr. Hamm’s condition, the protocol was vital to resolving Defendants’ dispositive motion.”).

B. As-Applied to Justice 360, The Identity Statute Is Also An Impermissible Form of Content Discrimination and Viewpoint Discrimination

Justice 360 is also likely to prevail on the merits because Defendants’ refusal to supply the information Justice 360 requires to engage in professional speech constitutes impermissible content discrimination. *See NIFLA*, 138 S. Ct. at 2371–72. Government conduct that regulates

speech based on its content is presumptively invalid. *See, e.g., Reed v. Town of Gilbert, Ariz.*, 135 S. Ct. 2218 (2015). Here, Defendants’ position is content-based because it “cannot be justified without reference to the content of the regulated speech.” *Id.* (internal citation and quotation marks omitted); *see also Cahaly v. Larosa*, 796 F.3d 399, 405 (4th Cir. 2015). Specifically, Defendants have censored all speech that involves exercising meaningful oversight over Defendants’ execution process. Defendants have justified this conduct on the grounds that it must silence public and judicial critique of Defendants’ and its suppliers in order to ensure that it is able to efficiently carry out death-sentences. *See, e.g., Henry McMaster, Governor McMaster and SCDOC Director Stirling Discuss Lethal Injection Drug Shield Law*, YouTube (Nov. 20, 2017), <https://youtu.be/FONhXpwHMvU>. This justification explicitly refers to the *content* of the speech suppressed, as opposed to the time, place, or manner in which the topic is discussed. *See Reed*, 135 S. Ct. at 2226 (“[A] government . . . has no power to restrict expression because of its message, its ideas, its subject matter, or its content.”).

Establishing content discrimination does not require evidence of improper censorial motive, *Reed*, 135 S. Ct. at 2223, but here, Defendants’ conduct is particularly egregious in that they have embarked on a campaign to silence professional speech with which they *disagree*—*i.e.* valid criticisms of their practices by professionals seeking to vindicate the constitutional rights of a vulnerable group. *Id.*; *see also Hutcheson*, 323 F.2d 5 at 604 (“[The State may not] attempt[] to impede activity which [*Button*] has held to be constitutional protected.”). For example, South Carolina is one of fifteen death-penalty states that has joined an *amicus curia* brief in Nevada Supreme Court characterizing lawyers seeking to vindicate the constitutional rights of their clients as “guerillas” engaged in warfare against the death penalty who must be silenced. *See* Brief for States as Amicus Curiae, 2018 WL 4384242, at *7, *State v. Eighth Judicial Dist. Court in & for*

Cty. of Clark, 432 P.3d 758 (Nev. 2019). Specifically, the brief states, “if Alvogen is allowed to succeed, there is a substantial risk that pharmaceutical companies—prodded by anti-death penalty activists *and the defense bar*—will flood the courts with similar last-minute filings every time a State attempts to see justice done,” and “this latest front in the guerilla warfare being waged by antideath-penalty activists *and criminal defense attorneys* to stop lawful executions.” *Id.* at *7, *2 (emphasis added). In short, Defendants have shielded details of its execution protocols from judicial oversight in order to silence attorneys who seek to critique the government and its drug suppliers—a viewpoint with which it disagrees.

II. Justice 360 Will Suffer Irreparable Harm in the Absence of Preliminary Relief.

In the absence of preliminary relief, Justice 360 will suffer irreparable harm because SCDC will carry out executions without first releasing the information Justice 360 requires in order to counsel its clients and protect their constitutional rights, and, accordingly, Justice 360’s First Amendment professional speech rights will be violated. *See Newsom ex rel. Newsom v. Albemarle Cty. Sch. Bd.*, 354 F.3d 249, 254–55 (4th Cir. 2003) (noting that where a First Amendment violation is alleged, “[d]etermination of irreparable harm” and “analysis of [plaintiff’s] likelihood of success on the merits” are linked). The Fourth Circuit and the U.S. Supreme Court have made clear that “loss of First Amendment freedoms, for even minimal periods of time, unquestionably constitutes irreparable injury.” *Id.* at 261 (quoting *Elrod v. Burns*, 427 U.S. 347, 373 (1976)). In short, an injunction is warranted because allowing executions to proceed absent fulfillment of Justice 360’s professional speech rights will result in loss of First Amendment freedoms. *See id.*; *see also In re Murphy-Brown, LLC*, 907 F.3d 788, 801 (4th Cir. 2018) (“[A]ll First Amendment infringements . . . are ‘per se irreparable’ injuries”) (internal citation omitted).

Relatedly, allowing executions to proceed absent fulfillment of Justice 360’s professional speech rights could in turn result in loss of Eighth Amendment protections. The only meaningful time that Justice 360 can safeguard its clients’ Eighth Amendment rights is *before* they are executed—death is the ultimate irreparable harm. *See, e.g., Furman v. Georgia*, 408 U.S. 238, 286, 89 (1972) (Brennan, J., concurring) (“Death is a unique punishment”; “[d]eath . . . is in a class by itself”); *id.* at 306 (Stewart, J., concurring) (“[P]enalty of death differs from all other forms of criminal punishment, not in degree but in kind”). Courts have long recognized that the irrevocable finality of the death penalty necessitates proceeding with caution and vigilance in the administration of capital punishment. *See, e.g., Baze*, 553 U.S. at 84 (2008) (Stevens, J., concurring) (“[O]ur decisions rel[y] on the premise that ‘death is different’ from every other form of punishment to justify rules minimizing the risk of error in capitals cases.”) (internal citation omitted). As Justice Sotomayor explains, “[t]here are higher values than ensuring that executions run on time. If a death sentence or the manner in which it is carried out violates the Constitution, that stain can never come out. Our jurisprudence must remain one of vigilance and care, not one of dismissiveness.” *See Bucklew*, 139 S. Ct. at 1148 (Sotomayor, J., dissenting).

III. Preliminary Relief is Warranted Because the Balance of Equities Tips in Justice 360’s Favor.

Considering the balance of hardships between Justice 360 and Defendants, preliminary relief is warranted. None of Defendants’ justifications for burdening Justice 360’s First Amendment rights is persuasive, let alone narrowly tailored to serve a compelling government interest. *See, e.g., Button*, 371 U.S. at 438 (“[O]nly a compelling state interest in the regulation of a subject within the State’s constitutional power to regulate can justify limiting First Amendment freedoms.”); *see also Hutcheson*, 323 F.2d at 604 (“[T]he state must show an overriding and compelling interest before it is allowed to intrude upon constitutional rights.”).

First, Defendants’ speculative fears of harassment and retaliation are unsubstantiated and overblown. *See, e.g., California First Amendment Coal. v. Woodford*, 299 F.3d 868, 880 (9th Cir. 2002) ([D]efendants’ fear that execution team members will be publicly identified and retaliated against is an overreaction, supported only by questionable speculation”). As explained by the ABA Death Penalty Due Process Review Project’s report on ABA 108B, no threat has ever “been verified by any state seeking to shield information concerning execution drug suppliers from the public, either through prosecution, litigation, or other publically [sic] available evidence.” Report, *supra* note 6, at 12. Risk of stigma and retaliation are less compelling for private companies who willingly participate in the execution process and are not present in the execution chambers. *Id.*

And in any event, courts are well-suited to craft narrowly-tailored remedies that protect names and identifying information from entering the public record—such as by redacting the names and addresses of all individuals who would be involved in the execution—while allowing attorneys to meaningfully counsel their clients, consult experts, and advocate before the court. *See, e.g., Reed*, 135 S. Ct. at 2226 (burdens to First Amendment rights must be narrowly tailored). A blanket ban on discussion surrounding the state’s execution protocol is unduly burdensome, because Justice 360 is not seeking to frustrate the entire death penalty process; rather, Justice 360 is seeking to counsel its clients and subject execution protocols to meaningful adversarial testing in order to ensure that its clients are not subjected to inhumane executions. *See, e.g., Hamm*, 2018 WL 2431340, at *4 (unsealing lethal injection protocol and related court records); *Hamm v. Dunn*, 138 S. Ct. 828, 200 (2018) (carrying out execution after granting access to execution protocol). Encouraging Defendants to improve and refine its protocols does not eradicate the State’s ability to carry out lawfully imposed death sentences; it simply requires the State to design practices that comport with its constitutional obligation to not inflict cruel and unusual punishment. *Id.*

Obstructing Justice 360 and its expert witnesses' access to information central to the subject matter of litigation vastly and unnecessarily suppresses protected speech. *See Button*, 371 U.S. at 438. "Precision of regulation must be the touchstone in an area so closely touching our most precious freedoms." *Id.*

Second, it is well-established that protecting private entities from reputational and economic injury is not a cognizable state interest. *See, e.g., Doe v. Pub. Citizen*, 749 F.3d 246, 270 (4th Cir. 2014); *Procter & Gamble Co. v. Bankers Trust Co.*, 78 F.3d 219, 225 (6th Cir. 1996); *Republic of Philippines v. Westinghouse Elec. Corp.*, 949 F.2d 653, 663 (3d Cir. 1991); *Cent. Nat'l Bank of Mattoon v. U.S. Dep't of Treasury*, 912 F.2d 897, 900 (7th Cir. 1990); *Wilson v. Am. Motors Corp.*, 759 F.2d 1568, 1570–71 (11th Cir. 1985). As the ABA Death Penalty Due Process Review Project's report on ABA 108B observes, "the public's view of drugmakers' participation in executions—whether it be a detriment or even a boon to a business's reputation and bottom line—is part and parcel of the American economic system. It is difficult to imagine other scenarios in which a business's concerns about the public's response to their activities would lead U.S. elected officials to conceal that business's identity from the public." Report, *supra* note 6, at 12. And indeed there is no evidence that a supplier who might not actually be aware that South Carolina is using its drugs would not itself have a right to challenge an improper method of procurement; this might run afoul of strict regulations on drug procurement required in the execution context. *See Cook v. Food & Drug Admin.*, 733 F.3d 1, 4 (D.C. Cir. 2013).

Third, the stated nexus between secrecy and ability to carry out death sentences is speculative and a mere matter of administrative convenience, which does not rise to the level of compelling interest and not enough to outweigh Justice 360's right to obtain the information. *See, e.g., Beaumont v. Fed. Election Comm'n*, 278 F.3d 261, 274 (4th Cir. 2002) ("[A]dministrative

convenience . . . is insufficient to justify state action that triggers any level of heightened scrutiny”), *overruled on other grounds sub nom. Fed. Election Comm'n v. Beaumont*, 539 U.S. 146, 161–63, (2003) (also noting “the basic premise we have followed in setting First Amendment standards [that] the level of scrutiny is based on the importance of the ‘political activity at issue’ to effective speech or political association” and noting “the difference between a ban and a limit”). It is the State’s burden to demonstrate a nexus between secrecy and the ability to procure drugs, which is has not (and cannot) do. There are a multitude of reasons why pharmaceutical companies would not want to supply states with lethal injection drugs—namely, ethical concerns. In the absence of non-conclusory evidence that secrecy is necessary or even relevant to the procurement of lethal injection drugs, this State interest remains speculative and unconvincing.

Fourth, suppressing First Amendment freedom to protest is not a cognizable state interest. *See Schenck v. Pro Choice Network of Western New York*, 519 U.S. 357, 377 (1997). Like the floating buffer zones in *Schenck*, the Identity Statute prevents individuals from commenting on matters of public concern directly to the parties with which it is interested. *Id.*; *see also Saxbe v. Washington Post Co.*, 417 U.S. 843, 848 (1974) (upholding prison policy that was “not part of any attempt by the Federal Bureau of Prisons to conceal from the public the conditions prevailing in federal prisons.”). And finally, whatever interest the state has in secrecy can be avoided by narrowly construing it under the cannon of constitutional avoidance to ensure it does not prohibit disclosure of the necessary information, as explained *infra*.

IV. Preliminary Relief is in the Public Interest.

Finally, preliminary relief is warranted because “upholding constitutional rights is in the public interest.” *Legend Night Club v. Miller*, 637 F.3d 291, 303 (4th Cir. 2011). Likewise, transparency will help promote public confidence and respect in the fair, careful administration of

capital punishment and surrounding legal proceedings. As explained in a report submitted with ABA 108B to the American Bar Association’s House of Delegates by the organization’s Death Penalty Due Process Review Project, allowing states to shroud “irreversible and momentous state actions, like executions, in secrecy” violates “core values found in the First Amendment and risks eroding the public’s faith in the judicial system as a whole.”⁷ Indeed, transparency is necessary to deter government misconduct, prevent wrongdoing, and ensure humane executions; judicial presence enhances the integrity and quality of governmental processes, which is of particular importance in exercise of the death penalty due to its irrevocability and the current climate regarding lethal injection. *Id.* (“[P]rocedures that are created in secrecy and maintained without transparency are far more likely to be ill-conceived and poorly or inconsistently administered”).

CONCLUSION

For the foregoing reasons, this Court should grant Justice 360’s motion for a TRO and preliminary injunction, enjoining Defendants from carrying out executions until this case is resolved.

⁷Report, at 11, *Available* at <https://www.in.gov/ipdc/files/ABA%20Report%20-%20Execution%20protocol%20-108B.pdf>.

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RESPECTFULLY SUBMITTED

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**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA**

Justice 360,

Plaintiff,

v.

Bryan P. Stirling, Director of the South Carolina
Department of Corrections; and Alan Wilson,
South Carolina Attorney General,

Defendants.

Civil Action No. 3:20-03671-MGL

DECLARATION OF DAVID B. WAISEL

I, DAVID B. WAISEL, declare as follows:

1. My name is David B. Waisel, M.D. I am over eighteen years old and I am competent to give sworn testimony in a court of law. I am the Section Chief of Pediatric Anesthesiology and a Professor of Anesthesiology at the Yale School of Medicine. I base this declaration upon my personal knowledge and sources of the type relied upon by researchers and practitioners in the practice of anesthesiology and have included footnotes indicating the sources counsel provided to me for my review. I hold all opinions expressed in here to a reasonable degree of medical certainty. I am not being compensated for providing this Declaration. I make this declaration in my individual capacity, and my opinions should not be interpreted as the views of the institutions I am affiliated with, if any.

2. Based on my conversations with counsel and my review of the complaint, I understand that under South Carolina law inmates can elect to be executed by lethal injection or electrocution. I also understand based on these sources that the South Carolina Department of Corrections has indicated that it will use either a three-drug protocol of pentobarbital, pancuronium

bromide, and potassium chloride, or a single drug protocol of pentobarbital, but it has not disclosed other meaningful information about the state's lethal injection protocol, including but not limited to the drug's source, initial dosing and repeat dosing, timing, assessment of anesthetic depth, manner of administration, equipment availability and use, and backup plan. Without such basic details about South Carolina's lethal injection protocol, I cannot form an opinion regarding whether this protocol poses a substantial risk of severe pain to an inmate. This lack of information also prevents me from effectively conveying to any death penalty counsel, such as Justice 360, an assessment of the risk of severe pain posed by this protocol. Finally, the lack of information precludes me from consulting with other expert witnesses about whether other methods of execution, such as electrocution, pose a lower risk of severe pain than lethal injection.

3. The information I would need to form an expert opinion about whether South Carolina's lethal injection protocol poses a substantial risk of severe pain to an inmate would be, at a minimum, which lethal injection protocol the state is actually following, including meaningful details of the protocols, including but not limited to: the identity, dose, and timing of the chemical(s) in the lethal injection combination; the formulation of the chemicals; the qualifications of members of the execution team; the method of administration; and the equipment and layout of the lethal injection site.

4. I submit this report to the Court to explain that, if given the requested information, I would be able to develop an expert opinion as to the relative risk of severe pain presented by the lethal injection protocol in South Carolina. In this Declaration, I first describe why having the requested information is necessary for me to provide an expert opinion on whether there is a substantial risk that an inmate will suffer severe pain under the South Carolina lethal injection protocol. Next, I list what information I would specifically need in order to provide this expert

opinion. This list is divided into five sections: information about the (1) identity, dose, and timing of the chemicals used for the execution; (2) formulation of the chemicals; (3) qualifications of the execution-team members; (4) method of administration; and (5) equipment and layout of the lethal injection site. I then explain how I would use the requested information to assess whether an execution method poses a substantial risk of severe pain. I conclude that without this information, it impossible for me to advise Justice 360 or their clients as to the relative risks of pain associated with the state's lethal injection protocol. If I am unable to make any such determination of the risks associated with the state's protocol, I will be unable to counsel and assist Justice 360 or its clients regarding whether the state's lethal injection protocol poses a substantial risk of severe pain. I would also be unable to consult with other experts about whether other execution methods, such as electrocution, pose a lower risk of severe pain.

I. BACKGROUND AND QUALIFICATIONS

5. I am the Section Chief of Pediatric Anesthesiology and a Professor of Anesthesiology at the Yale School of Medicine. I practice pediatric anesthesiology full-time at the Yale New Haven Hospital, where I provide anesthesia for all ages of children from very healthy to very sick. I have been practicing within this specialty for almost 28 years and am licensed to practice medicine in Massachusetts and Connecticut.

6. I received my M.D. from the Medical College of Pennsylvania in 1989. I performed my anesthesiology residency at Wilford Hall Medical Center, Lackland Air Force Base. As part of my residency, I spent my 3rd year of anesthesia residency at Children's Hospital Boston, doing what was then considered a fellowship in pediatric anesthesiology. Following a second year at Children's Hospital Boston, in which I performed research and received training in medical ethics, I returned to Wilford Hall Medical Center for five years.

7. In 1999, I returned to Children’s Hospital Boston. During my time at the Children’s Hospital Boston, I practiced as a board-certified anesthesiologist. I also taught at Harvard Medical School, where I was an Associate Professor of Anesthesia until this past year, when I moved to Yale University in New Haven. I have received numerous teaching awards—two while I was at Wilford Hall Medical Center and one while I was teaching at Harvard Medical School.

8. I have substantial experience understanding the pain response and the pharmacology of pain management, including understanding how each individual patient responds to pain based on their unique medical history, lab results, substance use history, and other factors. I estimate that I have performed pre-operative assessments and administered or supervised anesthesia in well over 13,000 patients.

9. I am the author of over 90 articles and book chapters, focusing primarily on anesthesiology and medical ethics. These articles have been published in *Anesthesiology*, *The Mayo Clinic Proceedings*, and the *Lancet*, among others. A full list of my publications is included in the attached Curriculum Vitae. I have been invited to present on topics related to anesthesia and medical ethics both nationally and internationally, and regularly present at the Annual Meeting for the American Society of Anesthesiologists.

10. Because of my extensive experience in anesthesiology, I have been called upon to give expert medical opinions in a number of cases involving the use of lethal injection at both the federal and state level.

II. ASSESSING THE EXECUTION METHOD’S RISK OF SEVERE PAIN

A. The Information I Need to Assess Whether an Execution Method Poses a Substantial Risk of Severe Pain

11. If I do not have the requested information about South Carolina’s lethal injection protocol, it is impossible for me to provide expert assistance on whether that protocol poses a

substantial risk of severe pain to inmates. Without the requested information, I cannot evaluate whether the state's protocol is sound or likely to function as intended. Nor can I evaluate the corresponding likelihood that the protocol is faulty or likely to malfunction due to unintended deviations from the protocol. In turn, I cannot communicate any of this information to death penalty counsel who seek my expertise such as Justice 360. This means I would be unable to assist Justice 360 in providing important information to its clients or in formulating arguments to present to a court. It also means I would be unable to consult with other experts about whether other execution methods, such as electrocution, pose a lower risk of severe pain than lethal injection.

12. To assess whether there is a substantial risk that an inmate will suffer severe pain from an execution by lethal injection, I need to know, most basically, the lethal injection protocol, which in many jurisdictions includes preparation of lethal drugs and the responsible parties for preparing them; timing and technique of administration of the lethal injection drugs and flushes; available equipment including types of intravenous catheters; types of IV tubing; number of IVs to be inserted; locations of IVs, how they are to be assessed for patency (that they are open and running); and roles of the execution team members; process and equipment to rescue inmate given aborted or botched execution. A thorough review of the protocol is an indispensable component of any assessment of the likelihood of severe pain. Without it, not only would I be unable to complete this assessment—I would not know where to begin. Attempting to do so would be like trying to determine how many pins a bowler struck down in an alley located across town.

13. The lack of this basic information—as well as the information detailed below—makes it impossible for me to assess whether there is a substantial risk that an inmate will suffer severe pain during an execution by lethal injection in South Carolina; to communicate information

about this question to Justice 360; and to consult with other experts about whether execution by other methods, such as electrocution, poses a lesser risk of severe pain.

i. I Need Information About the Identity and Dose of the Chemicals Used in the Lethal Injection Protocol.

14. To assess whether there is a substantial risk that an inmate will suffer severe pain during an execution by lethal injection in South Carolina, I need to know the precise chemicals in the lethal injection combination and the doses in which they will be administered. The details of this drug combination can significantly affect the likelihood that the inmate will be subjected to a substantial risk of severe pain.

15. For example, one drug commonly used in executions by lethal injection is pentobarbital. Pentobarbital has been typically used in the oral form as a sedative or for short-term treatment of insomnia and in the intravenous form as an anticonvulsant. Because pentobarbital is rarely used in the operating room, there is no relevant clinical history or reference doses on which to determine what dose would cause a clinically adequate depth of anesthesia and at what dose clinical side effects may occur. Only when a drug has been tested systematically can we begin to reliably assess how it will affect human subjects. That data is not available for pentobarbital. It is therefore unknown in any given case how a particular dose will affect an inmate and whether it increases the risk that the inmate will face a substantial risk of severe pain in the execution chamber.

16. Unless I know which of these drugs will be used in an execution and in what doses, I cannot reliably assess whether the inmate is at a substantial risk of severe pain due to scenarios such as precipitation, where chemicals combine in solution to form solids such as crystals that are not always visible to the naked eye. If the chemical combination is improper, chemicals can react to form small solid particles, which can be excruciatingly painful upon injection.

17. Another possible outcome of supraphysiologic dosing is a heightened risk of flash pulmonary edema during the execution process, which could certainly cause severe pain if suffered while the inmate is conscious.¹ Pulmonary edema is a condition characterized by heavy lungs resulting from excessive fluid. An inmate suffering from pulmonary edema will often experience “air hunger”: the inability to take a breath to satisfy the ventilatory drive we all have. Simple examples are the feelings you get when the air is knocked out of you, or when at the swimming pool a friend holds your head down underwater. While these experiences can be scary, and the sensation of breathing is met with palpable relief, yet in normal contexts, the individual nonetheless believes they will be able to breathe again. This knowledge ameliorates the experience of air hunger, but it is not present when a person is being executed, and if the inmate is conscious could result in an excruciatingly painful experience.

ii. I Need Information About the Formulation of the Chemicals Used in the Lethal Injection Protocol.

18. It is also impossible for me to assess whether there is a substantial risk that an inmate will suffer severe pain during an execution by lethal injection in South Carolina without knowing information about the formulation of the drugs in the lethal injection combination. This includes information about their purity, potency, pH, and concentration. Potency is a measure of drug activity expressed in terms of the amount (concentration) of properly prepared drug in a biological area (e.g., blood) that is required to cause a particular effect of given intensity. If a subpotent dose of a drug is administered to an inmate either because the drug was expired or not prepared properly (for example, by a compounding pharmacy), the drug will not have its intended effect absent additional doses. But having to inject additional doses of a subpotent drug can

¹ Noah Caldwell, Ailsa Chang, & Jolie Myers, *Gasping for Air: Autopsies Reveal Troubling Effects of Lethal Injection*, NPR (Sept. 21, 2020), <https://www.npr.org/2020/09/21/793177589/gasping-for-air-autopsies-reveal-troubling-effects-of-lethal-injection>.

increase the risk of a prolonged execution, and in turn, substantially increase the risk of severe pain.

19. Consider what happened during Joseph Wood's execution in Arizona. Wood was injected with doses of midazolam and hydromorphone fifteen times greater than the doses prescribed in the state's lethal injection protocol.² Wood was observed "gasping and gulping" for more than an hour, with one witness describing how he "gulped like a fish on land."³ Wood was estimated to have opened his mouth more than 640 times during the nearly two hours it took him to die.⁴ Based on this information, it is my opinion that to a reasonable degree of medical certainty, it is likely that Wood suffered extreme pain during his execution.

iii. I Need Information About the Qualifications of the Execution-Team Members.

20. To assess whether there is a substantial risk that an inmate will suffer severe pain during an execution by lethal injection in South Carolina, I need information about the qualifications of the members of the execution team. Relevant information for assessing whether an individual is qualified to perform the execution as intended includes, but is not limited to, the individual's education level, experience in obtaining intravenous access, and whether they have the appropriate medical certifications. In my supervisory role as an anesthesiologist, determining whether a team member is qualified is essential for mitigating risks and for ensuring the safety of

² See Tom Dart, *Arizona inmate Joseph Wood was injected 15 times with execution drugs*, Guardian (Aug. 2 2014), <https://www.theguardian.com/world/2014/aug/02/arizona-inmate-injected-15-times-execution-drugs-joseph-wood>.

³ Ed Pilkington, *Joseph Wood: Arizona Murderer Dies Almost Two Hours After Execution Begins*, Guardian (July 24, 2014), <https://www.theguardian.com/world/2014/jul/23/arizona-killer-still-alive-an-hour-after-execution-begins>; Michael Kiefer, *Reporter Describes Arizona Execution: 2 hours, 640 gasps*, Arizona Republic (updated Nov. 6, 2014), <https://www.azcentral.com/story/news/arizona/politics/2014/07/24/arizona-execution-joseph-wood-eyewitness/13083637/>.

⁴ Michael Kiefer, *Reporter Describes Arizona Execution: 2 hours, 640 gasps*, Arizona Republic (updated Nov. 6, 2014), <https://www.azcentral.com/story/news/arizona/politics/2014/07/24/arizona-execution-joseph-wood-eyewitness/13083637/>.

patients, as well as for guaranteeing that the administration of the anesthetic is carried out as intended. Similarly, in the lethal injection context, qualifications are very important because execution team members who are more qualified are more likely to carry out the lethal injection as intended and avoid errors that could cause the inmate to suffer severe pain.

21. Given that South Carolina's last execution by lethal injection occurred in 2011,⁵ many of the personnel on South Carolina's execution team likely would be new or inexperienced. And these personnel likely would be tasked with administering a lethal injection combination the state has never used before. This means South Carolina would be essentially back to square one and operating as if it were conducting its very first execution by lethal injection.

22. The use of an inexperienced team working with new chemicals and without sufficient practice is directly at odds with my personal experience as a practicing anesthesiologist. Behind any administration of anesthesia, there are many steps I take to avoid risks and to ensure the safety of each patient. First, it is imperative that individuals who are part of my administering team have amassed the proper credentials for administering anesthesia. This includes, among other things, graduation from medical school, medical residency assessment and completion, and board certification. Additionally, separate and apart from my own supervision of team members, certain hospital procedures and practices ensure that we are conducting our jobs as safely as possible. For example, in determining whether an individual has the proper experience and reliability necessary for conducting an operation in their specialty, we often consider both the number of cases that person has completed and the outcome of those cases. Although the timing varies by location, these individuals have to be re-credentialed every few years to ensure that each practitioner is qualified to do their job as safely as possible.

⁵ *Death Row/Capital Punishment*, South Carolina Department of Corrections (chart information updated Mar. 2020), <http://www.doc.sc.gov/news/deathrow.html>.

23. More generally, infrequent practice and insufficient experience can lead to poor performance among teams. In the health care context, there is a strong link between teamwork failures such as communication or coordination errors and preventable harm to patients in the U.S. healthcare system, as well as the quality of care provided to those patients.⁶ Based on my nearly 28 years either working in or overseeing teams as a practicing anesthesiologist, I can speak firsthand to the value of building positive team environments in which each member feels empowered to point out errors and the entire team operates with the confidence that everyone is on the same page. Developing this kind of team dynamic takes time and repetition. There is no exception for members of a team carrying out an execution, which is a multi-step process requiring precise coordination and entailing many potential pitfalls that must be identified and called out to be avoided. Accordingly, a lack of experience and practice for South Carolina's lethal injection team could increase the risk of the inmate suffering severe pain.

24. But even with an experienced and credentialed execution team in place, there is no guarantee that the inmate will *not* face a substantial risk of severe pain. One notable example is Clayton Lockett's botched execution in Oklahoma.⁷ An independent investigation of Lockett's execution described how one of the two execution team members handling the IV insertion process was a paramedic who had been licensed for over four decades in emergency medical services and estimated being involved in all but two of Oklahoma's lethal injection executions.⁸ The other execution team member in charge of IV insertion was a licensed medical doctor who practiced emergency medicine with a certification in family medicine.⁹ It is not at all clear, however, that

⁶ Michael A. Rosen et al., *Teamwork in Healthcare: Key Discoveries Enabling Safer, High-Quality Care*, 73(4) *Am. Psychologist* 433–50 (2018).

⁷ See *The Execution of Clayton D. Lockett*, Oklahoma Department of Public Safety, <https://files.deathpenaltyinfo.org/legacy/documents/LockettInvestigationReport.pdf>.

⁸ *Id.* at 15.

⁹ *Id.*

either the paramedic or physician was qualified to properly administer an IV into the femoral vein for an execution by lethal injection. The lack of sufficient qualifications for Lockett's execution team may well have contributed to an improper IV administration, which is described in more detail below.

iv. I Need Information About the Method of Administration

25. To assess whether there is a substantial risk that an inmate will suffer severe pain during an execution by lethal injection in South Carolina, I would need information about the precise method of administration called for by the state's lethal injection protocol. Critical details include how many IV lines would be connected to the inmate; where those lines would be connected; how those lines are kept open; how much flush is being used; and how well the drip chambers can be observed.

26. Lockett's botched execution demonstrates the importance of proper IV administration in executions by lethal injection. The paramedic and physician carrying out Lockett's execution made multiple attempts at IV access before attempting to insert an IV into the femoral vein in Lockett's right groin area.¹⁰ After Lockett's body was covered with a sheet, which shrouded the IV insertion site, the IV catheter presumably dislodged (if it was ever in the femoral vein), the IV infiltrated (i.e., seeped fluid into the tissues surrounding the vein instead of being inside the vein where it should have been). At this point, a "clear liquid and blood" was observed on the skin around Lockett's groin, and a swollen area beneath Lockett's skin emerged that was described as "smaller than a tennis ball, but larger than a golf ball."¹¹ Nearly an hour and forty-five minutes elapsed between when Lockett was strapped down on the execution table and

¹⁰ *Id.* at 15–19.

¹¹ *Id.* at 17–19.

pronounced dead.¹² An autopsy of Lockett showed signs of elevated midazolam concentrations in tissue close to the insertion point in Lockett's right groin area.¹³ An independent investigation of Lockett's execution concluded that the "single greatest factor" contributing to the "difficulty in administ[rati]on]" of the lethal injection drugs was the "viability of the IV access point[.]"¹⁴

27. Another important component of my assessment of the likelihood of severe pain would be determining whether the execution method allows for clinical feedback in real time. Whenever I administer anesthesia to a patient, I seek to increase feedback by facilitating real-time information flow. For example, when obtaining both peripheral and central intravenous (IV) access, it is important that I am able to continuously monitor how my patients are reacting to my actions and movements, which allows me to adjust my decisions accordingly. Likewise, it is critical that execution team members are able to closely observe the movements and facial expressions of inmates throughout the execution; both can provide strong indicators that the inmate is suffering severe pain.

28. To assess whether there is a substantial risk of severe pain, I also would need information about the backup plan for the lethal injection protocol were an error to occur at any phase of the execution. Such a plan should cover scenarios such as an improper administration of the IV and an unexpectedly ineffective chemical formula. A thorough lethal injection protocol would account for contingencies by going through each of the medical steps that would be taken and include branch points covering a variety of possible outcomes, challenges, and missteps. For example, the protocol could state: "if the inmate remains conscious following the administration of the anesthetic, move to paragraph 3." If the protocol does not account for the many errors that

¹² *Id.* at 10–12.

¹³ *Id.* at 19.

¹⁴ *Id.* at 14.

could occur during the execution, there is a substantial risk that the inmate will be subjected to severe pain due to the execution team acting without sufficient planning or foresight.

v. I Need Information About the Equipment and Layout of the Lethal Injection Site.

29. To assess whether there is a substantial risk that an inmate will suffer severe pain during an execution by lethal injection in South Carolina, I would need to closely examine South Carolina's execution facilities. If given such access to the execution facilities, I would seek to understand the layout of the lethal injection site, whether the lighting is adequate, the spatial relationship between the injectors and the inmate, and whether the injectors' vision of the inmate or IV equipment would be impeded in any way. The following example illustrates why this information is important to my assessment: if the injectors cannot see whether chemicals are leaking or parts of the inmate's body are swelling, they would not have any reason to intervene while the inmate is potentially suffering severe pain.

30. One such source of potential errors is an execution-chamber set-up counterproductive to the intended functioning of the lethal injection protocol. Knowing the set-up of the execution chamber would aid my assessment of the likelihood of severe pain in several respects. It would allow me to predict the likelihood that an execution team member will identify an improperly administered IV. It would allow me to get a sense for whether an execution team member will notice any equipment malfunctions. It would allow me to understand the line of sight execution team members will have into the IV drip chamber. There are other potential benefits. But not even those noted here are feasible unless I have detailed information about how the execution chamber will be set up on the execution date. The lack of this information is thus a major obstacle to my assessing the likelihood of severe pain.

31. To form an opinion about the likelihood of severe pain, I would also need detailed information about the equipment to be used in the execution. One important example is ultrasound technology. An ultrasound machine is an important tool that helps facilitate proper IV administration by aiding the detection of viable IV insertion points and by confirming that the IV catheter is in the vein. In my experience both administering IVs and overseeing the administration of IVs, ultrasound machines are very helpful in obtaining IV access efficiently and effectively.

32. Lack of access to an ultrasound machine¹⁵ likely played a role in the flawed IV administration for Lockett's botched execution. The use of an ultrasound machine by clinicians experienced in ultrasound may well have alerted the execution team to problems during the multiple attempts at IV access.¹⁶ Another equipment failure in Lockett's execution related to the catheter and needle. The physician ultimately used a needle and catheter of $1\frac{1}{4}$ inches for access into Lockett's right femoral vein after requesting a longer needle and catheter; the paramedic and physician agreed they would have preferred a needle and catheter between $1\frac{3}{4}$ and $2\frac{1}{2}$ inches.¹⁷ As in Lockett's execution, the lack of capable and up-to-date equipment can heighten the risk that an inmate faces a substantial risk of severe pain.

B. How I Would Use the Requested Information to Assess Whether an Execution Method Poses a Substantial Risk of Severe Pain.

33. If given the information Justice 360 has requested from the South Carolina Department of Corrections about the state's lethal injection protocol, I would be able to draw on my decades of experience in anesthesiology to form an opinion as to whether an inmate faces a substantial risk of severe pain. Moreover, I could help advise Justice 360 and its clients on the

¹⁵ *Id.* at 16.

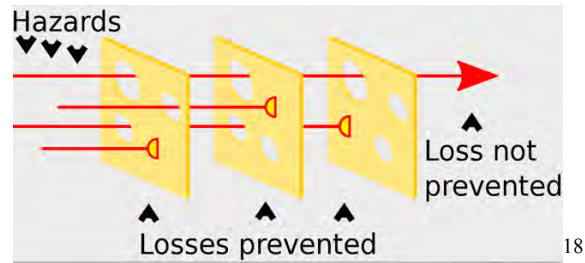
¹⁶ *Id.* at 15–19.

¹⁷ *Id.* at 16.

various risks associated with lethal injection and help Justice 360 present a case to a court—and its clients—about these risks and whether lethal injection would carry a substantial risk of severe pain. In addition, access to the requested information would allow me to consult with other experts about whether other methods of execution, such as electrocution, pose a lesser risk of severe pain.

34. My conclusion about whether there is a substantial risk of severe pain for an inmate would be couched in terms of risk: if provided the requested information, I would closely review all of it to determine how likely it is that the inmate will suffer severe pain and the potential sources of the pain and the sensory experience of the inmate. My conclusion would be based on an evaluation of the potential errors at different stages of the execution process.

35. That said, access to only one or two pieces of information about the lethal injection protocol, such as the execution-chamber set-up, would not be sufficient for me to form an opinion as to the likelihood of an inmate suffering severe pain. This is because in any medical procedure the combined effect of several deficiencies in various aspects of the entire procedure is a substantially increased overall risk of error and harm. The concept is most easily understood with an analogy to a slice of swiss cheese, with each hole being an error. Any one error, or hole, may cause major harm, but more commonly multiple small errors occur, or, in this example, multiple holes, line up to cause major error and subsequent harm. The lower the likelihood of *each error, or hole, occurring*, the lower the likelihood of the holes lining up to cause a breakdown *at all*. In other words, multiple seemingly harmless errors very easily line up to cause a major error, as displayed by the following chart.



Consider an execution by lethal injection that involves an unknown chemical formula, an inexperienced execution team, and poor visibility into the IV drip chamber. It is certainly possible that none of these vulnerabilities, standing on their own, would pose a substantial risk of severe pain to the inmate. But such a risk may well exist due to the combined risk posed by each vulnerability.

V. CONCLUSION

36. If I am not provided with the information Justice 360 has requested about South Carolina’s lethal injection protocol, it is impossible for me to provide an expert opinion about whether an inmate is at a substantial risk of suffering severe pain—from the use of chemically incompatible drugs in the lethal injection formula, improper IV administration, unqualified execution-team members, or any other source. In turn, I would be unable to advise Justice 360, regarding this question, on the information it provides to its clients as part of its lawyer-client relationship as well as the information it presents in arguments to a court. Further, the lack of this information would prevent me from consulting with other experts.

¹⁸ This image is adapted by Ben Aveling from the following article on minor errors compounding. James Reason, *Human error: models and management*, 320 *BMJ* 768, Fig. 1 (2000), as explained under a creative commons license on the following website: https://commons.wikimedia.org/wiki/File:Swiss_cheese_model.svg (last visited Nov. 1, 2020).

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

Executed on November 24, 2020 in New Haven, CT.

A handwritten signature in black ink, appearing to read "David B. Waisel".

David B. Waisel

David B. Waisel, M.D.

CURRICULUM VITAE

Date of Revision: October 27, 2020

Name: David B. Waisel, MD

Proposed for Appointment: Professor, Department of Anesthesiology, Clinician Educator Track

Term: On a continuing basis beginning September 1, 2020

School: Yale University School of Medicine

Reason for Appointment:

Education:

- 1987 B.A. Lehigh University (Pre-medicine, 7 year medical program) 1987
- 1989 M.D. Medical College of Pennsylvania (MD and Humanities Scholar)

Career/Academic Appointments:

- 1989-1990 Intern, Internal Medicine, Wilford Hall Medical Center, Lackland Air Force Base, TX
- 1990-1992 Resident, Anesthesiology, Wilford Hall Medical Center, Lackland Air Force Base, TX
- 1992-1993 Senior Resident and Clinical Fellow, Pediatric Anesthesiology, Children’s Hospital Boston, Harvard Medical School, Boston, MA
- 1993-1994 Assistant in Anesthesia and Research Fellow, Pediatric Anesthesiology, Children’s Hospital Boston, Harvard Medical School, Boston, MA
- 1993-1994 Fellow in Medical Ethics, Harvard Medical School, Boston, MA
- 1994-1999 Attending, Department of Anesthesiology, Wilford Hall Medical Center, Lackland Air Force, TX
- 1999-2006 Assistant Professor of Anaesthesia, Harvard Medical School, Boston, MA
- 2006-2020 Associate Professor of Anaesthesia, Harvard Medical School, Boston, MA
- 2020- Professor of Anesthesiology, Yale School of Medicine, New Haven, CT

Administrative Positions:

- 1995-1998 Chief, Pediatric Anesthesiology, Department of Anesthesiology, Wilford Hall Medical Center, Lackland Air Force, TX
- 1998-1999 Director, Office of Medical Ethics, Wilford Hall Medical Center, Lackland Air Force, TX
- 2000-2011 Chair, Fellow Selection Committee, Department of Anesthesiology, Critical Care and Pain Medicine, Boston Children’s Hospital, Harvard Medical School, Boston, MA
- 2003-2013 Program Director, Pediatric Anesthesiology Fellowship, Department of Anesthesiology, Critical Care and Pain Medicine, Boston Children’s Hospital, Harvard Medical School, Boston, MA

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- 2006-2012 Chair, Education Committee, Program for Patient Safety and Quality, Boston Children's Hospital, Harvard Medical School, Boston, MA
- 2007-2009 Founder and President, Pediatric Anesthesiology Program Director's Organization
- 2014-2020 Program Director, Pediatric Regional Anesthesiology Fellowship, Department of Anesthesiology, Critical Care and Pain Medicine, Boston Children's Hospital, Harvard Medical School, Boston, MA
- 2020- Chief, Section of Pediatric Anesthesiology, Department of Anesthesiology, Yale School of Medicine, New Haven, CT

Board Certification:

- American Board of Anesthesiology, Anesthesiology Initial certification 1994 (indefinite); 2015 (Voluntary recertification)
- American Board of Anesthesiology, Pediatric Anesthesiology, 2013

Professional Honors & Recognition:**National**

- 2017 David M. Little Prize for Edwards ML, **Waisel DB**. 49 Mathoura Road: Geoffrey Kaye's center of excellence for the Australian Society of Anaesthetists. *Anesthesiology*. 2016;124:122-129. Anesthesia History Association. For the best work of anesthesia history published in the previous year in English.
- 2016 Special Award for Founding the Journal of Anesthesia History. Anesthesia History Association. Founding Editor-in-Chief of the *Journal of Anesthesia History*.
- 2009 Selected by *Anesthesiology* as one of the twelve 2009 articles that exemplified the mission of *Anesthesiology*. **Waisel DB**, Lamiani G, Sandroc N, Pascucci R, Truog RD, Meyer EC. *Anesthesiology trainees face ethical, practical and relational challenges in obtaining informed consent*. *Anesthesiology* 2009;110:480-4866.
- 2004 Honorable Mention for David M. Little Prize for **Waisel DB**. Norman's War: Norman B. Kornfield, MD, World War II physician-anesthetist. *Anesthesiology* 2003;98:995-1003. Anesthesia History Association. For the best work of anesthesia history published in the previous year in English.
- 2002 David M. Little Prize for **Waisel DB**. The role of World War II and the European Theatre of Operations in the development of anesthesiology as a physician specialty in the USA. *Anesthesiology* 2001;94:907-914. Anesthesia History Association. For the best work of anesthesia history published in the previous year in English.
- 1994 Wood Library-Museum of Anesthesiology Fellowship, Wood Library-Museum of Anesthesiology. Fellowship to provide support to study history at the Wood Library-Museum of Anesthesiology.

University

- 2007 Excellence in Tutoring Award, Harvard Medical School
For excellence in tutoring for Patient – Doctor III (meet with MS3 1x/week for 4 MS3 year (8 months)

David B. Waisel, M.D.

Local

- 1995 Golden Apple Award, Department of Anesthesiology, Wilford Hall Medical Center
For outstanding teacher of the year
- 1994 Golden Apple Award, Department of Anesthesiology, Wilford Hall Medical Center
For outstanding teacher of the year

Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated With Yale:**International**

- 2020 Development of anesthesiology as a medical profession in India. RACE. Chennai, India. January 25, 2020.
- 2019 Pediatric airway management and regional anesthesia. Modern Innovation in Pediatric Surgery and Anesthesia. UlaanBattor, Mongolia. October 9-10, 2019.
- 2016 What an editor wants. 16th WFSA World Congress Anesthesiologists, Hong Kong. August 30, 2016.
- 2015 Pediatric regional anesthesia. WFSA Honduras Lecture Series. Tegucigalpa, Honduras. April 10, 2015.
- 2015 Medical publishing in Cuba: a people-to-people exchange with MEDICC Havana, Cuba. February 19, 2015.
- 2013 Informed consent. 20th Panhellenic Congress of Anesthesia, Athens, Greece. April 26, 2013.
- 2013 DNR in the Operating Room. 20th Panhellenic Congress of Anesthesia, Athens, Greece. April 26, 2013.
- 2013 Regional anesthesia and war. 15th WFSA World Congress Anesthesiologists, Buenos Aires, Argentina. March 27, 2012.
- 2012 Ethics of organ transplantation. 58th Annual Meeting of the Japanese Society of Anesthesiologists. May 20, 2011.
- 2008 Plenary Symposium. The future of anesthesia practice. Annual Meeting of the Canadian Anesthesiologists' Society, Halifax, Canada. June 14, 2008.
- 1999 Physician aid-in-dying. Austrian International Congress 1999. Anaesthesia and Intensive Care. Vienna, Austria. September 30, 1999.

National

- 2019 Capital case defense seminar: Lethal injection. California Attorneys for Criminal Justice Monterey, CA. February 15, 2019.
- 2019 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. Orlando, FL October 21, 2019.
- 2018 Moderator: Is That Even Ethical? Addressing Challenges in Your Anesthesia Practice. SPA-AAP Pediatric Anesthesiology. Phoenix, AZ. March 23, 2018.
- 2018 Medical aspects of lethal injection. Federal Public Defenders, Capital Habeas Unit,

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- Los Angeles, CA. May 1, 2018.
- 2017 Compassion. Visiting Professor. University of Mississippi. Oxford, Mississippi. November 15, 2017.
- 2017 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. Boston, MA. October 23, 2017.
- 2016 The report of the public inquiry into children's heart surgery at the Bristol Royal Infirmary 1984-1995. Learning from history. American Society of Anesthesiologists Annual Meeting. Chicago, IL. October 23, 2016.
- 2016 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. Chicago, IL. October 24, 2016.
- 2015 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. San Diego, CA. October 26, 2015.
- 2014 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. New Orleans, LA. October 13, 2014.
- 2013 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. San Francisco, CA. October 14, 2013.
- 2013 Keynote speaker. Norman Kornfield and his relevance to modern day military medicine. Uniformed Services Society of Anesthesiologists Dining Out. San Francisco, CA. October 13, 2013.
- 2012 Why you should care about lethal injection? Visiting Professor. Medical Ethics. Department of Anesthesiology and Perioperative Medicine, University of Missouri School of Medicine. May 22, 2012.
- 2012 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. Washington, DC. October 14, 2012.
- 2011 Moderator: The WLM Patrick Sim Forum on the History of Anesthesiology American Society of Anesthesiologists Annual Meeting. Chicago, IL. October 17, 2011
- 2010 Ethical dilemmas with health care reform. Panel on Ethics, American Society of Anesthesiologists Annual Meeting. San Diego, CA. October 18, 2010.
- 2010 Moderator and participant: Should physicians be permitted to participate in lethal injection. Panel on Professionalism: American Society of Anesthesiologists Annual Meeting. San Diego, CA. October 19, 2010.
- 2010 When is a kid an adult? – Ethics of assent and consent for adolescent regional anesthesia. Panel on Pediatric Anesthesia, American Society of Anesthesiologists Annual Meeting. San Diego, CA. October 19, 2010.
- 2010 Bedside medical ethics during natural disasters. Visiting Professor. Arkansas Children's Hospital, University of Arkansas. Little Rock, AR. August 30, 2010.
- 2010 Physician participation in capital punishment. Ogden Surgical Medical Society. Ogden, Utah, May 14, 2010.
- 2009 Oh my God, she's pregnant! SPA/AAP Breakfast Panel. New Orleans, LA. October 16, 2009.

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- 2009 Donation after cardiac death. ASA Forum on Ethics. American Society of Anesthesiologists Annual Meeting. New Orleans, LA. October 19, 2009.
- 2008 Visiting Professor. Proposal for format for pediatric anesthesiology department. Department of Anesthesia, University of Iowa. Iowa City, IA. March 18, 2008.
- 2008 Primer in ethics. Society of Pediatric Anesthesia 22nd Annual Meeting. Orlando, FL. October 17, 2008.
- 2008 Putting it all together: A curriculum. Wood Library -Museum of Anesthesiology Forum on the History of Medicine. American Society of Anesthesiologists Annual Meeting. Orlando, FL. October 20, 2008.
- 2008 John Snow: Pump handles and infectious disease. American Society of Anesthesiologists Annual Meeting. Orlando, FL. October 21, 2008.
- 2008 World War Two: The crucible of “modern” anesthesiology. Roderick K. Calverley, M.D., Memorial Lecture. Anesthesia History Association. Orlando, FL. October 21, 2008.
- 2007 PERCS - Simulation for informed consent. Department of Anesthesia and Critical Care, Massachusetts General Hospital. February 14, 2007.
- 2007 Clinical Forum on Ethics. American Society of Anesthesiologists Annual Meeting. San Francisco, CA. October 16, 2007.
- 2007 What if Lord Nuffield had not found a Chair of Anesthesia? American Society of Anesthesiologists Annual Meeting. October 16, 2007.
- 2006 Lethal Injection. American Society of Anesthesiologists Annual Meeting. Chicago, IL. October 17, 2006.
- 2006 Visiting Professor. Physician participation in capital punishment. Department of Anesthesiology and Perioperative Medicine, Mayo Clinic, Rochester, MN. February 8, 2006.
- 2006 Lethal Injection. American Society of Anesthesiologists Annual Meeting. Chicago, IL. October 17, 2006.
- 2004 Social capital. New York Presbyterian Hospital and Weill Medical College at Cornell. New York City, NY. March 3, 2004.
- 2004 Ethical aspects of refusing transfusion therapy in minors. Practical Aspects of Pediatric Anesthesia, Boston, MA. May 1, 2004.
- 2003 Obstetric anesthesia and analgesia before 1950. American Society of Anesthesiologists Annual Meeting. San Francisco, CA. October 14, 2003.
- 2003 Plenary Session: Lt. Kornfield, World War II physician-anesthetist: why his story matters. Anesthesia History Association 10th Annual Spring Meeting. Boston, MA. May 1, 2003.
- 2003 Role of World War II in the development of anesthesiology as a medical profession. Anesthesia History Association 10th Annual Spring Meeting. May 2, 2003.
- 2003 The uncivil and unprofessional physician. American Society of Anesthesiologists Annual Meeting. San Francisco, CA. October 13, 2003.
- 2003 Perioperative DNR orders. American Society of Anesthesiologists Annual Meeting. San Francisco, CA. October 13, 2003.
- 2002 The centrality of civility to professionalism. American Society of Anesthesiologists Annual Meeting. Orlando, FL. October 14, 2002.
- 2001 Are we prepared for nuclear war? American Society of Anesthesiologists Annual Meeting. New Orleans, LA. October 15, 2001.

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- 2000 Perioperative refusal of resuscitation. New York Presbyterian Hospital and Weill Medical College at Cornell. New York City, NY. November 14, 2000.
- 2000 Clinical Forum on Ethics. American Society of Anesthesiologists Annual Meeting. San Francisco, CA. October 17, 2000.
- 2000 The business of anesthesiology is not just business. Utah Society of Anesthesiologists Winter Meeting. February 25, 2000.
- 1999 Ethical rules for humanitarian missions. Society of Air Force Clinical Surgeons 46th Annual Meeting. San Antonio, TX. June 3, 1999.
- 1999 Ethical considerations in pediatric trauma. TraumaCare '99 Symposium International Trauma Anesthesia and Critical Care Society. Chicago, IL. May 24, 1999.
- 1999 Conflict and communication with patients. American Society of Anesthesiologists Annual Meeting. Dallas, TX. October 11, 1999.
- 1998 Social capital. Department of Anesthesiology, Rush-Presbyterian-St. Luke's Medical Center. September 24, 1998.
- 1998 Ethical challenges for the practice of anesthesiology. Kentucky Society of Anesthesiologists Spring Meeting. April 11, 1998.
- 1998 Panel on military anesthesia Society of Air Force Clinical Surgeons 45th Annual Meeting. San Antonio, TX. June 5, 1998.
- 1998 The importance of modeling. Society of Air Force Clinical Surgeons 45th Annual Meeting. San Antonio, TX. June 5, 1998.
- 1998 Grand Rounds. The business of anesthesiology is not just business: obligations to the patient and anesthesiology communities. Department of Anesthesiology and Critical Care, Children's Hospital of Philadelphia, University of Pennsylvania. May 8, 1998.
- 1998 Ethics in education. Innovation and challenges in anesthesiology education. Society for Education in Anesthesia, Fall Meeting. Orlando, FL. October 16, 1998.
- 1998 Clinical Forum on Ethics. American Society of Anesthesiologists Annual Meeting. Orlando, FL. October 19, 1998.
- 1997 Can ethics be taught? American Society of Anesthesiologists Annual Meeting. San Diego, CA. October 21, 1997.
- 1997 A model curriculum for teaching bioethics. American Society of Anesthesiologists Annual Meeting. San Diego, CA. October 21, 1997.
- 1997 Ethical issues in the operating room. Second Annual Practice Management Conference for Anesthesiology Residents and Fellows: Getting Ready for the Real World, Chicago, IL. May 10, 1997.
- 1997 What bioethics can do for you? Workshop on Practical Bioethics for the Anesthesiologist. American Society of Anesthesiologists. Boston, MA. July 11, 1997/
- 1996 Should the HIV-infected anesthesiologist tell his or her patient? American Society of Anesthesiologists Annual Meeting. New Orleans, LA. October 12, 1996.
- 1995 The role of the anesthesiologist in physician-assisted death. American Society of Anesthesiologists Annual Meeting. Atlanta, GA. October 24, 1995.

Regional

- 2015 Graduation Speech, University of Connecticut Anesthesiology Residency Program.
- 2013 Invited Combined Operating Room Grand Rounds (nursing, surgery, anesthesiology): Social Capital. Boston Medical Center

David B. Waisel, M.D.

- 2010 Invited speaker. Grand Round: PERCS. Anesthesia, Critical Care and Pain Medicine, Beth Israel Deaconess Medical Center
- 2010 The development of anesthesiology during World War II. Ellison Pierce Symposium
- 2006 Ethical Aspects of refusing transfusion therapy in minors. Practical Aspects of Pediatric Anesthesia.
- 2006 Visiting Professor. Social capital. Department of Anesthesiology and Pain Medicine, St. Elizabeth's Medical Center. Boston, MA. November 15, 2006.
- 2004 Perioperative DNR orders. Practical Aspects of Pediatric Anesthesia. Boston, MA. May 5, 2004.
- 2002 Informed refusal. Harvard Medical School Anesthesia Review. May 7, 2002.
- 2000 DNR in the OR. Harvard Medical School Anesthesia Review & Update. Boston, MA. May 11, 2000.
- 1999 Perioperative refusal of resuscitation. Department of Anesthesiology, University of Texas Health Science Center. May 20, 1999.
- 1998 Grand Rounds. Ethics in wartime medicine. Brooke Army Medical Center, Fort Sam Houston. San Antonio, TX. January 7, 1998.
- 1994 Grand Rounds. Informed consent. Department of Anesthesiology. Children's Hospital, Boston, MA. April 13, 1994.

Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated With Yale:

International

- 2017 Geoffrey Kaye as a friend – Analysis of Kaye's Advice to Noel Gillespie. 9th International Symposium on the History of Anaesthesia. Boston, MA. October 25, 2017.
- 2015 Problem based learning discussion. Regional anesthesia: Conflict with patient. NWAC World Anesthesia Convention; Vancouver, Canada
- 2013 A select history of the professional standards of the American Board of Anesthesiology. 8th International Symposium on the History of Anaesthesia. Sidney, Australia. January 23, 2013.

National

- 2017 The Lectures of the Academy of Anesthesiology. Academy of Anesthesiology. Amelia Island, FL. March 24, 2017.
- 2014 Freaks. Academy of Anesthesiology. Tucson, AZ. February 20, 2014.
- 2014 Problem based learning discussion. A Request to Administer Anesthesia for a Child Who is Diagnosed with Brain Death. Society of Pediatric Anesthesia Annual Meeting. New Orleans, LA. October 10, 2014.
- 2013 A select history of the professional standards of the American Board of Anesthesiology. 8th International Symposium on the History of Anaesthesia. Sidney, Australia. January 23, 2013.

David B. Waisel, M.D.

- 1999 Problem based learning discussion. "Don't tell my mom!" Abortion and the minor, confidentiality and production pressure. American Society of Anesthesiologists Annual Meeting. Dallas, TX. October 9, 1999
- 1998 Problem based learning discussion. "Don't tell my mom!" Abortion and the minor, confidentiality and production pressure. American Society of Anesthesiologists Annual Meeting. Orlando, FL. October 17, 1998.
- 1997 Problem based learning discussion. "Don't tell my mom!" Abortion and the minor, confidentiality and production pressure. American Society of Anesthesiologists Annual Meeting. San Diego, CA. October 18, 1997.
- 1996 Problem based learning discussion. "Don't tell my mom!" Abortion and the minor, confidentiality and production pressure. American Society of Anesthesiologists Annual Meeting. New Orleans, LA. October 11, 1996.

Professional Service

Journal Service:

Editor

- 2012-2014 Editor-in-Chief. Bulletin of Anesthesia History (PubMed-indexed, published by the Anesthesia History Association.
- 2015-Present Editor-in-Chief. *Journal of Anesthesia History* (PubMed-indexed, published by Elsevier
- 2016-2017 Editor. Section on Humanities in Medicine, *Journal of Clinical Anesthesia*
- 2015 Guest Editor. *Unfamiliar Ethical Issues. Int Anes Clin* 2015;53(3).

Reviewer

- 1999-Present: *Annals of Internal Medicine; Anesthesia and Analgesia; Anesthesiology; Journal of Clinical Anesthesia; Journal of Clinical Ethics; British Journal of Anaesthesia; British Medical Journal Quality and Safety; Mayo Clinic Proceedings; New England Journal of Medicine; Pediatric Anesthesia*

Medical School:

- 2005-2009: Tutor, Patient-Doctor III (meet with MS3 1x/week for 4 MS3 year (8 months)

Professional Service for Professional Organizations:

American Board of Anesthesiology

- 2016-Present OSCE Exam Writing Committee, American Board of Anesthesiology
- 2007-Present Applied Exam Examiner

Wood Library Museum of Anesthesiology

- 2010-Present Chair, The WLM Patrick Sim Forum on the History of Anesthesiology
- 2009-2018 Board of Trustees, Wood Library-Museum of Anesthesiology
- 2012-2014 Treasurer, Wood Library-Museum of Anesthesiology

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American Society of Anesthesiologists

- 1995-2010 Committee on Ethics, American Society of Anesthesiologists
- 2000-2002 Task Force on Ethics, Council of Medical Specialties Society, Representing the ASA
- 2000-2002 Working Group on Education about Gifts to Physicians, American Medical Association, representing the ASA

Meeting Planning/Participation

- 2019-2020 Scientific Committee, 2020 World Congress of Anaesthesia
- 2018-2019 Scientific Program Committee, 2019 Academy of Anesthesiology
- 2019-2020 Chair, Scientific Program, 2020 Academy of Anesthesiology
- 2015-2016 Scientific Committee. 2016 World Congress of Anaesthesia
- 1999 Awards Committee Society of Air Force Clinical Surgeons 46th Annual Meeting

Pediatric Anesthesiology Program Director's Organization

- 2007-2009. Founder and First President
- 2007-2013 Member

Harvard University Service:

Medical School Committees

- 2004-2010 Ethics Leadership Group, Harvard Medical School
- 2009 Henry K. Beecher Prize in Medical Ethics Award Committee, Harvard Medical School
- 2008 Henry K. Beecher Prize in Medical Ethics Award Committee, Harvard Medical School
- 2007 Henry K. Beecher Prize in Medical Ethics Award Committee, Harvard Medical School

Boston Children's Hospital Service:

Hospital Boards & Committees

- 2006-2012 Senior Clinical Leadership Quality Council, Children's Hospital Boston
- 2006-2012 Chair, Education Committee, Program for Patient Safety and Quality, Boston Children's Hospital, Harvard Medical School, Boston, MA
- 2001-2012 Graduate Medical Education Committee, Children's Hospital Boston
- 2002-2005 Leadership Committee for ACGME Competencies. Children's Hospital Boston
- 1999-2012 Ethics Advisory Committee, Children's Hospital Boston

Departmental Committees

- 2016-2020 Scholarly Activity Committee, Department of Anesthesiology, Critical Care and Pain Medicine, Boston Children's Hospital
- 2016-2020 Scientific Review Committee, Department of Anesthesiology, Critical Care and Pain Medicine, Boston Children's Hospital

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- 2005-2013 Executive Committee, Department of Anesthesiology, Perioperative and Pain Medicine, Boston Children's Hospital
- 2003-2013 Clinical Competency Committee, Department of Anesthesiology, Perioperative and Pain Medicine, Boston Children's Hospital

Public Service:

Reprieve statements (Uncompensated)

- 2020 Consultant and Signer. Open Letter from Doctors Pharmacies and Health Experts – Lethal Injection and Covid 19. Stop Lethal Injection Project, Reprieve. April 9, 2020.
- 2013 Consultant. Daniel Wayne COOK, et al., Appellees v. FOOD & DRUG ADMINISTRATION, et al., Appellants. Nos. 12–5176, 12–5266. Decided: July 23, 2013.

Participation as a Legal Consultant to the Defense Team in Lethal Injection Cases
(Uncompensated except as required by State, in which case token compensation taken (<\$10).)

A partial listing of cases in which I have provided expert testimony concerning lethal injection-related matters, in court or by deposition:

1. Oklahoma: *Pavatt (Duty and Matthews) v. Jones*, Case No. 5:10-cv-141 (W.D. Okla.)
2. Georgia: *Blankenship v. Owens*, Civ. Action 2011-CV-202236 (Super. Ct. of Fulton County, Ga.)
3. Georgia: *DeYoung v. Owens*, Case No. 1:11-cv-2324 (N.D. Ga.)
4. Florida: *Valle v. Florida*, Case No. F-78-005281-A (11th Jud. Cir., Fl.)
5. Pennsylvania: *Chester v. Beard*, Case No. 1:08-cv-1261 (M.D. Pa.)
6. Texas: In Re: Edgar Tamayo, 14-20051 (5th Cir. 2014)
7. Ohio: *McGuire v. Ohio*, Case: 2:11-cv-01016-GLF-MRA (Southern District of Ohio, Eastern Division)
8. Guardian News & Media LLC v Charles L Ryan. 2015
9. California: Expert public opinion about the risks of California Department of Corrections and Rehabilitation's amendments and additions to Section 3349 of Title 15 of the California Code of Regulations (Lethal Injection Protocol). 2016. Prepared at the request of Berkeley Death Penalty Clinic (University of California, Berkeley School of Law) and the American Civil Liberties Union of Northern California
10. Nevada: *Dozier v. State of Nevada*, Case No. 05C215039
11. South Dakota: Charles Rhines, 2019
12. Georgia: Michael Wade Nance, 2020

*Selected Interviews in Public Media***Print**

1. Stein R. Group to censure physicians who play role in lethal injections. *The Washington Post*. May 2, 2010.
2. McGreal C. Arizona Execution Goes Ahead After Stay Lifted. *The Guardian* (on

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- line edition). October 27, 2010.
3. Zucken auf der Todespritze. *Der Spiegel* (online). October 27, 2010
 4. Execution drug still available after Lundbeck shuns ‘end user’ agreements. *Jyllands-Posten*. April 1, 2014. <https://jyllands-posten.dk/uknews/article4510313.ece/>
 5. Quigley R. 'He suffered greatly': Medical Expert Describes How Prisoner Thrashed Desperately During ‘Botched’ Execution with New Drug. *Daily Mail* (on line edition). June 30, 2011
 6. Redden M. New Lethal Injections Could Cause Extreme Pain, Make Deaths “Drag On” for Hours. *Mother Jones*. November 7, 2013. <http://www.motherjones.com/politics/2013/11/ohio-lethal-injection-cocktail-execution-drugs/>
 7. Dennis B, Sun LH. For More States, Execution Means Improvisation as Drug Supplies Dwindle. *The Washington Post*. April 30, 2014.
 8. Pilkington E. Doctor Angry Ohio Executed Inmate Despite ‘Horror’ Warning. *The Guardian*. June 20, 2014.
 9. McCarthy M. What’s the Best Way to Execute Someone? Doctors say Lethal Injection is Often Botched and Horrific. *Slate*. March 27, 2014.
 10. Sanburn J. Ohio Ups Lethal-Injection Dosages After Controversial Execution. *Time Magazine*. April 28, 2014.
 11. Jones A. Lethal-injection Drug Is Scrutinized. *Wall Street Journal* (on line edition). June 1, 2014.
 12. Mencimer S. Arizona Executioners Had To Use 15 Doses of Lethal Drugs Before Inmate Finally Died. *Mother Jones*. August 2, 2014. <http://www.motherjones.com/crime-justice/2014/08/arizona-executioners-injected-inmate-15-separate-doses-lethal-drugs/>
 13. Crair B. Exclusive Emails Show Ohio's Doubts About Lethal Injection. *The New Republic*. August 17, 2014.
 14. Sanburn J. 25 Secret Minutes Inside Oklahoma’s Execution Chamber. *Time*. May 1, 2014. <http://time.com/82787/oklahoma-botched-execution-clayton-lockett-lethal-injection-problems/>
 15. Allen-Mills T. Death Row’s Last Throes? *The Australian Times*. May 5, 2014.
 16. Page C. Lethal Injections Make Firing Squads Look Good. *Chicago Tribute*. May 7, 2014.
 17. Dart T. Arizona inmate Joseph Wood was injected 15 times with execution drugs. *The Guardian*. August 2, 2014. <https://www.theguardian.com/world/2014/aug/02/arizona-inmate-injected-15-times-execution-drugs-joseph-wood>
 18. Associated Press. Despite Drug Shortage, 2 States Carry on with Executions Using Single Dose of Potent Sedative. August 4, 2014.
 19. Eckholm E. Four Oklahoma Inmates Seek Delay in Executions. *New York Times*. January 10, 2015, p A4.
 20. Chamnah M. No One Knows Where Exactly Ohio Is Getting One of Its Execution Drugs. *Huffington Post*. January 14, 2015.
 21. Waldman A. Lethal Rejection: Will the Supreme Court’s Lethal Injection Review

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- Kill the Death Penalty? *PROPUBLICA*. February 4, 2015.
<https://www.propublica.org/article/will-the-supreme-courts-lethal-injection-review-kill-the-death-penalty>
22. Hannaford A. Does It Matter How a Condemned Man Dies? *British GQ*. April 21, 2017. <http://www.gq-magazine.co.uk/article/executions-in-usa>
 23. Goldschmidt D. Oklahoma commission recommends extending death penalty moratorium. CNN. April 25, 2017. Mohny G. The Drug at the Center of the Supreme Court Case on Lethal Injections. *ABC News*. April 29, 2015.
<http://www.cnn.com/2017/04/25/health/oklahoma-commission-recommends-death-penalty-moratorium/index.html>
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 25. Montero D. Prisoner wants to die, but debate rages in Nevada over whether to use a new lethal drug. *Los Angeles Times*. November 6, 2017.
<http://www.latimes.com/nation/la-na-nevada-death-penalty-20171106-story.html>
 26. Foote H. Experts ask death penalty states for scarce drugs that can treat CV-19 patients. *Tucson Sentinel*. April 20, 2020.
http://www.tucsonsentinel.com/local/report/042020_death_penalty_cv_drug/experts-ask-death-penalty-states-scarce-drugs-that-can-treat-cv-19-patients/

Television

1. Lethal Injection. *Religion and Ethics News Weekly*. PBS. March 28, 2008, Episode no.1130.
2. Greater Boston. January 24, 2014. <http://news.wgbh.org/post/local-anesthesiologist-ohio-lethal-injection-controversy>
3. Horrific Execution Timeline Detailed in Report. *Rachel Maddow Show*. MSNBC. May 1, 2014. <http://www.msnbc.com/rachel-maddow-show/watch/botched-execution-timeline-detailed-in-report-243603523788>.
4. *The Reid Report*. MSNBC. May 1, 2014.
5. Execution takes two hours, 15 injections. *Death Row Stories*. CNN. Originally aired August 16, 2015. <https://www.cnn.com/videos/tv/2015/08/12/death-row-stories-lethal-injection-reaction.cnn/video/playlists/death-row-stories/>
6. Death Penalty Debate. *Jim Braude Show*. WGBH News. April 25, 2017.
<http://news.wgbh.org/2017/04/25/news/death-penalty-debate>
7. Lethal Injection. *Last Week Tonight with John Oliver*. HBO. May 6, 2019 (replay of previous interview).

Radio

1. BBC5 Live. August 8, 2011.
2. Agony and Horror in Ohio Execution. *The Takeaway*. PRI and WYNC. January 22, 2014. <https://www.wnycstudios.org/podcasts/takeaway/segments/doctor-predicted-agony-and-horror-ohio-execution>
3. *BBC Newshour*. July 24, 2014. Radio

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2. **Waisel DB**, Fackler JC, Brunner JX, Kohane I. PEFIOS: an expert closed-loop oxygenation algorithm. *Medinfo* 1995;8Pt2:1132-1136.
3. **Waisel DB**, Truog RD. The cardiopulmonary resuscitation-not-indicated order: futility revisited. *Ann Intern Med* 1995;122:304-308.
4. **Waisel DB**, Truog RD. The benefits of the explanation of the risks of anesthesia in the day surgery patient. *J Clin Anesth* 1995;7:200-204.
5. Liang BA, Truog RD, **Waisel DB**. What needs to be said? Informed consent in the context of spinal anesthesia. *J Clin Anesth* 1996;8:525-527.
6. **Waisel DB**, Truog RD. An introduction to ethics. *Anesthesiology* 1997;87:411-417.
7. **Waisel DB**, Truog RD. The end-of-life sequence. *Anesthesiology* 1997;87:676-686.
8. **Waisel DB**, Truog RD. Informed consent. *Anesthesiology* 1997;87:968-978.
9. **Waisel DB**, Truog RD. How an anesthesiologist can use the ethics consultation service. *Anesthesiology* 1997;87:1231-1238.
10. Medell RJ, **Waisel DB**, Eskuri SA, Calicott RW. Field block for cranial surgery in World War II. *Mil Med* 1998;163:80-83.
11. Affleck PJ, **Waisel DB**, Cusick JM, Van Decar T. Recall of risks following labor epidural analgesia. *J Clin Anesth* 1998;10:111-114.
12. Truog RD, **Waisel DB**, Burns JP: DNR in the OR: A goal-directed approach. *Anesthesiology* 1999;90:289-295.
13. **Waisel DB**. Nonpatient care obligations of anesthesiologists. *Anesthesiology* 1999;91:1152-1158.
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15. **Waisel DB**. The hazards of "hanging crepe" or stating overly pessimistic prognoses. *J Clin Ethics* 2000;11(2):171-174.
16. **Waisel DB**. The role of World War II and the European Theatre of Operations in the development of anesthesiology as a physician specialty in the USA. *Anesthesiology* 2001;94:907-914.
17. Truog RD, **Waisel DB**. Do-not-resuscitate orders: from the ward to the operating room; from procedures to goals. *Int Anesthesiol Clin* 2001;39(3):53-66.
18. **Waisel DB**, Burns JP, Johnson JA, Hardart GE, Truog RD. Guidelines for perioperative do-not-resuscitate policies. *J Clin Anesth* 2002;14:467-473.
19. **Waisel DB**. Norman's War: Norman B. Kornfield, MD, World War II physician-anesthetist. *Anesthesiology* 2003;98:995-1003.
20. **Waisel DB**. Moral permissibility as a guide for decision making about conjoined twins. *Anesth Analg* 2005;101:41-43.
21. Truog RD, **Waisel DB**, Burns JP. Do-not-resuscitate orders in the surgical setting. *Lancet* 2005;365:733-735.
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23. Wright L, **Waisel DB**, Bacon DR. The Anlet: Anesthesiology's response to the needs of the Armed Forces in World War II. *Anesthesiology* 2006;104:179-182.
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26. Gawande A, Denno DW, Truog RD, **Waisel D**. Physicians and execution--highlights from a discussion of lethal injection. *N Engl J Med* 2008;358:448-451.
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31. Edwards ML, **Waisel DB**. 49 Mathoura Road: Geoffrey Kaye's letters to Paul M. Wood, 1939–1955. *Anesthesiology* 2014;121(6):1150-1157.
32. Bairdain S, Dodson B, Zurakowski D, **Waisel DB**, Jennings RW, Boretsky KR. Paravertebral nerve block catheters using chloroprocaine in infants with prolonged mechanical ventilation for treatment of long-gap esophageal atresia. *Paediatr Anaesth* 2015;25(11):1151-1157.
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37. Falciola V, **Waisel DB**. Surgical and anesthetic challenges aboard non-hospital ships in the pacific during world war II. *J Anesth Hist* 2018;4:214-221. doi: 10.1016/j.janh.2018.07.007.
38. **Waisel DB**, Ruben MA, Blanch-Hartigan D, Hall JA, Meyer EC, Blum RH. Compassionate and clinical behavior of residents in a simulated informed consent encounter. *Anesthesiology* 2020; 132:159-169.
39. Boretsky KR, Camelo C, **Waisel DB**, Falciola V, Sullivan C, Brusseau E, Eastburn E, Gomez-Moraz A, Luckanavanich W. Confirmation of success rate of landmark-based caudal blockade in children using ultrasound: a prospective analysis. *Paediatr Anaesth* 2020 Online ahead of print. doi: 10.1111/pan.13865.

Chapters, Books, and Reviews

40. **Waisel DB.** The physician in the arms race. In: Newell JD, Gabrielson IW, eds. *Medicine Looks at the Humanities*. Maryland: United Press of America; 1987. p. 127-129.
41. **Waisel DB.** Euthanasia. Ethical issues in anesthesia. *Advances in Anesthesia*. St. Louis: Mosby-Year Book; 1997. p. 250-253.
42. **Waisel DB, Jennings JE.** Informed consent in anesthesiology. In: Bready LL, Mullins RM, Noorily SH, Smith RB, eds. *Decision Making in Anesthesiology*, 3rd ed. St. Louis: Mosby-Year Book; 1999. p. 54-55.
43. Jennings JE, **Waisel DB.** Do-not-resuscitate in the operating room. In: Bready LL, Mullins RM, Noorily SH, Smith RB, eds. *Decision-Making in Anesthesiology*, 3rd ed. St. Louis: Mosby-Year Book; 1999. p. 56-57.
44. **Waisel DB.** Perioperative Do-not-resuscitate orders. *Curr Opin Anaesthesiol* 2000; 13:191-194.
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47. **Waisel DB.** Getting informed consent: an anesthesiologist's perspective. *Inspirations: The Anesthesia Residents' Quarterly* 2001;4(1):1-7.
48. **Waisel DB.** Could the attending be wrong? *Inspirations: The Anesthesia Residents' Quarterly*, 2001;4(3):12-16.
49. **Waisel DB.** Ethical issues in pain management and end-of-life care for the AIDS patient. In: Nedeljkovic S. *Pain Management of HIV/AIDS Patients*. Woburn: Butterworth Heinemann; 2002. p. 175-186.
50. **Waisel DB.** Ethical and legal issues in pediatric care. In: Yemen TA. *Pediatric Anesthesia Handbook*. New York: McGraw-Hill; 2002. p. 13-25.
51. **Waisel DB.** Medical professionalism: is it necessary or too arbitrary? *American Society of Anesthesiologists Newsletter* 2002;66(7).
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53. **Waisel DB, Jackson S, Fine P.** Should do-not-resuscitate orders be suspended for surgical cases? *Curr Opin Anaesthesiol* 2003;16:209-213.
54. **Waisel DB, Truog RD.** Medical Ethics and Anaesthesia. In: Healy TEJ, Cohen PJ, eds. *Wylie and Churchill-Davidson's A Practice of Anaesthesia*, 7th ed. London: Arnold; 2003. p. 1341-1352.
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56. **Waisel DB, Truog RD.** Ethical and legal aspects. In: Miller RD, Johns RA, Savarese JA, Wiener-Kronish JP, Young WL, eds. *Miller's Anesthesia*, 6th ed. Philadelphia: Elsevier Churchill Livingstone; 2005. p. 3175-3198.
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60. **Waisel DB**. Legal aspects of anesthesia care. In: Miller RD, Eriksson LI, Fleisher LA, Wiener-Kronish JP, Young WL, eds. *Miller's Anesthesia*, 7th ed. Philadelphia: Elsevier Churchill Livingstone; 2010. p. 221-236.
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62. Clendenin D, **Waisel DB**. Informed consent and the pediatric patient. In: Van Norman GA, Jackson S, Rosenbaum SH, Palmer SK, eds. New York: Cambridge University Press; 2011. p. 33-8.
63. Quaine JG, **Waisel DB**. Ethical use of restraints. In: Van Norman GA, Jackson S, Rosenbaum SH, Palmer SK, eds. New York: Cambridge University Press; 2011. p. 61-3.
64. McClain CD, **Waisel DB**. Triage and treatment of wounded during armed conflict. In: Van Norman GA, Jackson S, Rosenbaum SH, Palmer SK, eds. New York: Cambridge University Press; 2011. p. 275-9.
65. **Waisel DB**. Physician facilitation of torture and coercive interrogation. In: Van Norman GA, Jackson S, Rosenbaum SH, Palmer SK, eds. New York: Cambridge University Press; 2011. p. 280-4.
66. **Waisel DB**. Ethics and conflict of interest in anesthesia practice. In: Longnecker D, Brown DL, Newman MF, Zapol W, eds. *Anesthesiology*, 2nd ed. 2012. P 45-50.
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71. **Waisel DB**. Introduction: Unfamiliar ethical issues. *Int Anesthesiol Clin* 2015;53(3):vii-xii.
72. **Waisel DB**. Challenges in the LGBTQI+ community. *Int Anesthesiol Clin* 2015;53(3):53-62.
73. **Waisel DB**. A select history of the professional standards of the American Board of Anesthesiology. In: Cooper MG, Ball CM, Thirlwell JR, eds. *Proceedings of the 8th International Symposium on the History of Anaesthesia*. Sidney: Australian Society of Anaesthetists. 2017.
74. Zaleski KL, **Waisel DB**. Life and death in the ICU: ethical considerations. In: Gabrielli A, Layon AJ, Yu M, eds. Civetta, Taylor, Kirby's Critical Care, 5th ed. Philadelphia: Lippincott Williams & Wilkins; 2016
75. **Waisel DB**. Ethics of research for patients in pain. *Curr Opin Anaesthesiol* 2017;30(2):205-210.

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78. **Waisel DB.** Do-not-resuscitate orders. In: Switzer B. *Preoperative Assessment and Management*, 3rd ed. Philadelphia, PA: Wolters-Kluwer. 2018:538-41.
79. Shah M, **Waisel DB.** Ethics in pediatric anesthesia. In: Lawani K, Cohen IT, Choi EY, Raman VT, eds. *Pediatric Anesthesia: A Problem-Based Learning Approach*. Oxford University Press: New York Press. 2018. P. 601-9.
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Invited Editorials and Commentaries

81. Merrill DG, **Waisel DB.** Physician-assisted suicide: Con/Pro. *American Society of Anesthesiologists Newsletter* 1998;62(3):5-8.
82. **Waisel DB.** Let the patient drive the informed consent process: ignore legal requirements. *Anesth Analg* 2011;113:13-15.
83. **Waisel DB.** Unrecognized barriers to perioperative limitations on potentially life-sustaining medical treatment *J Clin Anesth* 2014;26:171-173.
84. **Waisel DB.** Thoughts on the *Bulletin*. *Bull Anesth Hist* 2013;31(1):1.
85. **Waisel DB.** Welcome to the *Journal of Anesthesia History*. *J Anesth Hist* 2015;1(1):1.
86. **Waisel DB,** Mancuso TJ, Boretsky R. Pediatric research, risk, and paravertebral blocks. *Anesth Analg* 2015;120(5):987-989.
87. **Waisel DB.** We need personalized assessments for implicit bias in higher risk situations. *Paediatr Anaesth* 2018;28(1):6-7.
88. **Waisel DB.** “That’s not what I said”: seeking fidelity in citations. *Anesth Analg* 2018;126:393-4.
89. **Waisel DB.** Book Review. Oh Excellent Air Bag: Under the Influence of Nitrous Oxide, 1799 – 1920. *Anesthesiology* 2018;128: 688-689.
90. **Waisel DB.** Book Review. Ethical Issues in Anesthesiology and Surgery. *Anesth Analg* 2016;123:1054.
91. **Waisel DB.** Wartime and combat anesthesia. *J Anesth Hist* 2018;4:203-204.

Practice Guidelines, Standards and Consensus Statements

Case Reports, Technical Notes, Letters

92. Elder J, **Waisel DB.** Case report of the one-armed anesthesiology resident. *J Clin Anesth* 2004;16:445-448.
93. Scheu KL, **Waisel DB.** Regional anesthesia equipment checkout recommendations: A case report and discussion. *J Clin Anesth* 1998;10:502-505.

David B. Waisel, M.D.

94. Hasan A, Alrayashi W, **Waisel DB**, Boretsky K. A case report of incidental hepatic cysts found on ultrasound imaging: implications for the anesthesiologist. *A A Case Rep* 2018;10:33-35.

Non-peer reviewed scientific or medical publications/materials in print or other media

95. **Waisel DB**. Should Medical Professionals Participate in Executions. *The National Association of Defense Lawyers Champion Magazine*. June 2010, p 38.
96. **Waisel DB**, Litton P. Why the Lethal Injection Drug Debated by the Supreme Court Today is Unconstitutional. *New Republic*. April 29, 2016.
97. **Waisel DB**. The drugs we use for executions can cause immense pain and suffering. *The Washington Post*. May 11, 2017.

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA**

Justice 360,

Plaintiff,

v.

Bryan P. Stirling, Director of the South Carolina
Department of Corrections; and Alan Wilson,
South Carolina Attorney General,

Defendants.

Civil Action No. 3:20-03671-MGL

DECLARATION OF JAMES H. RUBLE

I, JAMES H. RUBLE, declare under penalty of perjury that the following is true and correct:

1. My name is James H. Ruble. I am over eighteen years old and I am competent to give sworn testimony in a court of law.
2. I am a registered pharmacist in the State of Utah. I am also an Associate Professor (Clinical) in the Department of Pharmacotherapy and an Adjunct Associate Professor in the Department of Pharmaceutics and Pharmaceutical Chemistry at the University of Utah College of Pharmacy, as well as an Adjunct Associate Professor in the Program in Medical Ethics and Humanities, Department of Internal Medicine, University of Utah School of Medicine. I am an Adjunct Associate Professor in the University of Utah College of Law.
3. I am making this declaration in my individual capacity, and my observations should not be interpreted as those of my employer or any other organization.
4. I understand that the South Carolina Attorney General has interpreted a state statute (S.C. Code § 24-3-580 entitled “Disclosure of identity of execution team member prohibited”) as covering all information related to the lethal injection protocol used by the State of South Carolina.

Because the state has provided no information about its lethal injection protocol, I am unable at this time to offer any advice or expert opinions, to a reasonable degree of scientific certainty, to Justice 360 or its clients.

5. I submit this declaration to the Court to explain that, if given the requested information, I would be able to develop an expert opinion as to the relative risk of a “botched” execution presented by the compounded drug used in lethal injections. Botched executions occur when the protocol is poorly designed or improperly implemented. Given that the drugs used to carry out executions by lethal injection typically cannot be purchased from large-scale manufacturers, the most likely way that South Carolina could legally obtain the drugs is through use of a compounding pharmacy. In this Declaration, I first describe the minimum elements that need to be known about the preparation of a compounded drug, the pharmacy from which it is compounded, and the pharmacists who prepared and supplied it. Next, I assess the elements of a lethal injection chemical formulation necessary to determine if a lethal injection drug is fit for its intended use, and whether there is a risk of the chemical formulation causing a botched execution. I conclude that the Attorney General’s interpretation of the South Carolina statute makes it impossible for me to advise Justice 360 attorneys or their clients as to relative pain levels associated with the state’s protocols for execution by lethal injection. I describe how I am impaired from making a determination of whether a lethal injection does or does not meet constitutional standards.

6. The information in this Declaration is based upon my personal knowledge and sources of the type relied upon by researchers and practitioners in my field. I am not being compensated for providing this Declaration.

Background and Qualifications

7. I have received a Doctor of Pharmacy, a Juris Doctor, a Bachelor of Science in Pharmacy, and a Bachelor of Science in Biology (with a Molecular & Biochemistry emphasis) from the University of Utah, in Salt Lake City. My complete curriculum vitae is attached as Exhibit 1.

8. I teach pharmacy law, health-care ethics, and pharmaceutical compounding to professional pharmacy students and graduate students and have received numerous teaching awards. I also teach professionals in other disciplines, including medical students, nursing students, physician assistant students, physical and occupational therapy, dental students, and law students. In the fall 2020 semester, I am teaching a course on FDA law and regulations at the University of Utah S.J. Quinney College of Law. I am Chair of the Utah Department of Health Controlled Substances Advisory Committee.

9. I have been a registered pharmacist in Utah since 1992, and I have over 25 years of experience as a practicing pharmacist. I currently serve as an Associate Professor in the Department of Pharmacotherapy and as an Adjunct Assistant Professor in the Department of Pharmaceutics and Pharmaceutical Chemistry, and as an Adjunct Associate Professor in the Program of Medical Ethics and Humanities. I served as a member of the Hospital Ethics Committee for over ten years. I have also served as an ombudsman for a health sciences center. I have practice experience as a Staff Pharmacist, Clinical Pharmacist, and Pharmacy Administrator.

10. I am the author of over 20 articles, letters, chapters, and reports, focusing primarily on clinical practices and the uses of pharmaceutical drugs. These pieces have been published in the *Journal of the American Medical Association*, the *Journal of Pain & Palliative Care Pharmacotherapy*, the *American Journal of Health-System Pharmacy*, and *Pharmacotherapy*, among others. A full list of my publications is included in the attached curriculum vitae. I have

given presentations on topics such as pharmaceutical compounding, health care ethics, health care regulation, and health care safety, including numerous presentations to the American Society for Pharmacy Law.

Drug Quality and its Relationship to Source

11. Information about a drug's properties are necessary for me to know whether the drug is fit for its intended use, and would not be expected to cause severe pain upon administration.

12. As a pharmacist, access to information about a drug's source, purity, potency, and formulation would provide me some of the pharmacokinetic and pharmacodynamic information—pharmacokinetics is the study of the body's effects on drugs; pharmacodynamics is the study of drugs' effects on the body. I would need in order to anticipate how a given dose and formulation of a drug will affect an inmate, including the speed with which a drug should have its intended effect, the timing of the onset of the drug's effects, and the drug's distribution to assess the likelihood of unnecessary pain upon administration.

13. Knowing the source of a pharmaceutical formulation, including whether commercial or compounded, provides valuable information about the conditions under which the drug was created, the reputation and skills of the pharmacists, and any history of past regulatory concerns. This information enhances confidence in the quality of the drugs, and in particular informs an assessment of the drugs' potency, stability, osmolarity, pH, sterility and quality. In my professional judgment, collectively, these are all factors that a prudent pharmacist would take into account.

Compounding Pharmacies

14. Compounding pharmacies serve many functions, including making drugs for individuals who are unable to take commercially manufactured drugs. For example, an individual requiring an

API (active pharmaceutical ingredient) —the working part of the drug—may be allergic to an inactive ingredient or added substance used in commercially manufactured drugs containing that API. In that case, a compounding pharmacy could make a drug that contains the API the individual needs without the allergen. Essentially, compounding pharmacies provide patient-customized therapies.

15. Compounding pharmacies mix or combine APIs with additives to create drugs tailored to the needs of individual patients. That is, when an individual takes a drug, it is a combination of the API and additives. The additives provide a number of properties, including providing a mechanism or vehicle for carrying the API into the body and compounded drugs can be prepared and delivered in a variety of dose formulation including pills, tablets, capsules, topical bases, oral solutions and injectable solutions.

16. Compounding pharmacies and the drugs they make are not subjected to the same FDA scrutiny as commercial products. Compounding pharmacies are subject to less scrutiny, not because the FDA views these pharmacies as reliable, but because the FDA views these pharmacies as relatively low risk given the small volume of drugs they typically produce and the customized nature of their intended purpose.

17. The 2013 Drug Quality and Security Act, Public Law 113-54-Nov. 27, 2013, defined two types of compounding pharmacies: traditional and non-traditional. These two types of compounding are frequently referred to by their corresponding statutory provisions as “503 A” compounding and “503 B” compounding.

18. Unlike drugs obtained from commercial sources that are subject to extensive FDA regulation and oversight, including through the drug approval process and through manufacturing standards and procedures mandated under the current Good Manufacturing Practices (cGMP), if a

drug is compounded by a traditional (503 A) compounder, the FDA does not verify the safety or effectiveness of these pharmaceutical preparations or the quality of their manufacture. These compounded preparations thus remain outside the FDA regulatory framework that otherwise ensures these qualities in manufactured commercial products.

19. Following the enactment of the Drug Quality and Security Act, 503 B compounding pharmacies may choose to register with the FDA as “outsourcing facilities.”¹ An outsourcing facility is a pharmacy at one geographic location that is engaged in the compounding of sterile chemicals and complies with all of the requirements of section 503B, which includes registration with the FDA as an outsourcing facility. Chemicals compounded by an outsourcing facility can qualify for exemptions from FDA approval requirements and the requirement to label products with adequate information for use, but they are not exempt from current good manufacturing practice (CGMP) requirements. To register as an outsourcing facility, non-traditional compounding pharmacies must comply with the FDA’s current GMP, as dictated by its “Interim Guidance for Human Drug Compounding Outsourcing Facilities Under Section 503 B of the Federal Food, Drug, and Cosmetic Act.” Outsourcing facilities must also accept the jurisdiction and authority of the FDA to inspect their facilities. While the FDA maintains an online database cataloging any regulatory actions taken with respect to registered pharmacies, the FDA does not verify the quality, safety or effectiveness of compounded preparation or chemical formulations from traditional compounders or non-traditional, outsourcing compounding facilities.

20. In my experience, compounding pharmacies, in practice, vary significantly in the degree to which they in fact abide by and comply with the regulations and standards they purport to follow. While many compounding pharmacies have sterile environments, suitable for preparing chemical

¹ Drug Quality and Security Act, 21 USCA § 301.102 (2013).

formulations, we know that the majority of compounding pharmacies are not equipped to provide sterile formulations. For example, at the New England Compounding Center in Massachusetts, there was stagnant water, dirty powder hoods, and air intake from a neighboring recycling plant that spewed dust and contaminants. As a result, many injectable steroid formulations were contaminated, and resulted in a deadly meningitis outbreak involving at least 751 individual people, and 64 reported deaths. This is just one example of the many risks that arise from unregulated, unclean compounding pharmacies. While some compounding pharmacies provide high-quality preparations, others do not. New England Compounding Center is not the only example of botched compounding. In 2005, solutions to protect the heart during heart bypass surgery were incorrectly compounded by a compounding pharmacy in Maryland and resulted in ten patient deaths from two contaminated lots.

21. Disclosure of the identity and reputation of the supplier of a raw chemical as well as the training and experience of the persons using that raw source to compound preparations are crucial to an evaluation of the quality and reliability of those preparations. 503 A compounding pharmacies must comply with the United States Pharmacopeia (USP), especially General Chapters 795 and 797. Under this guidance, compounding pharmacies that are unable to obtain raw chemicals from an FDA-registered facility are required to establish the safety of the chemicals they do obtain by investigating the reputation and reliability of the chemicals' manufacturer. 503 B compounding pharmacies must comply with current Good Manufacturing Practices (cGMPs), which have additional requirements for source of raw chemicals.

22. The pharmacy from which South Carolina procures the lethal chemicals may not be located in South Carolina. The compounded preparations therefore could be regulated by a different jurisdiction with more or less regulation. Access to the jurisdiction and source of the compounded

preparations reveals critical information regarding the policies and procedures of the compounding pharmacies, including what regulations, if any, the pharmacies are subject to, and whether the pharmacy has been subject to any sanctions. Without this requested information about regulations pharmacies are subject to, I am unable to evaluate the fitness of the compounded preparation for its intended use.

23. Access to the source, in particular, of a compounded formulation reveals critical information regarding the policies and procedures of the pharmacies (if a compounding pharmacy is making it): what regulations, if any, they are subject to, and whether the pharmacy or pharmacists have been subject to any sanctions. Access to the source of compounded formulation also reveals whether the pharmacists have had any disciplinary incidents, their compounding training, and how many years of compounding experience those pharmacists possess.

24. Training and credentials of the pharmacist(s) and pharmacy personnel are critical to understanding the standards under which the preparation was compounded. State and federal pharmacy licensing, compliance with United States Pharmacopeia Guidance, facility design, and facility requirements are equally critical, as are the rigorous environments in which the preparations were compounded.

25. Without information about the regulations that the compounded preparations are subject to, the already-high risk that a compounded preparation would be contaminated is further elevated. In my analysis to determine the risk if the compounded formulation is contaminated, I would need to conduct a visual inspection of the finished compounded formulation. In addition, depending on batch size, I would need to review results from sterility and endotoxin testing, by internal or outsourced laboratories. To determine potency, I would need to review the certificate of analysis

of the active ingredients, documentation of storage conditions, and any subsequent tests for potency.

Risks Posed by Drugs Prepared by Compounding Pharmacies: Concentration, Potency, Stability and Unintended Additives

26. Drug potencies deteriorate over time, and if not stored properly drug potencies will deteriorate more rapidly. Without regulations, compounded formulations could be stored indefinitely and result in a complete loss of potency. A reduced or non-potent formulation will likely be ineffective to execute the condemned individual or will be a substantial risk of prolonging the execution process proportional to the amount of reduced potency.

27. There are many factors to consider in determining fitness of the chemical formulation for its intended use. Error in the preparation process, improper storage, or exposure to higher heat than is generally allowed could all result in a loss of potency of the chemical solution. Light conditions could also promote degradation. If, for example, a drug was stored in a room that was set to an improper temperature, or the drug was stored in direct sunlight, the drug would deteriorate more quickly or transform into something even more harmful. For example, the solution may precipitate and appear cloudy as the chemicals shift to a solid form and fall out of solution. This precipitate is a solid crystal formation which would be expected to cause severe pain during intravenous injection of the compounded drug. This discovery of crystals in a chemical solution delayed an execution in Georgia.²

28. Another effect of combining incompatible chemicals is the formation of an amorphous solid material, “a rock,” or large piece of solid material. Solid rock formation is distinct from

² *Georgia delays woman’s execution because of ‘cloudy’ lethal injection drug*, The Guardian, (Mar. 2, 2015), <https://www.theguardian.com/world/2015/mar/03/georgia-delays-womans-execution-because-of-cloudy-lethal-injection-drug>).

crystallization. The larger chemicals come together to form a rock that is pushed through the solution into the veins upon injection. The chemical solid particulate then can perforate or occlude the veins.³

29. The physical and chemical parameters discussed in paragraphs 27 and 28, including and not limited to the pH of the drugs, are more complex depending on the method of administration of the lethal injection chemicals. For example, whether the chemicals are combined in an admixture—i.e., the same solution—or combined in a syringe may increase the likelihood of precipitation for the specific chemicals the South Carolina Department of Corrections proposes to use, namely a combination of pentobarbital and pancuronium. Without more information on the specific method of administration, I am unable to give an expert opinion on the substantial likelihood of severe pain due to the risk of precipitation.

30. Finally, if compounded in an unclean environment, the chemicals could be contaminated with a fungus or microbial organism, chemical, or other toxin that renders the drug excessively painful. The presence of fungus or microbial organisms could also render the anesthetic drug impotent.

Inability to Render an Opinion

31. I was contacted by attorneys at Justice 360 in Columbia, South Carolina, who asked for my advice and expert opinions regarding South Carolina's potential plans to carry out an execution by lethal injection in the near future. It is my understanding that they need this information to counsel and advise clients on death row whether to elect lethal injection or electrocution as the method of execution or whether to propose another alternative manner of death.

32. Without any information about South Carolina's lethal injection protocol, I am unable to formulate any relevant opinions or offer any expert advice. I cannot advise Justice 360 about the risks of a botched execution, the scientific validity or reliability of South Carolina's intended plan, the relative pain or efficacy of the intended plan compared to alternatives, or the likelihood of an unconstitutional execution, i.e., one that inflicts needless pain.

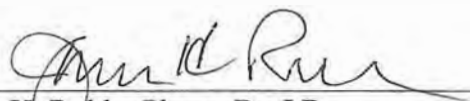
33. In order to offer Justice 360 and its clients an opinion, to a reasonable degree of scientific certainty, in this matter, I would need to know the following:

- a. the specific chemicals South Carolina plans to use during an execution by lethal injection
- b. the specific formula for each chemical, including the active and inactive ingredients
- c. the manufacturer, source requirements, storage requirements and chain of custody for each specific chemical
- d. the qualifications of the people who compounded the drug
- e. whether the compounding pharmacy is a licensed pharmacy, whether it has been sanctioned, and the results of the pharmacy's most recent inspection results.

I affirm, under the penalty of perjury, that the foregoing is true and correct to the best of my knowledge.

Dated: November 21, 2020

Salt Lake City, Utah


James H. Ruble, Pharm.D., J.D.

James H. Ruble

October 2019

PERSONAL DATA

Birth: Coronado, California
Citizenship: United States of America
Address & Phone (W): University of Utah College of Pharmacy, Skaggs Pharmacy Institute,
30 South 2000 East, Room 4924, Salt Lake City, Utah, 84112
Office: (801) 581-4514
e-mail address: jim.ruble@hsc.utah.edu
web profile: <http://pharmacy.utah.edu/pharmacotherapy/faculty/ruble.php>

EMPLOYMENT / PROFESSIONAL EXPERIENCE

Academia Positions

2016 – Present Adjunct Associate Professor, Medical Ethics and Humanities, Department of
Internal Medicine, School of Medicine, University of Utah, Salt Lake City,
Utah
2013 – Present Associate Professor (Clinical), Department of Pharmacotherapy, College of
Pharmacy, Skaggs Pharmacy Institute, University of Utah, Salt Lake City,
Utah
Assistant Professor (Clinical) 2010 – 2013
Clinical Assistant Professor (Adjunct) 1995 – 2010
2017 – Present Adjunct Associate Professor, Department of Pharmaceutics and
Pharmaceutical Chemistry, College of Pharmacy, Skaggs Pharmacy Institute,
University of Utah, Salt Lake City, Utah
Adjunct Assistant Professor 2010 – 2016
2006 – 2011, Visiting Faculty, Roseman University of Health Sciences, South Jordan, Utah
2018

Non-academia Positions – Health Care

2018 – Present Faculty Relations Specialist, University of Utah Health Sciences, Office of the
Associate Vice President for Faculty and Academic Affairs, School of
Medicine, Salt Lake City, Utah
2016 – 2018 Ombudsman, University of Utah Health Sciences, Office of the Associate
Vice President for Faculty and Academic Affairs, School of Medicine, Salt
Lake City, Utah
2009 – 2016 Clinical Pharmacist, Department of Pharmacy Services, University of Utah
Health Care, Salt Lake City, Utah
2007 – 2009 Manager, Infusion Pharmacy, Department of Pharmacy Services, University
of Utah Health Care, Salt Lake City, Utah

2004 – 2007 Sterile Compounding/IV Admix Clinical Pharmacist, Department of Pharmacy Services, University of Utah Health Care, Salt Lake City, Utah

2000 – 2001 Staff Pharmacist, Target Stores Pharmacy, Centerville, Utah

1996 – 1999 Clinical Pharmacist in Ambulatory Neurology and Neurosurgery, Department of Pharmacy Services, University of Utah Health Care, Salt Lake City, Utah

1995 – 1996 Clinical Pharmacist in Drug Information, Department of Pharmacy Services, University of Utah Health Care, Salt Lake City, Utah

1994 – 1995 Pediatric Pharmacy Team Coordinator, Pharmacy Department, Geisinger Medical Center, Janet Weis Children's Hospital, Danville, Pennsylvania

1992 – 1994 Staff Pharmacist, Pharmacy Department, Primary Children's Medical Center, Salt Lake City, Utah

1989 – 1992 Pharmacist Intern, Pharmacy Department, Primary Children's Medical Center, Salt Lake City, Utah

1988 – 1990 Clinical Technologist, Sleep Disorders Center, University of Utah Health Care, Salt Lake City, Utah

1985 – 1988 Pulmonary Function Technician, Pulmonary Laboratory, University of Utah Health Care, Salt Lake City, Utah

1985 – 1985 Anesthesiology Technician, Anesthesiology Workroom, University of Utah Health Care, Salt Lake City, Utah

Non-academia Positions – Law and Consulting

2013 – Present Founder and Member, Salus Consulting, LLC, Bountiful, Utah

2004 – 2006 Attorney, Wasatch Intellectual Property Services, LLC, N. Salt Lake, Utah

2002 – 2005 Associate Attorney, Pate Pierce & Baird, PC, Salt Lake City, Utah

2001 – 2001 Law Clerk, Jones Waldo Holbrook & McDonough, PC, Salt Lake City, Utah

2000 – 2000 Independent Consultant, Christensen & Jensen, PC, Salt Lake City, Utah

EDUCATION

<u>Degree</u>	<u>Years</u>	<u>Institution</u>
Juris Doctor	1999 – 2002	University of Utah
Doctor of Pharmacy	1992 – 1994	University of Utah
Bachelor of Science – Pharmacy	1989 – 1992	University of Utah
Bachelor of Science – Biology (Molecular & Biochemistry emphasis)	1984 – 1989	University of Utah

LICENSURE/CERTIFICATION/ADDITIONAL TRAINING

2019 – 2020 Academic Leadership Fellows Program (ALFP), American Association of Colleges of Pharmacy, Arlington, Virginia

2016 – 2017 Conflict Resolution Graduate Certificate Program, University of Utah, Department of Communication (Certificate awarded April 2017)

- 2016 Foundations of Organizational Ombudsman Practice, International Ombudsman Association (IOA), Santa Ana, California, June 2016
- 2014 – Present Basic Life Support for Healthcare Providers (CPR and AED), American Heart Association
- 2004 – Present Registered Patent Attorney, United States Patent and Trademark Office, Reg. No. 56118
- 2002 – Present Attorney, Utah State Bar, Member No. 09426
- 1994 – 1996 Registered Pharmacist – Pennsylvania Board of Pharmacy License No. RP041317R (expired 9/30/1996)
- 1992 – Present Registered Pharmacist – Utah Division of Occupational and Professional Licensing, License No. 153627-1701 (expires 9/30/2021)
- 1986 – 1988 Certified Pulmonary Function Technician (CPFT), National Board for Respiratory Care
- 1985 – 1997 Advanced Cardiovascular Life Support (ACLS), American Heart Association
- 1985 – 1997 Basic Life Support (BLS). American Heart Association

HONORS, RECOGNITIONS & AWARDS

- 2019 Distinguished Teaching Award & Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2019 P2 Class Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2018 P1 Class Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2017 Overall Best Mediator, recognized by Peers and Faculty in Conflict Resolution Graduate Certificate Course, University of Utah, Salt Lake City, Utah
- 2016 P3 Class Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2015 Leadership in Ethics Education Award, Daniels Fund/David Eccles School of Business, University of Utah, Salt Lake City, Utah
- 2015 Outstanding Professor Award, Hinckley Institute, Univ. of Utah, Salt Lake City, Utah
- 2014 Distinguished Teaching Award & Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2014 P4 and P2 Class Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2011 Distinguished Teaching Award & Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2011 P2 Class Teacher of the Year, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 2005 Partners-in-Caring Award, University of Utah Health Care, Salt Lake City, Utah

- 1995 Employee Recognition Award for Outstanding Service, Geisinger Medical Center, Danville, Pennsylvania
- 1993 Ewart Swinyard Scholarship, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 1992 Facts and Comparisons Award for Excellence in Clinical Communications, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 1992 McNeil Pharmaceuticals Award for Outstanding Achievement in Pharmacy Administration, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 1991 Allen and Hanburys Scholarship, University of Utah, Salt Lake City, Utah
- 1991 Faculty Scholarship, College of Pharmacy, University of Utah, Salt Lake City, Utah

RESEARCH AND SCHOLARLY WORK

Grants

- 2016 – 2019 Treatment patterns, patient outcomes, and healthcare charges in hemophilia at Hemophilia Treatment Centers in the Intermountain West.
Principal Investigator: David Stenejem, PharmD, BCOP
Biogen/IDEC
Direct Costs: \$462,500 Total Costs: \$613,738
Role: Co-Investigator (< 5%)
- 2012 – 2014 Evaluation, Research, Survey and Recommendations: Physician Dispensing Exemption from Pharmacy Licensure. Requirement RFP Solicitation No. MP12023, State of Utah
Principal Investigator: Mark Munger, PharmD
Direct Costs: \$67,000 Total Costs: \$67,000
Role: Co-Investigator (40%)
- 2011 – 2013 Promoting the Pharmacy Profession as a Career Pathway for Female Students and Students from Ethnically Diverse Backgrounds
Principal Investigator: James H. Ruble
Direct Costs: \$3,500 Total Costs: \$3,500
Educational Resources Development Council
Role: Principal Investigator (100%)
- 2012 – 2012 Evaluation of buffer solutions and impact of gas sterilization processes
Principal Investigator: Mark Munger, PharmD
Direct Costs: \$15,000 Total Costs: \$15,000
BARD Access Systems, Inc.
Role: Co-Investigator (50%)
- 1998 – 1998 Comprehensive evaluation of psychometric assessment tools in Alzheimer's disease
Principal Investigator: Gary Oderda, PharmD, MPH
Direct Costs: \$10,000 Total Costs: \$10,000
Novartis Pharmaceuticals Corporation
Role: Co-Investigator (50%)

PUBLICATIONS

Peer-Reviewed Journal Articles

15. Albert EL, Mospan GA, Panther S, Rosenberg E, **Ruble JH**, Stein RL. Benchmarking Pharmacy Law Education in Doctor of Pharmacy Programs: A Call to Action Based on Initial Survey Results. *Am J Pharm Educ.* 2019; (Accepted; manuscript number assigned: ajpe7172).
14. Tak CR, Gunning K, Kim J, Sherwin CM, **Ruble JH**, Nickman NA, Biskupiak JE. The effect of a prescription order requirement for pharmacist-administered vaccination on herpes zoster vaccination rates. *Vaccine.* 2019 Jan 21;37(4):631-636. doi: 10.1016/j.vaccine.2018.12.003. Epub 2018 Dec 15.
13. **Ruble JH.** Evaluation of US Federal Legislation for Opioid Abuse: 1973-2016. *J Pain Palliat Care Pharmacother.* 2016 Sep;30(3):218-24. doi: 10.1080/15360288.2016.1211213.
12. Feehan M, Durante R, **Ruble JH**, Munger MA. Qualitative Interviews about Pharmacist Prescribing in the Community Setting. *Am J Health-Syst Pharm.* 2016 Sep 15;73(18):1456-61. doi: 10.2146/ajhp150691.
11. **Ruble JH.** Tools for “decloaking” the elephant in the room: Conflict-of-interest, Shared Decision-Making and Patient-Centered Care [Commentary]. *J Pain Palliat Care Pharmacother.* 2015 Jun;29(2):173-7. doi: 10.3109/15360288.2015.1037519.
10. **Ruble JH.** The “death” of lethal injection as we know it? An opportunity to reflect on the role of chemical execution in the US criminal justice system [Commentary]. *J Pain Palliat Care Pharmacother.* 2014 Sep;28(3):276-81. doi: 10.3109/15360288.2014.941133. Epub 2014 Aug 14.
9. Munger MA, **Ruble JH**, Nelson SD, Ranker L, Petty RC, Silverstein, S, et al. National Evaluation of Prescriber Drug Dispensing. *Pharmacotherapy.* 2014 Oct;34(10):1012-21. doi: 10.1002/phar.1461. Epub 2014 Jul 23.
8. **Ruble JH.** Prescriber-Pharmacist Collaboration: Re-engineering the Partnership to Optimize Pain Patient Care [Commentary]. *J Pain Palliat Care Pharmacother.* 2013 Dec;27(4):365-6. doi: 10.3109/15360288.2013.849322. Epub 2013 Oct 21.
7. **Ruble JH.** Distribution of Controlled Substances in the US Supply Chain: Where does the Compass Point? [Commentary]. *J Pain Palliat Care Pharmacother.* 2012 Sep;26(3):251-3. doi: 10.3109/15360288.2012.703983.
6. Shrewsbury R, Augustine S, Birnie C, Nagel K, Ray D, **Ruble J**, Scolaro K, Athay Adams J. AACP Report: Assessment and Recommendations of Compounding Education in AACP Member Institutions. *Am J Pharm Educ.* 2012 Sep 10;76(7):S9. doi: 10.5688/ajpe767S9.
5. **Ruble JH.** Off-label Prescribing of Medications for Pain: Maintaining Optimal Care at an Intersection of Law, Public Policy and Ethics. *J Pain Palliat Care Pharmacother.* 2012;26:146-52.
4. **Ruble JH.** Baxter v. Montana, Libertarianism, and End-of-Life: The Ripe Time for a Paradigm Shift. *J Pain Palliat Care Pharmacother.* 2010 Sep;24(3):263-70. doi: 10.3109/15360288.2010.502214.

3. **Ruble J**, Matsuo F. Antiepileptic-induced cutaneous drug reactions: Incidence, mechanisms, and management. *CNS Drugs*. 1999;12(3): 215-36.
2. **Ruble J**, Muncey LA. Beta-adrenergic agonists in the treatment of asthma. *J Pharm Care Pain Symptom Control*. 1997;5(4): 49-56.
1. Goeser S, **Ruble J**. Melatonin: Historical and clinical perspectives. *J Pharm Care Pain Symptom Control*. 1997;5(1):37-49.

Letters and Other Publications

7. **Ruble JH**, Brixner DA. Comment & Response: Outpatient Pharmacy Expenditures for Children with Serious Chronic Illness in California, 2010-2012. *JAMA*. 2016;315(7):706. doi:10.1001/jama.2015.16978.
6. Subach RA, **Ruble J**. Misprint of dosage interval for liposomal doxorubicin hydrochloride [Letter]. *Am J Health Syst Pharm*. 1996;53(14):1727.
5. **Ruble JH**. Pharmacoeconomics – an evolving tool in health technology assessment. Division of Medical Ethics and Humanities Newsletter, School of Medicine, University of Utah. June 2016. Available at: <http://medicine.utah.edu/internalmedicine/medicalethics/newsletters/index.php>
4. **Ruble J**. Impact safety, efficiency, and the bottom line with premixed IV products. *Pharmacy Purchasing & Products*. 2008;5(2):34,36,38.
3. **Ruble J**. USP Chapter <797> Compliance: Important legal issues. *Pharmacy Purchasing & Products*. 2008;5(6):16,18,20.
2. **Ruble J**, Hill GK. Inadvertent Public Disclosure and Possible Loss of Intellectual Property Rights. *Nutraceutical Business & Technology* 2005;1(5):34-40.
1. **Ruble J**, Koberstein W, ed. Special Report: The Secure IPO Launch Plan – A Virtual Roundtable. *BioExecutive International* 2005;1(4):58-67.

Book Chapters

1. **Ruble JH**. Compounded medications in pain management: customized rational polypharmacy. In: Aronoff GM, editor. Medication management of chronic pain: what you need to know. Bloomington, IN:Trafford Publishing; 2017.

Scientific Posters and Abstracts

13. Winter K, **Ruble J**. (2019). *Pharmacist Perceptions of Ethical Dilemmas Encountered in Acute Care/Institutional Practice*. American College of Clinical Pharmacy (ACCP) Annual Meeting, New York City, New York. [submitted]
12. Knight LH, Rimer E, **Ruble J**. (2019). *An Assessment of Potential Roles of a Clinical Pharmacist in Optimizing Health and Athletic Performance of Student Athletes*. College of Pharmacy Doctor of Pharmacy Program Poster Session. University of Utah, Salt Lake City, Utah.

11. Clark L, **Ruble J**. (2018). *UHealth Ombudsman Office: A Resource for Conflict Resolution*. UHealth Resiliency Program – Wellness Champions Poster Session. University of Utah, Salt Lake City, Utah.
10. Raber H, May A, Nyman H, **Ruble J**, Witt D. (2018). *The White Space Project*. UHealth Resiliency Program – Wellness Champions Poster Session. University of Utah, Salt Lake City, Utah.
9. Carr C, Scoville J, Condie C, Davis G, Floyd C, Kelly L, Monson K, Reichert E, **Ruble J**, Hawryluk G. (2018). *A Comparison of Measured pH, Salinity, Osmometry, Nephelometry, and Particulate Matter in Mannitol and Hypertonic Saline [Abstract #41977]*. American Association of Neurological Surgeons (AANS) Annual Meeting, New Orleans, Louisiana.
8. Carr C, Scoville J, Condie C, Davis G, Floyd C, Kelly L, Monson K, Reichert E, **Ruble J**, Hawryluk G. (2018). *An Audit of pH, Salinity, Osmometry, Nephelometry, and Particulate Matter in Commercially Available Hyperosmolar Solutions [Abstract #41971]*. American Association of Neurological Surgeons (AANS) Annual Meeting, New Orleans, Louisiana.
7. Tak CR, Kim J, Gunning K, **Ruble JH**, Sherwin CMT, Nickman NA, Biskupiak J. (2018). *Effect of a Prescription Order Requirement for Pharmacist-Administered Vaccination on Zoster Vaccination Rates*. AMCP Managed Care and Speciality Pharmacy Annual Meeting, Boston, Massachusetts.
6. Bowman N, **Ruble J**, Crouch BI. *Homemade Play-Dough: Money Saving and Potentially Life-Threatening?* North American Congress of Clinical Toxicology. (2016) NACCT Abstracts 2016, Clinical Toxicology, 54:8, 659-811, DOI: 10.1080/15563650.2016.1197486
5. Skrabal MZ, Downs GE, Carter RA, Eagerton DH, Franson KL, Hritcko PM, Jungnickel PW, Kissack JC, **Ruble J**, Torrado C. (2016). *Marijuana Use Task Force (MUTF): Considerations for Schools Regarding Marijuana Use by Students, Faculty, and Preceptors*. American Association of Colleges of Pharmacy Annual Meeting, Anaheim, California.
4. Blumenthal D, Stephens S, Nyman H, Jennings B, **Ruble J**, et al. (2013). *Rapid development and longitudinal incorporation of interprofessional education simulations into the pharmacy curriculum*. American Association of Colleges of Pharmacy Annual Meeting, Chicago, Illinois.
3. **Ruble J**, Edwards D, Schmidt J, et al. (2003). *Medication Use Review: Infliximab use in the ambulatory clinic infusion center at University Health Care*. Report presented to Pharmacy Administration, University of Utah Health Care, Salt Lake City, Utah.
2. **Ruble J**, Constantino T, Godsey C, et al. (1998). *Topiramate (TPM) use in refractory epilepsy patients ineligible for surgical treatment [Abstract #100231]*. American Epilepsy Society 52nd Annual Meeting, Sheraton Convention Center, San Diego, California.

1. Forsheo DA, **Ruble J**, Bromberg MB. (1998). *A survey of ALS/MND specialists for medication preferences for relief of symptoms associated with ALS/MND. Platform Presentation.* The 9th International Symposium on ALS/MND, Park Hilton, Munich, Germany.

EDITORIAL EXPERIENCE

Editorial Board Member

Journal of Pain & Palliative Care Pharmacotherapy

Reviewer Experience

Reviewer for *Journal of Managed Care Pharmacy*, Alexandria, Virginia, USA

Reviewer for *Research in Social and Administrative Pharmacy*, Elsevier, Amsterdam, Netherlands

Reviewer for *Journal of Pain & Palliative Care Pharmacotherapy*, Informa Healthcare USA

Reviewer for *Hospital Pharmacy Journal*, ThomasLand Publishers, St. Louis, Missouri, USA

Reviewer for *Pharmacist's Letter*, Therapeutic Research Center, Stockton, California, USA

Reviewer for *BMC Research Notes*, BioMed Central, London, UK

Reviewer for *Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care, 20th Edition*, Chapter 4: Legal and Regulatory Issues in Self-Care Pharmacy Practice.

PRESENTATIONS

Meeting Presentations

National/Regional/Local

- 11/2018 Ethics in Pharmacy and Law: Practice implications of anti-discrimination standards in MRPC 8.4(g) and ACA section 1557. American Society for Pharmacy Law – Fall Seminar. Hilton Head, South Carolina
- 07/2018 Ethical, Legal, and Social Issues in the Era of Genomic Medicine: How Do We Best Educate Pharmacy Students. Special Presentation, American Association of Colleges of Pharmacy (AACP), AACP Annual Meeting, Boston, Massachusetts
- 04/2018 Opioid Crisis in Utah – Symposium. Center for Law and Biomedical Sciences, SJ Quinney College of Law, University of Utah, Salt Lake City, Utah
- 07/2017 Ethical Dilemmas in Pharmacotherapy – Communication and Conflict Resolution Skills for the Pharmacy Learner Continuum. Special Presentation, American Association of Colleges of Pharmacy (AACP), AACP Annual Meeting, Nashville, Tennessee
- 04/2017 Reducing Risk and Maintaining Empathy: Professional Practice Tips for Risk Management & Strengthening Relationships. Anticoagulation Forum Boot Camp. Los Angeles, California

- 03/2017 Death-With-Dignity: Legal, Ethical, Clinical and Pharmaceutical Perspectives. 18th Annual Conference on Emerging Issues in Healthcare Law, American Bar Association, New Orleans, Louisiana
- 11/2016 Educator's Session – Formative and Summative Assessment in Pharmacy Law Education. American Society for Pharmacy Law – Fall Seminar. Austin, Texas
- 05/2016 Moral Distress and Moral Fatigue in Health Care Professionals. Project ECHO – Burn and Soft Tissue Injury. University of Utah Burn Center. Salt Lake City, Utah
- 01/2016 Reducing Risk and Maintaining Empathy: Professional Practice Tips for Risk Avoidance, Risk Mitigation & Strengthening Relationships. Anticoagulation Forum Boot Camp. Salt Lake City, Utah
- 11/2014 Pharmacy and the Continuum of Lethal Injection. American Society for Pharmacy Law – Fall Seminar. Indian Wells, California
- 11/2014 Educator's Session – Teaching Federal Pharmacy Law. American Society for Pharmacy Law – Fall Seminar. Indian Wells, California
- 10/2014 Prescription Drugs and Poisonings: Exploring the Landscape – Legal Perspective. Utah Poison Control Center 60th Anniversary Symposium. Salt Lake City, Utah
- 11/2013 Compounding Paradigm Shift: A New Regulatory Landscape. American Society for Pharmacy Law – Fall Seminar. Jacksonville, Florida
- 11/2012 Pharmacy Compounding and Meningitis Tragedy Update: What Lessons Can We Learn? Utah Board of Pharmacy, Salt Lake City, Utah
- 09/2010 Criminal Liability for Compounding Errors: A Discussion of Recent Cases. Utah Society of Health System Pharmacists, Annual Meeting, Salt Lake City, Utah
- 07/2009 Is Compounding Illegal or Unethical? A Discussion of Law and Ethics in Pharmaceutical Compounding. University of Utah College of Pharmacy Pharmacotherapy Department Seminar
- 04/2009 Equipose and Clinical Research in an Academic Medicine Environment. University of Utah Health Care, Ethics Committee, Educational Presentation, Salt Lake City, Utah
- 08/2007 Investigational New Drug Applications: Information for Principal Investigators and IRB Panel Members. Institutional Review Board Annual Retreat, University of Utah, Salt Lake City, Utah
- 08/2006 INDA's – Investigational New Drug Applications: An Introduction in 10 Questions. Institutional Review Board Annual Retreat, University of Utah, Salt Lake City, Utah
- 11/1998 Ten Questions (and Answers) About Your Medications for Parkinson's Disease. St. George/Southern Utah Parkinson's Disease Association, Senior Center, St. George, Utah
- 05/1998 Know Your Medications: Ten Questions (and Answers) About Your Medications for Parkinson's Disease. Annual Meeting, Utah Chapter, American Parkinson's Disease Association. Moran Eye Center Auditorium, University of Utah, Salt Lake City, Utah

- 09/1997 Drug Therapies for Neurologic Disorders. 2nd Annual Salt Lake Veterans Affairs Hospital Gerontological Nursing Conference. Wyndham Hotel Convention Center, Salt Lake City, Utah
- 11/1995 Temporal Variation in Pharmacotherapy and the Drug Regulatory Process. Department of Pharmacy Practice, College of Pharmacy, University of Utah, Salt Lake City, Utah

Grand Rounds Presentations and Invited Presentations

- 10/2017 Communication and Conflict Resolution Skills for Pharmacy Professionals. Pharmacy Grand Rounds, Department of Pharmacy Service, University of Utah UHealth, Salt Lake City, Utah
- 10/2016 Assisted Suicide: Implications for Families and Society. Fall Symposium. J. Reuben Clark Law School, Brigham Young University, Provo, Utah
- 09/2016 Keynote Speech: Time and Opportunity. White Coat Ceremony. College of Pharmacy, University of Utah, Salt Lake City, Utah
- 02/2015 Lethal Injection in the United States Criminal Justice System: A Modern Kairos? Hinckley Institute at The University of Utah, Salt Lake City, Utah
- 08/2014 Art Imitating Life – Reflecting on the Fictional World of *Harry Potter* and Realities in Pharmacy and Pharmaceutical Sciences. Eccles Health Sciences Library, University of Utah, Salt Lake City, Utah
- 01/2011 Pharmacist Liability: A Case Study. Grand Rounds, Department of Pharmacy Services, University of Utah Health Care, Salt Lake City, Utah
- 05/2006 Applied Bioethics and Withdrawal of Life-Support in Dying Patients. Grand Rounds, Department of Pharmacy Services, University Health Care, University of Utah, Salt Lake City, Utah
- 11/2003 Fundamentals of Intellectual Property for the Neurologist and Neuroscientist. Grand Rounds, Department of Neurology, University of Utah School of Medicine, Salt Lake City, Utah

Continuing Education Presentations

- 11/2019 Medical Cannabis in Utah: A Primer for Medical Pharmacy Providers (Webinar). Utah Department of Health/University of Utah School of Medicine, Salt Lake City, Utah
- 04/2017 Medical Aid-in-Dying, Pharmacy, Public Policy, and Perspectives. Greater New York Hospital Association, Metropolitan New York City
- 01/2017 Ethical Challenges of Pharmaceuticals in Capital Punishment. Continuing Professional Development Conference for Australian Healthcare Professionals. Canyons Resort, Park City, Utah
- 01/2017 Review and Update of Drug Interactions Commonly Encountered in Patient Care. Continuing Professional Development Conference for Australian Healthcare Professionals. Canyons Resort, Park City, Utah

- 06/2016 Hemophilia Managed Care Review Board – Health Economics and Pharmacoeconomics Assessment – Analyzing Available Data to Assess the Value of Treatment Options and Collaborative Care Management. Web-based Continuing Education Program. Philadelphia, Pennsylvania
- 01/2016 New and Forthcoming Medicines and Pharmaceutical Technologies. Continuing Professional Development Conference for Australian Healthcare Professionals. Canyons Resort, Park City, Utah
- 01/2016 Extemporaneous Compounding Regulations in Australia and the US and Prudent Professional Judgment. Continuing Professional Development Conference for Australian Healthcare Professionals. Canyons Resort, Park City, Utah
- 09/2015 Death With Dignity, Pharmacy and HB 391. Utah Society of Health-System Pharmacists, McKay-Dee Hospital, Ogden, Utah
- 02/2014 Pharmacist Providers: Professional Evolution or Passing Fancy? Utah Therapeutics and Pharmacy Law Continuing Education Program. Roseman University of Health Sciences. Salt Lake City and Logan, Utah
- 09/2013 Compounding Paradigm Shift: Public Policies and Changes in Regulatory Landscape. Utah Society of Health-System Pharmacists, Salt Lake City, Utah
- 08/2013 Hot Potato: A Chronicle of Non-Sterile Compounding. Utah Pharmacists Association, Layton, Utah
- 11/2012 Conflict, Compassion and Communication: Ethical Reasoning in Drug Shortages and Resource Allocation. Greater New York Hospital Association, Metropolitan New York City
- 05/2012 Pharmacy Law Review and Refresher Course. University of Utah College of (annually Pharmacy Continuing Pharmacy Education Program, Health Sciences Education Presented) Building, University of Utah, Salt Lake City, Utah. (Full-day CPE program in Pharmacy Law and Ethics)
- 03/2011 Ethics Panel Discussion: A Continuum of Pharmacy Issues at End-of-Life. Panel participant and moderator. Mid-Winter meeting: Utah Society of Health-System Pharmacists and University of Utah College of Pharmacy. Health Sciences Education Building, University of Utah, Salt Lake City, Utah
- 11/2010 Pharmacist Liability: A Case Study. Department of Pharmacy Services, Intermountain Medical Center. Murray, Utah
- 03/2010 USP <797> -- Planning, Implementation and Enforcement: Successes and Struggles. Southern Nevada Society of Health-System Pharmacists, Mid-year Meeting. Henderson, Nevada
- 02/2010 Pharmacist Liability: A Case Study. Utah Society of Health-System Pharmacists Annual Meeting. Davis Convention Center, Layton, Utah
- 01/2010 Brands, Generics, and Pay-for-Delay: Implications in Patient Care. University of Southern Nevada, Winter CPE Meeting. South Jordan, Utah, and Logan, Utah
- 11/2009 Disclosing a Dispensing Error: Ethical Reasoning. Utah Pharmacists Association, Fall Meeting. Wyndam Hotel and Convention Center, Salt Lake City, Utah

- 05/2009 Complying with Controlled Substances Laws While Maintaining Compassion for Patients. Continuing Education Program, University of Southern Nevada, South Jordan, Utah
- 10/2008 Conflict-of-Interest. Fall Continuing Education Program, University of Utah College of Pharmacy, Salt Lake City, Utah
- 12/2007 Applied Bioethics and Withdrawal of Life-support in Dying Patients. 14th Annual Winter CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 12/2006 Review of Medicare/Medicaid Fraud and Abuse. 13th Annual Winter CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 12/2006 Dealing with Conflict of Interest Ethical Issues. 13th Annual Winter CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 04/2006 Pharmacist Refusal to Dispense: An Overview of Legal and Ethical Issues. Utah Pharmacists Association Annual Meeting, Dixie Center, Saint George, Utah
- 12/2005 Pharmacist Refusal to Dispense: An Overview of Legal and Ethical Issues. Annual Winter CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 12/2004 Negligence Update: Pharmacists Duty to Warn. 11th Annual Winter CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 12/2004 Business Law Primer for Pharmacists. 11th Annual Winter CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 12/2003 Federal and State Administrative Law: FDA, FTC, DEA and State Boards. 10th Annual CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 12/2003 Federal Legislation and Pharmacy Practice Update. 10th Annual Winter CE Program, University of Arizona College of Pharmacy, Park City, Utah
- 10/2003 Navigating Federal Drug Law: 1987-2003: Significant Legislation, Rx-to-OTC switch, Drug Importation. Annual Meeting, Utah Society of Health-System Pharmacists, University of Utah College of Pharmacy, Salt Lake City, Utah
- 04/1999 Medical Assistant In-service Lecture Series: Medication Injections and Commonly Used Oral Medications in the Ambulatory Clinic. Medical Assistants, University of Utah Hospitals & Clinics, Salt Lake City, Utah
- 10/1998 Treatment of Parkinson's Disease: New Tricks and Old Treats. Continuing Education Program, College of Pharmacy, University of Utah, Salt Lake City, Utah

Industrial Presentations

- 05/1998 Parkinson's Disease, Multiple Sclerosis, and Amyotrophic Lateral Sclerosis, Partnership For Care Program, Athena Home Pharmacy Division, Athena Neurosciences, Embassy Suites, South San Francisco, California
- 03/1997 Idiopathic Parkinson's Disease. SmithKline Beecham Pharmaceuticals, Intermountain Sales Team, Chart House Restaurant, Salt Lake City, Utah
- 12/1997 Presenter, Pfizer Inc., Cerebyx: A new advance in seizure control. Paracelsus Family Practice Department, Salt Lake City, Utah

Media Appearances

- 5/2018 “Competition in the Pharmaceutical Industry” *Top of Mind with Julie Rose*. BYU Radio. (aired 6/19/2018) <https://www.byuradio.org/episode/c9d37a75-3db2-4b0b-ad6b-09c36bba5d2d?playhead=3130&autoplay=true>
- 11/2017 “Compounding pharmacies and lethal injection” *VICE News with Gianna Tobani*. VICE Media/HBO. (interview filmed; in production).
- 4/2017 “Opioid Crisis” *Top of Mind with Julie Rose*. BYU Radio. (aired 6/28/2017) <http://www.byuradio.org/episode/e5beffb6-9d27-4077-868b-b1891dd5f6ec?playhead=62&autoplay=true>
- 8/2015 “Printing Pills” *Science Friday with Ira Flatow*. Public Radio International. (aired 8/7/2015) <http://www.sciencefriday.com/segments/venomous-frogs-a-polar-bear-world-record-and-printing-pills/>

PROFESSIONAL ORGANIZATIONS & SERVICE**Professional Organizations**

- 2015 – Present Member, American Society of Health-System Pharmacists (ASHP)
- 2015 – 2017 Member, American Pharmacists Association (APhA)
- 2014 – Present Member, Rho Chi Society – Pharmacy Honor Society
- 2013 – Present Member, American Society for Pharmacy Law (ASPL)
- 2013 – Present Faculty Advisor, National Community Pharmacists Association Chapter
- 2012 – Present Member, American Association of Colleges of Pharmacy (AACP)
- 2004 – Present Admitted to the United States Patent and Trademark Office Bar
- 2002 – Present Admitted to the United States District Court for the District of Utah Bar
- 2002 – Present Member, Utah State Bar Association
- 1996 – Present Member, Utah Society of Health-System Pharmacists
- 1994 – Present Member, Phi Lambda Sigma Pharmacy Leadership Society
- 1990 – 1992 Member, American Pharmacists Association – Academy of Student Pharmacists

Professional Service

- 2016 – 2019 Chair-Elect, Chair, Past Chair, Health Care Ethics Special Interest Group (SIG), American Association of Colleges of Pharmacy
- 2015 – Present Pharmacy Law Educator’s Sub-Committee, American Society for Pharmacy Law (ASPL) Chair, 2015-2017
- 2015 – Present Task Force Member, American Association of Colleges of Pharmacy, AACP Task Force on Marijuana Use by Students, Faculty and Preceptors

- 2010 – 2012 Task Force Member, American Association of Colleges of Pharmacy, AACP Task Force to Evaluate Compounding Instruction in US Pharmaceutical Education
- 2009 – 2011 Board Member-at-Large, Utah Society of Health-System Pharmacists
- 2002 –2004 Co-Chair, Utah Society of Health-System Pharmacists, Newsletter Committee

Public Service

- 2018 – Present Member, Quality Improvement Committee, Wasatch Homeless Health Care, also known as: “4th Street Clinic”, Salt Lake City, Utah
- 2018 – 2022 Chair, Controlled Substances Advisory Committee. Utah Department of Health. State of Utah
- 2013 – Present Pharmacy Compounding Task Force. Utah Board of Pharmacy, Division of Occupational & Professional Licensing, Department of Commerce, State of Utah
- 2013 – 2014 Health Information Workgroup: State of Utah Health Innovation Model Grant. State of Utah Department of Health. Center for Health and Informatics. CFDA 93.624
- 2010 – Present Presenter, Area Health Education Centers, Presented information on pharmacy careers and interactive pharmacy compounding demonstration for Health Careers Summer Camp for Rural Health Scholars Program at Southern Utah University

UNIVERSITY COMMITTEE ACTIVITIES

University Level – University of Utah

- 2017 – 2020 Member, Curriculum Policy Review Board / Special Fee Review Committee
- 2016 – 2019 Member, Faculty Committee on Community and Governmental Relations
- 2006 – 2009 Member, Institutional Review Board

University of Utah Health Care System

- 2007 – 2017 Hospital Ethics Committee
Chair, 2015 – 2017
Co-Chair, 2013 – 2015
Clinical Ethics Consultation Team, 2007 – 2017
- 2009 – 2010 USP <797> Compounding Task Force, Department of Pharmacy Services

College Level – University of Utah College of Pharmacy

- 2018 – Present Member, Learning and Teaching Committee
- 2017 – Present Chair, Curriculum Committee
- 2015 – 2018 Member, Scholastic Standards Committee

2013 – Present	Member, Inter-Professional Education (IPE) Committee
2012 – 2017	Member and P1 Steward, Curriculum Development Committee
2011 – 2014	Member, College of Pharmacy Admissions Committee
2011 – Present	Member, College of Pharmacy Student Mentoring Committee
2009 – 2011	Member, College of Pharmacy Diversity Advisory Committee

CURRENT & PAST AREAS OF TEACHING RESPONSIBILITY

Courses Directed

2017 – 2018	PHARM 5144: Foundations in Drug Information and Critical Inquiry
2015 – 2017, 2020	PHARM 6243: Community Practice (OTC & Self-Care)
2010 – Present	PHARM 6242: Pharmaceutical Compounding and Drug Delivery Systems
2009 – Present	PHARM 5142: Foundations in Pharmacy Law, Ethics, and Risk
2008 – Present	PCTH 7436: Ethical Dilemmas in Pharmacotherapy and Pharmaceutical Sciences

Additional Courses Taught

2011 – 2013	Co-instructor, PHCEU 7975: Journal Club-PhD
2010 – 2015	Co-Instructor, PHARM 5113: Basics in Pharmaceutical Sciences
2009 – Present	Co-Instructor, PHARM 5120: Foundations in Pharmaceutical Sciences
2008 – 2010	Primary Instructor, PCTH 7603: Home Health Clerkship
2004 – Present	Co-Instructor, PHARM 5140: Foundations in Patient-Centered Care
2009 – 2012	Contributor, PCTH 7321: Introduction to Clerkships
2011 – Present	Contributor, PCTH 6500: Research Ethics
2012 – Present	Contributor, PCTH 6890: Research Seminar I
2012 – Present	Contributor, PCTH 7100: Clinical Seminar I

Other Didactic Lectures

2019	Communications, Workplace Conflict and Ombudsman Services. Conflict Resolution Graduate Certificate Program, Department of Communications, University of Utah, Salt Lake City, Utah
2016 – Present	Basal Ganglia and Movement Disorders – Clinical Pharmacology, Medical Students, University of Utah School of Medicine, Salt Lake City, Utah
1998	Pharmacotherapy of Neurological Disorders. Physical Therapy Students. College of Health, University of Utah, Salt Lake City, Utah
1998 – 1999	Medical Assistant In-service Lecture Series: Medication injections and commonly used oral medications in the ambulatory clinic. Medical Assistants, University of Utah Health Care, Salt Lake City, Utah

Department/Division Conferences

- 08/2019 Communication and Conflict Resolution, Department of Family and Preventative Medicine, University of Utah School of Medicine, Salt Lake City, Utah
- 06/2019 Ethical Issues Surrounding Medical Cannabis. Evening Ethics Presentation, Program in Medical Ethics and Humanities. Department of Internal Medicine, University of Utah, Salt Lake City, Utah
- 06/2019 Ethics Training Workshop: Ethics Consultation & Ethics Committees. College of Law, University of Utah, Salt Lake City, Utah
- 05/2019 When Clinicians Disagree: How to speak up when there is a power differential. Internal Medicine Resident Conference. George Whalen Veteran's Affairs Medical Center, and University of Utah Hospital, Salt Lake City, Utah
- 03/2019 Ethical and Legal Perspectives: Responsible pain management in the wake of the opioid crisis. Internal Medicine Resident Conference. George Whalen Veteran's Affairs Medical Center, Salt Lake City, Utah.
- 10/2017 Is an Ethically Appropriate Cost (or Price) Possible for Pharmaceuticals? Evening Ethics Presentation, Division of Medical Ethics and Humanities, Department of Internal Medicine, University of Utah, Salt Lake City, Utah
- 07/2017 Conflict Resolution for Healthcare Professionals. Professional Development Seminar, Department of Pharmacotherapy, College of Pharmacy, Salt Lake City, Utah
- 04/2017 Leadership, Professional Advocacy, and Politics. Career Opportunity Seminar, College of Pharmacy, Salt Lake City, Utah
- 02/2017 Clinical Ethical Reasoning and Decision Making. Internal Medicine Resident Conference. George Whalen Veteran's Affairs Medical Center, Salt Lake City, Utah
- 01/2017 Common Issues for Faculty Visitors to Ombudsman Office. Senior Leadership Conference – Health Sciences Administration, University of Utah Health Sciences, Salt Lake City, Utah
- 11/2011 Communication of Risk in Pharmacotherapy: More Than Just a Four-Letter Word. Department of Pharmacotherapy, College of Pharmacy, University of Utah, Salt Lake City, Utah
- 05/2011 Ethics of High Cost Oncology Drugs: Identifying Victims, Villains, and Values. Department of Pharmacy Services, University of Utah Health Care, Salt Lake City, Utah
- 09/2010 Risk Management and the Lexicon of Pharmacy Practice. Task Force on Future Curricular Revision, College of Pharmacy, University of Utah, Salt Lake City, Utah

- 08/1999 New Antiepileptic Drugs: Advantages and Disadvantages. Clinical Sciences Conference, Department of Neurology, University of Utah, Salt Lake City, Utah
- 08/1998 Pharmacological Treatment of Parkinson's Disease: Current issues and future directions. Clinical Sciences Conference, Department of Neurology, University of Utah, Salt Lake City, Utah
- 05/1997 Antidepressant Selection in Patients with Neurologic Disorders. Clinical Sciences Conference, Department of Neurology, University of Utah. Salt Lake City, Utah
- 06/1997 Botulinum Toxin in Neurologic, Ophthalmologic, and Laryngeal Disorders. Pharmacy Department, University Hospital, Salt Lake City, Utah

Forensic and Legal Consultation / Expert Witness

- 09/2018 **State of Utah.** *In the matter of South Valley Compounding Pharmacy to Practice as a Pharmacy and to Dispense Controlled Substances in the State of Utah* Case No. DOPL 2018-158
- 07/2018 **United States Supreme Court.** Brief amicus curiae of Pharmacy, Medicine, and Health Policy Experts. *Bucklew v. Precythe*, 585 US _____ (2018) (No. 17-8151), [US Supreme Court oral argument scheduled for November 6, 2018]
- 07/2017 **US Federal Court – District of Arizona.** *Guardian News & Media, LLC, et al. v. Charles L. Ryan, et al.*; In the United States District Court for the District of Arizona. Case No. CV-14-02363-PHX-GMS
- 06/2017 **State of Arizona.** *Shannon Coleman, et al. v. Zion's Rx Formulations, LLC, et al.*; In the Superior Court of the State of Arizona, In and For the County of Maricopa. No. CV2015-006403
- 07/2016 **US Federal Court of Appeals – Fifth Circuit.** *Jeffrey Wood, et al. v. Bryan Collier, et al.*; In the United States Court of Appeals for the Fifth Circuit. No. 16-20556
- 05/2016 **US Federal Court – Southern District of Texas.** *Thomas Whitaker, et al. v. Brad Livingston, et al.*; In the United States District Court for the Southern District of Texas, Houston Division. Case No. 4: 13-cv-02901
- 11/2015 **US Federal Court – Eastern District of Virginia.** *Alfredo Prieto v. Harold Clarke, et al.*; In the United States District Court for the Eastern District of Virginia, Alexandria Division. Case No. 1:15cv1258
- 07/2015 **State of Tennessee.** *Stephen M. West, et al. v. Derrick D. Schofield, et al.*; In the Chancery Court of Davidson County, Tennessee. Case No. 13-1627-I

DECLARATION OF JOHN P. WIKSWO, JR., Ph.D

STATE OF TENNESSEE)
)
COUNTY OF WILLIAMSON)
_____)

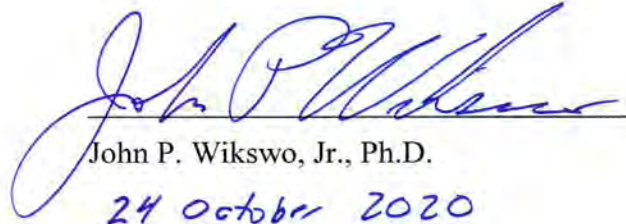
I, John P. Wiksw, Jr., declares and states the following:

1. I hold a Bachelor’s Degree in Physics from the University of Virginia, a Master’s Degree in Physics from Stanford University, and a Ph.D. in Physics from Stanford University. I am the Founding Director of the Vanderbilt Institute for Integrative Biosystems Research and Education, and I am a Professor of Living State Physics, Biomedical Engineering, Molecular Physiology & Biophysics, and Physics. A complete copy of my CV is attached as Exhibit A.
2. I began investigating and considering judicial electrocution protocols and electrocution equipment in 1992. I have continued to do so for the past twenty plus years. I have reviewed the electrocution protocols and equipment of several states, including Tennessee, Alabama, and Nebraska, and I have offered my expert opinions and conclusions regarding their efficacy, potential problems, scientific and technical issues and risks of severe pain. A list of my prior forensic experience is attached as Exhibit B.
3. In addition to my review of the electrocution protocols and equipment described above, I have also reviewed and am familiar with the following:
 - a. scientific literature concerning the application of electrical current to living organisms.
 - b. scientific literature describing the physiological trauma associated with lightning strikes, electrocution in industrial accidents, and electroconvulsive therapy.
 - c. non-scientific material relating, among other things, anecdotal accounts from persons who have come into contact with a high voltage electrical current.
 - d. autopsy reports of electrocuted prisoners.
 - e. statements from persons who witnessed judicial electrocutions of prisoners.
 - f. my own research.
4. If a State’s electrocution protocol and/or equipment is not scientifically sound, a significant number of problems can occur, including:
 - a. Prisoners can remain alive for some period of time during the electrocution event.
 - b. Prisoners can remain conscious and sensate for some period of time during the electrocution event.
 - c. Prisoners can experience excruciating pain and suffering during the event.

- d. Prisoners can suffer thermal burns, extreme bleeding and/or catch fire during the electrocution event.
 - e. Prisoners can remain alive following delivery of the electrical current, resulting in a failed execution or causing death not by electrocution but instead by thermal heating, i.e., cooking of the prisoner's vital organs, and asphyxiation.
 - f. Fires and other accidents in the execution chamber can occur.
5. Attorneys working at Justice 360, a non-profit organization representing death-sentenced inmates in South Carolina, contacted me and asked for my advice and expert opinion regarding one or more upcoming executions in South Carolina, which may be carried out by electrocution.
6. It is my understanding that the South Carolina Department of Corrections has refused to provide any information about the State's electrocution protocol. Without this information, it is impossible for me to assess the risks, efficacy, reliability, and potential scientific or technical problems with the electrocution protocol and equipment. As a result, I am unable to provide an opinion or advice to Justice 360 at this time.
7. In my experience, each State's protocol purports to carry out electrocution somewhat differently. In other words, there is no one specific way that the various states carry out an electrocution. Thus, I cannot simply examine another State's current or past protocol to offer an opinion to Justice 360. Rather, I require access to the specific protocol that the South Carolina Department of Corrections intends to use.
8. In order to provide an expert opinion in this case, I would need to know, at a minimum, the following information:
 - a. The planned current (in Amperes) and voltage (in Volts) of the electrical current during the execution
 - b. The planned duration, and frequency of application of the electrical current during the execution
 - c. The rationale by which the values in (a) and (b) were selected.
 - d. The source of the electrical current
 - e. The electrical resistance of the inmate
 - f. The nature of the electrical connection to the inmate, including what type of electrodes and sponges will be used and the saline content of the solution
 - g. Whether ammeters and voltmeters will be used and, if so, how many, what current and voltage range, at what points along the current, and the procedures for recording the voltages and currents during the execution.
 - h. Whether circuit breakers will be used, and if so, their location in the circuit
 - i. Whether a fire extinguisher and other safety equipment will be available
 - j. What procedures are in place in the event of fire, current failure, a tripped circuit breaker, a blown fuse, or other unexpected event
 - k. Whether there is a backup plan if the execution fails and, if so, what specific steps this plan provides

- l. What testing procedures the Department of Corrections has used to ensure its equipment and protocol is working properly, when the procedure was last tested, what was actually tested, and all data measured and recorded during testing
- m. Autopsy reports and photos of any prior executions carried out by electrocution and the corresponding protocols for each of those electrocutions

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



John P. Wikswo, Jr., Ph.D.
24 October 2020

Curriculum Vitae

JOHN PETER WIKSWO, JR.

September 2020

Vanderbilt Institute for Integrative Biosystems Research and Education
 6301 Stevenson Center
 Vanderbilt University
 Nashville, TN USA 37235
 Phone: (615) 343-4124 Fax: (615) 322-4977
 Email: john.wikswow@vanderbilt.edu
<http://www.vanderbilt.edu/viibre/Wikswow.html>
 ORCID: 0000-0003-2790-1530

FIELDS OF

SPECIALIZATION: Biosystems science and engineering. Biological physics, systems biology, biomedical engineering, cellular instrumentation and control, microfabrication, organs-on-chips, automated biology, cardiac electrophysiology, electromagnetism, and SQUID magnetometry.

DEGREES:

B.A. - Physics, University of Virginia, Charlottesville, VA, 1970
 M.S. - Physics, Stanford University, Stanford, CA, 1973
 Ph.D. - Physics, Stanford University, Stanford, CA, 1975

APPOINTMENTS:

Research Fellow in Cardiology, Stanford University	1975-1977
Assistant Professor of Physics, Vanderbilt University	1977-1982
Associate Professor of Physics, Vanderbilt University	1982-1988
Professor of Physics, with tenure, Vanderbilt University	1988-present
A. B. Learned Professor of Living State Physics, Vanderbilt University	1991-2001
Gordon A. Cain University Professor, Vanderbilt University	2001-present
Professor of Biomedical Engineering, with tenure, Vanderbilt University	2001-present
Professor of Molecular Physiology and Biophysics, with tenure, Vanderbilt University School of Medicine	2001-present
Founding Director, Vanderbilt Institute for Integrative Biosystems Research and Education	2001-present
A. B. Learned Professor of Living State Physics, Vanderbilt University	2005-present
Member, Vanderbilt Ingram Cancer Center	2006-present
Visiting Member, Institute for Advanced Study, Princeton University	2007

HONORS:

Echols Scholar, University of Virginia, 1966-1970
 Phi Beta Kappa, 1968
 Junior Fellow, University of Virginia Society of Fellows, 1969-1970
 B.A. with Highest Distinction, 1970
 Woodrow Wilson Fellow, 1970
 Woodrow Wilson Independent Study Award, 1970
 NSF Predoctoral Fellow 1971-1974
 Student Member, Institute for Electrical and Electronic Engineers, 1975
 Member, Institute for Electrical and Electronic Engineers, 1975-2004
 Bay Area Heart Research Committee Fellow, 1975-1977
 Finalist, Deborah Heart and Lung Foundation Young Investigator Competition, 1980
 Alfred P. Sloan Research Fellow, 1980-1982
 IR-100 Award for Neuromagnetic Current Probe, 1984
 Fellow, American Physical Society, 1990
 John Simon Guggenheim Fellow, 1992-1993

HONORS (continued):

Thomas Jefferson Award, Vanderbilt University, 1997
Fellow, American Institute for Medical and Biological Engineering, 1999
Fellow of the American Heart Association, Fellow of the Council on Basic Cardiovascular Sciences of the American Heart Association, 2001
Fellow, Biomedical Engineering Society (BMES), 2005
Senior Member, Institute for Electrical and Electronic Engineers, 2005-2007
Fellow, Heart Rhythm Society, 2006
The Nightingale Prize 2006 for the best paper published in Medical and Biological Engineering and Computing in 2005
Fellow, Institute for Electrical and Electronic Engineers, 2008
Fellow, American Association for the Advancement of Science (AAAS), 2010
Full Member, Society of Toxicology (SOT), 2016
R&D 100 Award for MultiWell MicroFormulator, 2017

PROFESSIONAL SOCIETIES:

American Association for the Advancement of Science
American Heart Association
American Institute for Medical and Biological Engineering
American Physical Society: Division of Biological Physics, Division of Material Physics; Instrument and Measurement Science Topical Group
American Physiological Society
Biomedical Engineering Society (BMES)
Biophysical Society
Heart Rhythm Society
Institute for Electrical and Electronic Engineers: Engineering in Medicine and Biology Society; Magnetics Society (S'75-M'75-SM'05-F'08)
Sigma Xi (- 2020)
Society for Mathematical Biology
Society of Toxicology
Tennessee Academy of Science
Union of Concerned Scientists

EXTERNAL ACTIVITIES:

Technician, Department of Physics, University of Virginia, 1967-1970
Vice-President, Dexmach, Inc., Palo Alto, CA, 1975-1977
Consultant, David W. Taylor Naval Ship Research and Development Center, Annapolis, MD, 1976-1982
Consultant, Cardiology Division, Stanford University School of Medicine, 1977-1983
Consultant, Cardiac Pacemakers, Inc., Minneapolis, MN, 1985-1988
Director of Undergraduate Studies, Department of Physics and Astronomy, Vanderbilt University, 1985-1989
Advisory Board, National Vibrating Probe Facility, Marine Biological Laboratory, Woods Hole, MA 1986-88
Program Committee (North and South America), Sixth World Conference on Biomagnetism, Tokyo, 1987
International Advisory Committee on Biomagnetism, 1987-1993
Scientific Advisory Board, Hypres, Inc., 1989- (Currently inactive)
Consultant, Marion Merrell Dow, Inc., 1990-1991
Nominating Committee, Division of Biological Physics, American Physical Society, 1991-1992
Executive Board, Learning Community Design Team, Vanderbilt University, 1992-1993
Consultant, Capital Case Resource Center, Nashville, TN, 1992-1994
Consultant, E.I. du Pont de Nemours & Company, 1989-1993
Advisory Board, The Jasper Project, Peabody College for Teachers, Vanderbilt University, 1990-1996
Consultant, Law Office of the Capital Collateral Representative, Tallahassee, FL, 1997-1998

EXTERNAL ACTIVITIES (continued):

Member, NASPE Young Investigators Award Committee, 1999-2002
 Editorial Board, Journal of Applied Physics/Applied Physics Letters, 2000-2002
 Editorial Board, Review of Scientific Instruments, 2000-2003
 Southeastern Section of the American Physical Society Jesse W. Beams Committee, 2001 (Chair)
 Senior Member, Biomedical Engineering Society, 2002-2004
 Program Chair, 2003 Annual Fall Meeting, Biomedical Engineering Society
 Scientific Advisory Board of CardioMag Imaging, Inc., 2003-(Currently inactive)
 Honorary Committee, Max Delbrück Centennial, Cold Spring Harbor, 2006
 External Advisory Board, NIH Center for Bioelectric Field Modeling, Simulation, and Visualization, University of Utah, 1999-2004
 Consultant, Federal Trade Commission, 2003-2007
 External Advisory Board, Center for Integrative Biomedical Computing, University of Utah, 2005-2008
 Scientific Advisory Committee for the Center for Nanophase Materials Science (CNMS), Oak Ridge National Laboratory (ORNL), 2005-2008
 Editorial Board, Experimental Biology and Medicine; Associate Editor for Systems Biology, 2006-2020
 Associate Editor, Biomedical Microdevices, 2010- present
 Member, External Advisory Panel, Portfolio Review, Science & Technology Directorate, Chemical and Biological Defense Division, Department of Homeland Security, Washington, DC, June 17-19, 2013
 Editorial Board, Technology, 2014-present
 Symposium Organizer, "Progress Toward Adoption of Microphysiological Systems in Biology and Medicine," Experimental Biology 2017, Society for Experimental Biology and Medicine, Chicago, IL, April 22-26, 2017
 Inaugural Member, Scientific Advisory Board, BiOasis Technologies Inc., 2017-present
 Plenary Speaker and Session Chair, "Organs on Chips: New Tools for Understanding the Complexities of Biology and Medicine," 8th Annual International Experimental Biology and Medicine Conference, Memphis, TN, October 8-10, 2021

VANDERBILT UNIVERSITY COMMITTEES:

Honors and Individual Programs Committee, College of Arts and Science, 1977-1980
 Radiation Safety Committee, 1978-1981
 Graduate Program Committee, Department of Physics and Astronomy, 1978-1985
 Special Awards Committee, Graduate School, 1979-1981; Chair, 1981
 Ad Hoc Committee on Grievance and Promotion, College of Arts and Science, 1980-1981
 Freshman Advisor, 1981-1983
 College Program Committee: Subcommittee on the Natural Sciences, 1981-1982; Chair, 1982
 Ad Hoc Committee on Promotions and Tenure, College of Arts and Science, 1981-1982
 Vanderbilt University Faculty Senate, 1982-1983, 1984-1985; Chair, External Affairs Committee, 1984-1985
 Co-Director, College of Arts and Science Task Force on Computer-Aided Instruction, 1983-1984
 Ad Hoc Committee to Assess College Computing Needs, 1983-1984
 College Program Committee, 1984-1989
 Ad Hoc Committee on a Special Program for Outstanding Students, College of Arts and Science, 1984-1985
 Phi Beta Kappa Membership Committee, 1984-1987
 College Program Committee Ad Hoc Subcommittee on the Mathematics/Foreign Language Option, 1984-1985
 University Animal Care Committee, 1985-1988
 Undergraduate Curriculum Committee, Department of Physics and astronomy, 1985-1989 (Chair)
 Kenan Venture Fund Committee, College of Arts and Science, 1986-1989
 Operations Committee, Department of Physics and Astronomy, 1986-1988
 College Faculty Council Ad Hoc Committee on the Microcomputer Store, 1987 (Chair)
 Sigma Xi, Vanderbilt Chapter, Admissions Committee, 1987-1988
 College Committee on Admissions, 1990-1991

VANDERBILT UNIVERSITY COMMITTEES (continued):

Faculty Council, College of Arts and Science, 1990-1992
 Ad Hoc Committee on Applied Physics, 1991-1992
 Search Committee for the Chair of the Department of Physics and Astronomy, 1991-1992 (Chair)
 Ad Hoc Committee for an Education Initiative in the Biological Sciences, 1991-1992
 University Patent Review Committee, 1987-1993, (Chair, Writing Subcommittee, 1990-1991; Chair, 1992-1993)
 Executive Committee for the Howard Hughes Undergraduate Biological Science Education Initiative, 1992-1993
 Safety Committee, Department of Physics and Astronomy, 1992-1994
 Advisory Committee on the Stevenson Center, College of Arts and Science, 1993-1994
 Arts and Science Dean Search Committee, 1993-1994 (Chair)
 Committee on Educational Programs, College of Arts and Science, 1994-1995
 Committee for NSF Infrastructure Grant for Distributed Computer Facility, Department of Physics and Astronomy, 1994-1995
 Faculty Council, College of Arts and Science, 1994-1996
 Applied Physics Steering Committee, 1994-1997
 Committee on Computational Science and Engineering, 1996-1997
 Committee on Appointment, Promotion, and Tenure, 1995-1998 (Chair)
 Search Committee for Assistant Professor in Living State Physics, 1998-1999 (Chair)
 Center for Systems and Cognitive Neuroscience Committee, 1998-1999
 Education Committee, Sigma Xi, Vanderbilt University, 1999
 Safety Committee, Department of Physics and Astronomy, 1999
 Strategic Academic Planning Group, Office of the Provost, 1999-2001
 Medical Physics Committee, Department of Physics and Astronomy, 1996-1999
 Committee on Faculty Development and Resources, Department of Physics and Astronomy, 1999-2000
 Technology Review Committee, Vanderbilt University, 1999-2002
 Strategic Academic Plan for the College of Arts and Science (SAPCAS), Chair, Senior Steering Council, 2000-2001
 Executive Committee and Admissions Committee, Chemical and Physical Biology Program, 2002-2007
 Leadership Committee for Development of the Vanderbilt Institute for Environmental Risk and Resources Management, 2001-2005
 Organizing Committee, Conference on Mathematical Models of Signaling Systems, Vanderbilt University Division of Continuing Medical Education, 2004
 Executive Committee, Department of Physics and Astronomy, 1999-2001; 2002-2004
 Shop Committee, Department of Physics and Astronomy, 1985-2005; 2011-present (Chair, 1985-1990, 2011-present)
 Ad Hoc Research Institute and Centers Council (RICC), School of Engineering, 2005-2007
 Internal Advisory Board, Center for Structural Biology, 2004-2012
 STOP Task Force, 2005-2008
 Organizing Committee, Max Delbrück Vanderbilt Centenary Celebration, 2006 (Chair)
 Life Sciences Modeling Committee, 2006-2007
 School of Engineering Dean's Consultative Committee on Promotion and Tenure, 2003-2006
 Executive Advisory Committee, Chemical and Physical Biology Program, 2007-2012
 Biological Physics Search Committee, Department of Physics & Astronomy, 2009-2010, 2010-2011
 Faculty Search Committee, Department of Biomedical Engineering, 2009-2010
 Vanderbilt University Faculty Senate, Academic Policies & Services Committee, 2011-2013
 Stevenson Chair Search Committee, Department of Physics & Astronomy, 2011-
 Long Range Planning Committee, Department of Physics & Astronomy, 2012-2015; 2019-2020
 Faculty Advisory Committee for the Vanderbilt Center for Technology Transfer and Commercialization, 2013-present

PRIOR SUPPORT:

1. Vanderbilt/NIH Biomedical Support Grant, "Superconducting Differential Magnetometer," 1976, \$26,200
2. Research Corporation, "Measurement of Cellular Magnetic Fields," 1977-1978, \$13,100
3. Vanderbilt University Research Council, "Implementation of the Stanford Signal Processing System," 1977, \$2,840
4. Vanderbilt Natural Science Committee, "Computer Terminal," 1978, \$2,500
5. Vanderbilt University Research Council, "Measurement of Cellular Magnetic Fields," 1978, \$2,300
6. Tennessee Heart Association, "ECG Changes Due to Infarction in Isolated Dog Hearts," 1978-1980, \$15,000
7. NSF/Vanderbilt, "An Advanced Undergraduate Laboratory in Living State Physics," 1978-1980, \$28,900
8. Vanderbilt Natural Science Committee, "Instrumentation," 1978, \$3,020
9. Vanderbilt/NIH Biomedical Support Grant, "Computer Graphics Terminal," 1978, \$4,500
10. Vanderbilt University Research Council, "Measurement and Modeling of Cellular Magnetic Fields," 1979, \$1,850
11. Stanford/NIH/NASA, "Development of the OSCOPE Signal Processing System," 1979-1981, \$23,030
12. Alfred P. Sloan Research Fellowship, 1980-1982, \$20,000
13. Vanderbilt University Research Council, "Improvements to a SQUID Magnetometer," 1980, \$3,130
14. Vanderbilt Natural Science Committee, "Fluxgate Magnetometer for the Low-Field Facility," 1980, \$1,480
15. ONR, "Biomagnetic Measurements of the Squid Axon," 1980-1982, \$10,750
16. Vanderbilt Natural Science Committee, "Instrumentation," 1981, \$1,990
17. ONR, "Magnetic Measurements of Cardiac Action Currents: The Effects of Hypothermia and Other Interventions," 1982-1985, \$256,462
18. Vanderbilt University Research Council, "Professional Development Grant for Participation in NATO Institute, Frascati," 1982, \$600
19. Vanderbilt University Research Council, "Development of Instruments for Measurements of Electrical Properties of Living Cells," 1982, \$3,000
20. Vanderbilt Natural Science Committee, "Electronic Test Equipment," 1982, \$2,460
21. Vanderbilt University Research Council, "University Research Fellowship," 1983-1984, \$7,500
22. Palo Alto Veterans Administration Medical Center, project under "Towards Better Methods of Nerve Repair and Evaluation," 1983-1984, \$30,000
23. NIH, "Magnetic Measurement of Peripheral Nerve Function," 1983-1986, \$423,030 total direct costs, \$635,517 total costs
24. Vanderbilt Natural Science Committee, "Purchase of Computer-Aided Design Software," 1983, \$1,900
25. Vanderbilt Natural Science Committee, "Purchase of Drafting Equipment," 1984, \$250
26. Vanderbilt/NIH Biomedical Support Grant, "Research Associate Support," 1984-85, \$9,819
27. Vanderbilt/NIH Biomedical Support Grant, "Digital Oscilloscope," 1985, \$9,680
28. Cardiac Pacemakers, Inc., "Biophysical Approaches to Defibrillation," 1985-1987, \$67,224
29. Vanderbilt Kenan Venture Fund, "Physics Homework Problem Software," 1985, \$7,550
30. NIH, project under "*In Vivo* Actions of Anti-Arrhythmic Drugs," D.M. Roden, PI, 1986-1991, \$71,180

PRIOR SUPPORT (continued):

31. Vanderbilt/NIH Biomedical Research Support Grant, "Purchase of Dynamic Signal Analyzer," 1986, \$8,535
32. NIH, "Magnetic Measurement of Peripheral Nerve Function," 1986-1991, \$777,041 direct costs, \$1,197,729 total costs
33. ONR/Vanderbilt, "High-Resolution SQUID Magnetometer Facility," 1986-1988, \$144,445
34. Vanderbilt Natural Science Committee, "Data Acquisition System," 1986, \$1,750
35. NIH, "Action Currents and Skeletal Muscle Electrophysiology," 1987-1993, \$760,203
36. AFOSR, "Magnetic Mapping of Current Distributions in Two-Dimensional Electronic Devices," 1987-1990, \$530,282
37. Vanderbilt/NIH Biomedical Research Support Grant, "Purchase of SQUID Magnetometer for Mapping Cardiac Activation Currents," 1987, \$10,000
38. Vanderbilt/NIH Small Instrumentation Program, "Purchase of 24-Channel Data Acquisition System," 1987, \$13,130
39. NIH, Administrative Supplement to "Magnetic Measurement of Peripheral Nerve Function," towards purchase of High Resolution SQUID Magnetometer, 1987, \$15,000
40. Vanderbilt Natural Science Committee, "Low Noise Preamplifiers," 1987, \$2,500
41. Vanderbilt/NIH Biomedical Research Support Grant, "Purchase of Magnetic Shield for SQUID Magnetometer for Mapping Cellular Action Currents," 1988, \$7,340
42. Vanderbilt Kenan Venture Fund, "Development of an Intermediate Physics Laboratory," (with M.S. Webster), 1988-1989, \$4,010
43. W.M. Keck Foundation and Vanderbilt University, "Construction of New Living State Physics Laboratories," 1988-1989, \$850,000
44. Vanderbilt Natural Science Committee, "Magnetic Shield for SQUID Magnetometer," 1988, \$2,875
45. Vanderbilt/NIH Small Instrumentation Program, "Purchase of an Intraoperative Data Acquisition System," 1989, \$14,460
46. Vanderbilt Natural Science Committee, "High Input Impedance Electrometer," 1989, \$3,000
47. Vanderbilt Kenan Venture Fund, "Development of a Course in the Physics of Technology," 1989, \$26,625
48. Electric Power Research Institute and Island Hill Research, "SQUID for NDE," 1989-1990, \$50,000
49. Vanderbilt/NIH Biomedical Research Support Grant, "Small Animal Ventilator," 1990, \$1,950
50. Biomagnetic Technologies, Inc. and AFOSR, "Design Studies for a High Resolution, Linear Magnetometer Array for NDE," 1990, \$6,000
51. Vanderbilt Natural Science Committee, "Gaussmeter," 1990, \$4,985
52. AFOSR, "High Resolution SQUID Magnetometry for Non-Destructive Evaluation," 1990-1993, \$221,960 total costs
53. Vanderbilt Natural Science Committee, "System for Measuring Transmembrane Action Potentials," 1991, \$1,800
54. General Electric, "Evaluation of SQUID NDE," 1991, \$40,000
55. University of Maryland, "Development of NanoSQUID," 1991-1992, \$50,950
56. Air Force Office of Scientific Research, "EEG/MEG Workshop," 1992, \$16,952
57. Lockheed, "SQUID NDE Techniques for Aircraft Corrosion," 1992-1993, \$27,363
58. Vanderbilt/NIH Small Instrumentation Program, "Purchase of a Parallel Processor for SUN Workstation," 1991, \$5,419

PRIOR SUPPORT (continued):

59. E. I. duPont de Nemours & Company, "SQUID-Based Magnetic Susceptometer," 1991, \$400,000
60. Sun Microsystems, Inc., "A Networked Computer Environment for Living State Physics," 1992, \$63,760
61. John Simon Guggenheim Memorial Foundation, "Magnetic Imaging of Biological, Superconducting, and Structural Systems," 1992-1993, \$27,000
62. Vanderbilt Natural Science Committee, "Nerve Translation Stage," 1992-1993, \$2,502
63. NIH, "Magnetic Measurement of Peripheral Nerve Function," 1991-1994, \$2,739,005
64. E. I. duPont de Nemours & Company, "Magnetic Field Measurements," 1990-1993, \$465,000
65. Electric Power Research Institute, "SQUID for NDE II," 1991-1995, \$636,934
66. Joan Porter, "Magnetically Shielded Room," 1993, \$20,000
67. Vanderbilt University, "Magnetically Shielded Room," 1993, \$45,000
68. AFOSR/URI, "Advanced Instrumentation and Measurements for Early Nondestructive Evaluation of Damage and Defects in Aerostructures and Aging Aircraft," 1993-1998, with James Cadzow, Thomas Cruse, George Hahn, and Barry Lichter, \$990,573
69. Veterans Administration, "Biomagnetic Activity of Ischemic Alimentary Tract Smooth Muscle," William O. Richards, PI, 1994-1996, Subcontract to Physics: \$59,000
70. Alcoa, "SQUID NDE of Aluminum," 1996, \$15,000
71. NIH, project under "Mechanisms of Antiarrhythmic Drug Action," Program Project Grant, D.M. Roden, PI, 1992-1997, \$732,580
72. Vanderbilt/Provost's Initiative on Team-Teaching, "Introduction to Applied Physics," 1993 with T. Wang, R.A. Weller, and R.F. Haglund, \$20,850, \$-0- to Living State Physics
73. Fishery Technology Center, University of Alaska, "SQUID Measurements," 1993, \$3,000
74. Conductus/NIH, "Magnetometry for Early Detection of Intestinal Ischemia," 1994, \$24,924
75. NSF/Vanderbilt University, "A Distributed Computer Facility for Physics and Education," \$357,000, David J. Ernst, PI, 1994-1995, \$28,000 to Living State Physics
76. AFOSR/AASERT, "High Resolution SQUID Magnetometry for Non-Destructive Testing," 1994-1997, \$149,451
77. Vanderbilt Venture Fund Committee, "Demonstration Equipment for Physics of Technology Course," 1995-1996, \$2,000
78. Fishery Technology Center, University of Alaska, "SQUID Magnetometers for the Detection of Fish Parasites," 1996-1997, \$23,500
79. NSF, "High Resolution SQUID Magnetometer for Imaging Biological Systems," 1996-1997, \$121,687
80. NIH/Hypres, Inc., "Ultra-High Resolution SQUID Magnetometers for Biological Research," 1996-1997, \$40,000
81. NCI, Inc., "SQUID Magnetometer for Quantification of Aircraft Corrosion," 1996-1997, \$82,530
82. NIH/Conductus, Inc., "Magnetometry for Early Detection of Intestinal Ischemia," 1996-1997, \$83,768
83. EPRI/Ontario Hydro, "SQUID Magnetometers for Assessing Insulator Aging," 1996-1998, \$45,000
84. Veterans Administration, "Biomagnetic Activity of Ischemic Alimentary Smooth Muscle," 1996-1998, \$25,000
85. German Ministry of Research (BMBF) through KFA/Rohmann GmbH, "SQUID Measurement, Analysis and Pattern Recognition Tool," 1997-1998, \$65,424
86. NIH, "Electrophysiological Implications of the Cardiac Bidomain," 1997-2008, \$3,200,000
87. NSF, "High Resolution SQUID Magnetometer for Imaging Biological Systems," 1997-2000, \$299,015

PRIOR SUPPORT (continued):

88. Du Pont/Physical Research, Inc., "Real-Time Magneto-Optic Non-Destructive Inspection of Tagged Composites," 1998-1999, \$45,000
89. Veterans Administration, "Biomagnetic Activity of Ischemic Alimentary Smooth Muscle," 1998-2000, \$50,000
90. NIH/Hypres, Inc., "Digital SQUID Fetal Magnetocardiography," 1999-2000, \$84,999
91. USAF/NCI, "Corrosion Studies at Robins AFB," 1999-2000, \$219,801
92. AFOSR/Tristan Technologies, Inc., "Cryocooled SQUID Magnetometer Array for Laboratory Measurement of the Rate of Hidden Corrosion in Aging Aircraft," 1999-2000, \$30,000
93. Trustees of the Bowling-Pfizer Heart Valve, "Electromagnetic Detection of Outlet Strut Fracture in the Bjork-Shiley Heart Valve," 1999-2000, \$394,275
94. USAF/NCI, "Corrosion Fatigue and Corrosion Predictive Modeling," 1999-2000, \$131,645
95. USAF/NCI, "Corrosion Studies at Robins AFB," 2000-2000, \$12,588
96. Veterans Administration, "Biomagnetic Activity of Ischemic Alimentary Smooth Muscle," 2000-2001, \$50,000
97. NASA/Magnesensors, Inc., "Quantitative Non-Destructive Evaluation of Aging Aircraft Using New High-Temperature SQUID Sensors," 2000-2001, \$69,813
98. AFOSR/S&K, Inc., "Corrosion Studies at Robins AFB," 2000-2001, \$125,877
99. NIH/Hypres, Inc., "Ultra-High Resolution SQUID Magnetometer," 2000-2003, \$224,769 (Franz Baudenbacher, PI)
100. Vanderbilt, Natural Science Committee, "Shared Portable Residual Gas Analyzer and Vacuum System," 2001, \$10,281
101. NIH/Hypres, Inc., "Micromachined Biocalorimeter with Picojoule Sensitivity," 2001-2003, \$66,600 (Franz Baudenbacher, PI)
102. Vanderbilt University Academic Venture Capital Fund, "The Vanderbilt Institute for Integrative Biosystems Research and Education," 2001-2009, \$5,150,562
103. AFOSR/Tristan Technologies, Inc., "Cryocooled SQUID Magnetometer Arrays for Laboratory Measurement of the Rate of Hidden Corrosion in Aging Aircraft," 2001-2004, \$161,773
104. DARPA, "Massively Parallel, Multi-Phasic Cellular Biological Activity Detector (MP2-CBAD)," 2001-2005, \$1,934,298
105. AFRL-S&K, Inc., "SQUID Measurements to Determine the Effects of Maintenance and Environment on Intergranular Corrosion," 2002-2003, \$101,064
106. NIH, "Biomagnetic Signals of Intestinal Ischemia," 2002-2006, \$1,261,545 (William Richards, PI)
107. AFOSR/S&K, Inc., "Corrosion Studies at Robins AFB," 2002, \$100,000
108. Whitaker Foundation, "Instrumenting and Controlling the Single Cell: An Educational Program in Biomedical Engineering," 2003-2007, \$999,948
109. DARPA, "High Resolution Multimodal Imaging of Neuronal Circuits in Hippocampal Slices," 2003-2005, \$350,000 (Franz Baudenbacher, PI)
110. NIH, "Characterizing MRI Parameters of Iron-Loaded Tissues," 2003-2006, \$749,390 (Mark Does, PI)
111. Pria Diagnostics, "Nanoprobes for Dynamic Clinical Diagnosis," 2004-2007, \$135,000
112. AFOSR/DARPA, "Correlations Between Single-Cell Signaling Dynamics and Protein Expressions Profiles," 2004-2005, \$199,842
113. VU Discovery Grant, "Development of a Planar Perfusion System for In-Vitro Tissue Microenvironments," 2004-2007, \$99,988

PRIOR SUPPORT (continued):

114. NIH/NCI, "Multiscale Mathematical Modeling of Cancer Invasion," 2004-2009, \$2,317,144 (Vito Quaranta, PI)
115. AFOSR/DARPA, "Nanoprobes for Sensing and Controlling Cellular Signaling," 2005-2006, \$624,383
116. DOD/DARPA, "SPARTAN: Single-Protein Actuation by Real-Time Transduction of Affinity in Nanospace," 2007-2008, \$1,308,814
117. NSF, "IDBR: EcoChip: A Microfluidic Device to Characterize Microbial Responses to Habitat Structure," 2007-2009, \$398,910 + \$33,125 REU (Leslie Shor, PI)
118. NIH/NIAID, "Metabolic Discrimination of Unknown Bacterial Pathogens," 2005-2010, \$5,476,851
119. NSF, "MRI: Development of a Nanoparticle Trap for Student Training," 2006-2010, \$546,897 (Inherited from Tobias Hertel August 1, 2008))
120. DOD/BCRP, "Thick Matrix Capillary-Perfused Bioreactor for Studying Angiogenesis and Metastasis in Breast Cancer," 2007-2011, \$776,668
121. VU Discovery Grant, "Nanotechnology-Based Microfluidic Biomarker Sensor," 2008-2011, \$100,000 (Todd Giorgio, PI)
122. National Academies Keck Future Initiatives, "Biology on Demand: External Control of a Complex Cellular System, *S. cerevisiae*," 2009-2011, \$50,000
123. NIH/NHLBI, "Correlative Multimodal Imaging of Cardiac Electrophysiology and Metabolism," 2009-2011, \$1,106,413 (John Wiksw, Franz Baudenbacher, Veniamin Sidorov, and Richard Gray, PIs)
124. NIH/NIDA, "Elucidation of Leukocyte and Macrophage Biomarker Signatures from Drugs of Abuse," 2009-2011, \$2,661,005, (Multi-PI: John McLean, John Wiksw, Hod Lipson)
125. FDA, "Develop and Build Transconductance Amplifiers for Defibrillation Research," 2010-2011, \$42,110
126. NIH, "Automated Microscope for Long-Duration, Quantitative Dynamic Imaging," 2010-2012, \$500,000, 2010-2012
127. EMD Millipore Corporation, "The EMD Millipore Research Associate in Automated Systems Biology," 2011-2012, \$85,565
128. Defense Threat Reduction Agency, "Automated Characterization of the Interaction Dynamics between Toxic Chemicals and Biological Agents and Biomolecules and Cells of Blood and Lymph," 2009-2014, \$2,499,763
129. NIH/NCI, "Ephrin A-1 Tumor-Endothelial Interaction During Metastasis," 2008-2014, \$192,569 (Jin Chen, PI)
130. Vanderbilt University Discovery Grant Program, "Molecular Effects of Maternal Immune Activation: The Story of Placental, Glial, and Neuronal Interactions," 2012-2014, \$50,000
131. NIH, "Skin Regeneration with Stem Cells and Scaffolds," 2009-2014 (Jeffrey Davidson, PI), \$419,317
132. DARPA, "Integrated Human Organ-on-Chip Microphysiological Systems," 2012-2015 (Donald Ingber, Harvard University, PI), \$1,328,789 subcontract to Wiksw
133. Defense Threat Reduction Agency, "Integration of Novel Technologies for Organ Development and Rapid Assessment of Medical Countermeasures (INTO-RAM)," 2012-2014 (Rashi Iyer, Los Alamos National Laboratory, PI), \$3,599,673 subcontract to Wiksw
134. NSF, "MRI: Development of Advanced Multiplexed Structural Mass Spectrometer for Research and Training," 2012-2015 (John McLean, PI), \$500,822
135. AstraZeneca Research Agreement, "Development and Application of MicroFormulators for MicroPhysiological Systems Research," 2015-2016, \$100,000

PRIOR SUPPORT (continued):

136. NIH/NCATS, “SmartPlate Technology for Advanced Cell-Based Models (STAC-M),” Phase I SBIR, 2016-2017 (Kapil Pant, CFD Research Corporation, PI), \$59,000 (subcontract to Wikswow)
137. NIH/NCATS, “A Tissue Engineered Human Kidney Microphysiological System,” 2014-2017 (Jonathan Himmelfarb, University of Washington, PI), \$182,500 (subcontract to Wikswow)
138. NIH/NCATS, “Translational Center of Tissue Chip Technologies for Quantitative Characterization of Microphysiological Systems,” 2016-2017 (Murat Cirit, Massachusetts Institute of Technology, PI), \$270,475 (subcontract to Wikswow)
139. NIH/NCATS, “Neurovascular Unit on a Chip: Regional Chemical Communication, Drug and Toxin Responses,” 2012-2017 (Multi-PI: John P. Wikswow (Lead); Chaitali Ghosh (Cleveland Clinic) and Damir Janigro (Flocel Inc.), \$5,362,719; no-cost extension through 6/30/2018
Five administrative supplements were awarded under the parent grant:
 - a. “Inner Blood-Retinal Barrier-on-a-Chip: Implications for Ocular Disease,” 2013-2014, \$145,500
 - b. “Drug-Device Interactions in Microphysiological Systems (MPS): Development of Analytical Techniques and Selection of Materials and Surface Modifications,” 2015-2016, \$137,051 (no-cost extension through 6/30/2018)
 - c. “Oncology-on-Chip: Extending Neurovascular Unit Functionality to Study Breast-to-Brain Metastasis,” 2015-2016, \$235,494 (no-cost extension through 6/30/2018)
 - d. “A Missing Endocrine Organ-System MicroFormulator for Coupled Organs-on-Chips,” 2016-2017, \$72,800; no-cost extension through 6/30/2018
 - e. “Neurovascular Unit on a Chip as a Model System for Tuberous Sclerosis Complex,” 2016-2017, \$156,014; no-cost extension through 6/30/2018
140. NIH/NCATS, “A 3D Biomimetic Liver Sinusoid Construct for Predicting Physiology and Toxicity,” 2014-2017 (Lansing Taylor, University of Pittsburgh, PI), \$243,750 (subcontract to Wikswow); no-cost extension through 6/30/2018
141. NIH/NHLBI R01HL118392, “Optimal Design of Challenge-Response Experiments in Cardiac Electrophysiology,” PI: Matthew Shotwell; 2013-2018, \$221,069 (to Wikswow).
142. DTRA CBMXCEL-XL1-2-001, “Assessment of Infection Induced Inflammation in the Blood”, PI: Srinivas Iyer (Los Alamos National Laboratory); Subaward 468746: “Development of Neurovascular Unit,” 2017-2018, \$528,000 (to Wikswow).
143. IARPA 2017-17081500003, “Neural Microphysiological System for Time Dependent Phenomics of C/B Neurotoxins,” PIs: David E. Clifffel, John A. McLean, John P. Wikswow; 2017-2018, \$330,000 (to Wikswow).
144. AstraZeneca Research Agreement, “Development and Application of MicroFormulators for MicroPhysiological Systems Research,” PI: John P. Wikswow; 2017-2018, \$100,000.
145. CASIS GA-2016-236, “A Microphysiological 3D Organotypic Culture System for Studying Degradation and Repair of Composite Skeletal Tissues in a Microgravity Environment,” PI: Rocky Tuan (University of Pittsburgh); 2016-2019 (no-cost extension), \$102,000 (subcontract to Wikswow).
146. NIH/NCATS 3UG3TR002097-02S1, Administrative Supplement for Tissue Chip Consortium Awardees: Development of Tissue Chips to Model Nociception, Opioid Addiction and Overdose, PI: John P. Wikswow; 2018-2019, \$261,603.
147. Eli Lilly and Company, “Applications of Microphysiological Systems for Drug Disposition, Metabolism, Pharmacodynamics, and Toxicology in Drug Development,” PI: John P. Wikswow; 2017-2019, \$228,200.
148. EPA 83573601, “Vanderbilt-Pittsburgh Resource for Organotypic Models for Predictive Toxicology (VPROMPT),” PI: Shane Hutson; 2014-2019 (no-cost extension), \$1,299,384 (to Wikswow).

PRIOR SUPPORT (continued):

149. NIH/NCI U01CA202229, “Physical Dynamics of Cancer Response to Chemotherapy in 3D Microenvironments,” Multi-PI: Lisa J. McCawley (Lead), Dmitry A. Markov, Katarzyna Anna Rejniak; 2015-2020, \$129,960 (to Wikswow).
150. NIH/NCATS HHSN271201700044C, “SmartPlate Technology for Advanced Cell-Based Models (STAC-M),” Phase II SBIR, PI: Kapil Pant (CFD Research Corporation); 2017-2019, \$600,000 (subcontract to Wikswow); no-cost extension to 2020.

CURRENT SUPPORT:

1. Gift of Gideon Searle, “Systems Biology and Bioengineering Undergraduate Research Experience (SyBBURE),” PI: John P. Wikswow; 2006-2016, \$3,470,045; 2017-2018, \$525,000; 2018-2026, \$668,500 direct costs pledged annually.
2. NSF CBET-1706155, “High Throughput Screening of iPSC Differentiation to Subtype-Specific Dopaminergic Neurons Using a Novel Microfluidic Platform,” PIs: Ethan S. Lippmann, John P. Wikswow; 2017-2020, \$300,000; no-cost extension to 2021.
3. NIH/NCATS 5UL1TR002243-03, “Vanderbilt Institute for Clinical and Translational Research (VICTR),” PI: Gordon R. Bernard (Vanderbilt University Medical Center); 2017-2022, \$152,078 (total VU subaward).
4. DOD/DARPA W911NF-14-2-0022, “Chemical Threat Assessment by Rapid Molecular Phenotyping,” PI: Richard Caprioli; 2014-2018 and 2019-2021, \$1,014,625 (total grant).
5. NIH/NCATS 5U01TR002383-03, “Harnessing Human Brain and Liver Microphysiological Systems for Testing Therapeutics for Metastatic Melanoma,” Multi-PI: John P. Wikswow (Lead), D. Lansing Taylor, William L. Murphy; 2018-2023, \$7,642,688.
6. NIH/NCATS/NINDS/NICHHD 5UH3TR002097-04, “Drug Development for Tuberous Sclerosis Complex and Other Pediatric Epileptogenic Diseases Using Neurovascular and Cardiac Microphysiological Models,” Multi-PI: John P. Wikswow (Lead), Kevin C. Ess, M. Diana Neely; 2017-2022, \$5,648,618 (not including completed administrative supplement 3UG3TR002097-02S1).
7. NASA 80NSSC20K0108, “An automated, instrumented evaluation platform for validating the performance of a novel, integrated microfluidic pump and valve experiment control system for tissue-chips-in-space and chemical mixing experiments in microgravity,” PI: John P. Wikswow; 2019-2021, \$300,000.
8. NIH/NCI 2R01CA116021-16, “New Strategies for Treatment of NRAS Mutant Melanoma after Progression on Immune Checkpoint Inhibitors,” PI: Ann Richmond; 2020-2025, \$7,712 (to Wikswow).
9. NIH/NICHHD 1R01HD102752-01, “Instrumenting the Fetal Membrane on a Chip,” PI: David E. Cliffler; 2020-2024, \$2,588,157 (total grant).
10. Chalmers University of Technology, “Development of Prototype Well-Plate Chemostats for the Genesis Robt,” PI: John P. Wikswow; 2020-2021, \$100,000.
11. NIH/NCATS 3UH3TR002097-04S1, “Fighting the Cytokine Storm of COVID-19 using MicroPhysiological Systems,” Emergency Competitive Revisions to Existing NIH Grants and Cooperative Agreements for Tissue Chips Research on the 2019 Novel Coronavirus, PI: John P. Wikswow, 2020-2021, \$1,142,940.

PUBLICATIONS:

Peer-Reviewed Journal Articles

1. "Quantized Fluctuations in the Josephson Oscillations of a Shunted Superconducting Point Contact," R.D. Sandell, J.P. Wikswo, Jr., J.M. Pickler, and B.S. Deaver, Jr., J. Appl. Phys., 44: 3312-3318 (1973).
2. "Consistent System of Rectangular and Spherical Coordinates for Electrocardiography and Magnetocardiography," J.A.V. Malmivuo, J.P. Wikswo, Jr., W.H. Barry, D.C. Harrison, and W.M. Fairbank, Med. Biol. Eng. and Comput., 15: 413-415 (1977).
3. "A New Practical Lead System for Vector Magnetocardiography," J.A.V. Malmivuo and J.P. Wikswo, Jr., Proc. IEEE, 65: 809-811 (1977).
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8. "Magnetic Field of a Nerve Impulse: First Measurements," J.P. Wikswo, Jr., J.P. Barach, and J.A. Freeman, Science, 208: 53-55 (1980).
9. "An Estimate of the Steady Magnetic Field Strength Required to Influence Nerve Conduction," J.P. Wikswo, Jr. and J.P. Barach, IEEE Trans. Biomed. Eng., BME-27: 722-723 (1980).
10. "Experiments on the Magnetic Field of Nerve Action Potentials," J.P. Barach, J.A. Freeman and J.P. Wikswo, Jr., J. Appl. Phys., 51: 4532-4538 (1980).
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12. "Quark Chemistry," L.J. Schaad, B.A. Hess, J.P. Wikswo, Jr., and W.M. Fairbank, Phys. Rev. A, 23: 1600-1607 (1981).
13. "Sequential QRS Vector Subtractions in Acute Myocardial Infarction in Humans," J.P. Wikswo, Jr., S.C. Gundersen, W. Murphy, A.K. Dawson, and R.F. Smith, Circ. Res., 49: 1055-1062 (1981).
14. "Possible Sources of New Information in the Magnetocardiogram," J.P. Wikswo, Jr. and J.P. Barach, J. Theoretical Biol., 95: 721-729 (1982).
15. "Improved Instrumentation for Measuring the Magnetic Field of Cellular Action Currents," J.P. Wikswo, Jr., Rev. Sci. Instr., 53: 1846-1850 (1982).
16. "A Low-Noise, Low Input Impedance Amplifier for Magnetic Measurements of Nerve Action Currents," J.P. Wikswo, Jr., P.C. Samson, and R.P. Giffard, IEEE Trans. Biomed. Eng., BME-30: 215-221 (1983).
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18. "A Comparison of Scalar Multipole Expansions," J.P. Wikswo, Jr. and K.R. Swinney, J. Appl. Phys., 56: 3039-3049 (1984).
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24. "Optimisation of State Selection and Focusing of a Neutral Atomic Hydrogen Beam by a Hexapole Magnet," D.P. Russell and J.P. Wiksw, Jr., J. Physics E, 18: 933-940 (1985).
25. "The Magnetic Field of a Single Nerve Axon: A Volume Conductor Model," J.K. Woosley, B.J. Roth, and J.P. Wiksw, Jr., Mathematical Biosciences, 76: 1-36 (1985).
26. "The Electrical Potential and the Magnetic Field of an Axon in a Nerve Bundle," B.J. Roth and J.P. Wiksw, Jr., Mathematical Biosciences, 76: 37-57 (1985).
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32. "Electric and Magnetic Fields from Two-Dimensional Anisotropic Bisyncytia," N.G. Sepulveda and J.P. Wiksw, Jr., Biophys. J., 51: 557-568 (1987).
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39. "Current Injection into a Two-Dimensional Anisotropic Bidomain," N.G. Sepulveda, B.J. Roth, and J.P. Wiksw, Jr., Biophys. J., 55: 987-999 (1989).
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42. "The Magnetic Field of Cortical Current Sources: The Application of a Spatial Filtering Model to the Forward and Inverse Problems," S. Tan, B.J. Roth, and J.P. Wiksw, Jr., Electroenceph. Clin. Neurophys., 76: 73-85 (1990).
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Licensed Technology

1. Agilent Technologies, a public research, development, and manufacturing company with headquarters in Santa Clara, CA, has a non-exclusive license to several of VIIBRE's devices to monitor the status of cells (US 7,435,578, US 7,704,745, US 7,713,733, and US 7,981,649).
2. KIYATEC Inc., a Greenville, SC company that specializes in providing advanced, three-dimensional, cell-based assays and diagnostics with superior physiologic relevance for more accurate ex vivo prediction of patient response to drugs, has licensed the novel, miniaturized peristaltic pump and valve technologies developed by VIIBRE as part of its organ-on-chip research and development program. KIYATEC has successfully developed and manufactured prototype pumps and associated systems based on this technology. (February 2015-December 2019).
3. CN Bio Innovations Limited, a UK company that develops human organ-on-chip devices that boost the precision and speed of biological research, has licensed from Vanderbilt University three patents and applications, and software, covering microfluidics technologies relevant to the company's organs-on-chips products and IP portfolio. The agreement includes exclusive rights to applications claiming priority from US 15/191,092, as well as non-exclusive rights to US 9,618,129 and applications claiming priority from US 13/877,925, and a license to the Automated Multi-Pump Experiment Running Environment (AMPERE) software. (October 2017).

CN Bio anticipates a formal product release of the commercial version of the VIIBRE MicroFormulator in 2020.

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110. "Differential Optical Flow for Automated Cell Motility," E.G.R. Kim, P. Sivasubramaniam, J.P. Wiksw, and K.T. Seale, MicroTAS Tech Digest '08, pp. 1831-1833 (2008).
111. "Pachinko Biology: Gambling on Single Cells," S.L. Faley, M. Copland, D. Wlodkovic, W. Kolch, K.T. Seale, J.P. Wiksw, and J.M. Cooper, IEEE 35th Annual Northeast Bioengineering Conference, Cambridge, MA, pp. 15-17 (2009).
112. "Four-Focus Single-Particle Position Determination in a Confocal Microscope," L.M. Davis, B.K. Canfield, J.A. Germann, J.K. King, W.N. Robinson, A.D. Dukes, III, S.J. Rosenthal, P.C. Samson, and J.P. Wiksw, in Single Molecule Spectroscopy and Imaging III, J. Enderlein, Z.K. Gryczynski, and R. Erdmann, Eds., Proceedings of the SPIE, Vol. 7571, pp. 757112-1-757112-10 (2010). DOI: 10.1117/12.842572
113. "Investigation of Automated Cell Manipulation in Optical Tweezers-Assisted Microfluidic Chamber Using Simulations," S. Chowdhury, P. Svec, C. Wang, K.T. Seale, J.P. Wiksw, W. Losert, and S.K. Gupta, ASME 2011 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC/CIE2011), August 28-31, 2011, Washington, D.C., Volume 7: 5th International Conference on Micro- and Nanosystems; 8th International Conference on Design and Design Education; 21st Reliability, Stress Analysis, and Failure Prevention Conference, Paper no. DETC2011-48005 pp. 51-62. <http://dx.doi.org/10.1115/DETC2011-48005>.
114. "High-Power Current Source with Real-Time Arbitrary Waveform for *In Vivo* and *In Vitro* Studies of Defibrillation," I. Uzelac, M. Holcomb, R.S. Reiserer, F.H. Fenton, and J.P. Wiksw, Computing in Cardiology, 40: 667-670 (2013).

INVITED TALKS AND COLLOQUIA:

1. "Clinical Magnetocardiography," Non-Invasive Cardiovascular Measurements Conference, Stanford University, 1978.
2. "Magnetocardiography," Bio-Engineering Seminar, University of Minnesota, 1978.
3. "The Meaning of the Magnetocardiogram," Southeast Section of the American Physical Society, Blacksburg, 1978.
4. "The Measurement and Meaning of Biomagnetic Fields," Sigma Xi, United States Naval Academy, 1979.
5. "The Measurement of the Magnetic Field of Nerves," Dept. of Physics, University of Alabama, Birmingham, 1979.
6. "Measurement of the Magnetic Field of Isolated Nerves," Conference of the Engineering in Medicine and Biology Society, Washington, 1980.
7. "Recent Developments in the Measurement of Magnetic Fields from Isolated Nerves and Muscles," Magnetism and Magnetic Materials Conference, Dallas, 1980.
8. "The Magnetic Field of Nerves," AAPT Summer Meeting, Stevens Point, Wisconsin, 1981.
9. "Forward and Inverse Problems in Electrocardiography and Magnetocardiography," 34th Annual Conference for Engineering in Medicine and Biology, Houston, 1981 (Session Chair).
10. "The Magnetic Field of Nerves," Dept. of Physics, Illinois Institute of Technology, Chicago, 1981.
11. "An Advanced Undergraduate Laboratory in Living State Physics," Southeast Section of the American Physical Society, New Orleans, 1981.
12. "The Magnetic Field of Nerves," Dept. of Technical Physics, Helsinki University of Technology, Helsinki, Finland, August 1982.
13. Opponent, Doctoral Thesis Disputation by Timo Varpula, Dept. of Technical Physics, Helsinki University Technology, Helsinki, Finland, August 1982.
14. "Progress in Biomagnetism," Dept. of Electrical Engineering, Tampere University of Technology, Tampere, Finland, August 1982.
15. Three Lectures on "Cellular Action Currents," NATO Advanced Study Institute on Biomagnetism, Frascati, Italy, September 1982.
16. "The ECG-MCG Relationship," NATO Advanced Study Institute on Biomagnetism, Frascati, Italy, September 1982.
17. "The Measurement and Modeling of the Magnetic Field of an Isolated Nerve Axon," Spring Meeting of the American Physical Society, Baltimore, April 1983.
18. "Cellular Magnetism: Theory, Experiment and Applications," Symposium on Frontiers in Electrophysiology, 5th Annual Engineering in Medicine and Biology Society, Columbus, September 1983.
19. "Magnetic Field of Nerves and Cardiac Muscle," Department of Physics, Loyola University, New Orleans, November 1983.
20. "Neuromagnetism: A Possible Technique for Surgeons," Neurosurgical Grand Rounds, LSU Medical Center, New Orleans, November 1983.
21. "Magnetic Measurements of Peripheral Nerve Function," Dept. of Biomedical Engineering, Tulane University, New Orleans, November 1983.
22. "Magnetocardiography: Challenging Clinical Problems and Promising Analytic Techniques," Panel Moderator, Fifth World Conference on Biomagnetism, Vancouver, August 1984.
23. "Theoretical Models for Source Localization," Panelist, Fifth World Conference on Biomagnetism, Vancouver, August 1984.

INVITED TALKS AND COLLOQUIA (continued):

24. "Modelling of Bioelectric Sources," "Neuroelectric Phenomena," and "Neuromagnetism," Three invited lectures at a preconference short-course at Tampere University of Technology, Tampere, Finland, XIV International Conference on Medical and Biological Engineering and VII International Conference on Medical Physics, August 1985.
25. "Magnetic Measurements on Single Nerve Axons and Nerve Bundles," Invited Tutorial, XIV International Conference on Medical and Biological Engineering and VII International Conference on Medical Physics, Espoo, Finland, August 1985.
26. "Measurements and Modeling of Neuromagnetic Fields," 38th Annual Conference on Engineering in Medicine and Biology, Chicago, September 1985.
27. "Cellular Biomagnetism: Nerves and Hearts, Measurements and Models," Department of Physics, New York University, October 1985.
28. "Magnetic Measurements of Single Axons and Nerve Bundles," FASEB Symposium on the Use of Neuromagnetism to Evaluate Normal and Abnormal Nerve Function, St. Louis," April 1986 (Session Chair).
29. "Magnetic Measurements of Cellular Action Currents," Department of Anatomy and Cellular Biology, Emory University, June 1986.
30. "Multicellular Systems: Action Currents and Magnetic Fields," 39th Annual Conference on Engineering in Medicine and Biology, Baltimore, September 1986.
31. "Magnetic Fields of Multicellular Systems: Ohm's Law Revisited," Department of Physics, Western Kentucky University, November 1986.
32. "High-Resolution Measurements of Biomagnetic Fields," 1987 Cryogenic Engineering Conference, St. Charles, Illinois, June 1987.
33. "The Biophysics of Neuromagnetism," The Beckman Institute, University of Illinois, Champaign-Urbana, July 1987.
34. "Finite Element Models for Cardiac Defibrillation," Fortieth Annual Conference on Engineering in Medicine and Biology, Niagara Falls, September 1987.
35. "Magnetic Fields From Action Currents: Instrumentation, Measurements, and Models," Department of Chemical, Bio, and Materials Engineering," Arizona State University, Tempe, September 1987.
36. "The Information Content of Biomagnetic Measurements," Department of Chemistry and Physics, Middle Tennessee State University, Murfreesboro, November 1987.
37. "High-Resolution SQUID Magnetometers for NDE: Sensitivity, Spatial Resolution, and Data Analysis," Office of Naval Research SQUID/Non-Destructive Evaluation Workshop, Harper's Ferry," April 1988.
38. "Applications of SQUIDS to Biomagnetism and Non-Destructive Testing," Hypres, Inc., Elmsford, NY, June 1988.
39. "High Resolution SQUID Magnetometry for Current Imaging: Applications to Biophysics and Non-Destructive Testing," Thomas J. Watson Research Center, IBM, Yorktown Heights, June 1988.
40. "Magnetic Measurements of Action Currents in Bundled Nerves," World Congress on Medical Physics and Biomedical Engineering, San Antonio, August 1988.
41. "Current Distributions in Bisyncytial Tissue," World Congress on Medical Physics and Biomedical Engineering, San Antonio, August 1988.
42. "Virtual Cathode Effects and the Cardiac Bidomain," Basic Arrhythmia Laboratory, Duke University, September 1988.
43. "Magnetic Techniques for Evaluating Peripheral Nerve Function," Special Symposium on Maturing Technologies and Emerging Horizons in Biomedical Engineering, Tenth Annual International Conference of IEEE/EMBS, New Orleans, November 1988.

INVITED TALKS AND COLLOQUIA (continued):

44. Tract Chair for the Biopotentials Tract; Session Chair for "Multicellular and Bidomain Systems," "Nerves and Electric Stimulation," and "Steady Currents," Tenth Annual International Conference of IEEE/EMBS, New Orleans, November 1988.
45. "Applications of SQUIDS to Biomagnetism and Non-Destructive Testing," Texas Instruments, Dallas, July 1989.
46. "Biomagnetic Sources and Their Models," Tutorial Lecture, 7th International Biomagnetism Conference, New York, August 1989.
47. "SQUIDS for NDE," Gordon Conference on Non-Destructive Testing, Ventura, March 1990.
48. "Bioelectricity and Biomagnetism in the Cardiovascular System," Workshop on Bioelectricity and Biomagnetism in Clinical Medicine, Little Company of Mary Hospital, Torrence, April 1990.
49. "Action Currents and Tissue Anisotropy," XVII International Congress on Electrocardiology and the 31st International Symposium on Vectorcardiography, Florence, Italy, September 1990.
50. "High-Resolution SQUIDS for Magnetic Imaging," 12th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Philadelphia, November 1990.
51. "The Vanderbilt University Living State Physics Group: A Case Study in Building a State-of-the-Art Research Program," Leadership Nashville, December 1990.
52. "Non-Destructive Evaluation with SQUIDS," and "High-Resolution Magnetic Imaging for Non-Destructive Testing," E.I. Dupont DeNemours, Wilmington, December 1990.
53. "High-Resolution SQUIDS for Non-Destructive Evaluation," Electric Power Research Institute, Palo Alto, January 1991.
54. "Teaching of Physics to Humanists: A Recent Experiment in Raising Students' Awareness About How They Think and Learn," University Series on Teaching, Vanderbilt, February, 1991.
55. "Magnetic Measurements of Cellular Action Currents," and "Magnetic Fields from Steady Bioelectric Currents," Ninth International Symposium on Man and His Environment in Health and Disease, Dallas, TX, March 1991.
56. "A Close View of Patterns of Electrical Current and Nerve in Cortex," American Physical Society, Cincinnati, OH, March 1991.
57. "The Virtual Cathode and Tissue Anisotropy: Current Flow in the Cardiac Bidomain," and "Capabilities and Limitations of Magnetic Measurements of Bioelectric Activity in Nerve and Muscle," Mayo Clinic, Rochester, MN, May 1991.
58. "Biomagnetic Fields: Information and Disinformation," A.B. Learned Professorship in Living State Physics Inaugural Lecture, Vanderbilt University, October 1991.
59. "Fundamental Factors That Affect the EEG and MEG: Introductory Talk on the Relationship of the Electroencephalogram and the Magnetoencephalogram," EEG/MEG Workshop, Virginia Beach, VA, May 1992.
60. "Magnetic Susceptibility Imaging for Non-Destructive Evaluation," Applied Superconductivity Conference, Chicago, IL, August 1992.
61. "Electric and Magnetic Imaging of the Cardiac Bidomain: The New Information," Special Symposium on Cardiac Electrophysiology, Computers in Cardiology Conference, Durham, NC, October 1992.
62. "Magnetic Imaging of Current and Magnetization Distributions," North American BioMagnetism Action Group (NABMAG), Albuquerque, New Mexico, January 1993.
63. "SQUID Magnetometry for Non-Destructive Evaluation," Superconductivity Technical Action Group (STAG) and Contractors Meeting, Wright-Patterson Air Force Base, OH, March 1993.

INVITED TALKS AND COLLOQUIA (continued):

64. "Superconducting Magnetometry: A Possible Technique for Aircraft NDE," Society of Photo-Optical Instrumentation Engineers Conference on Nondestructive Inspection of Aging Aircraft, San Diego, CA, July 1993.
65. "How Do Ventricular Arrhythmias Start: Triggers," Invited Panelist, Cardiac Electrophysiology: From Cell to Bedside – A Symposium, Keystone Resort, CO, August 1993.
66. "The Cardiac Bidomain: A Macroscopic, Anisotropic Cable Model for Activation and Propagation," Duke-North Carolina National Science Foundation/Engineering Research Center for Emerging Cardiovascular Technologies Defibrillation Workshop, Durham, NC, April 1994.
67. "Advanced Instrumentation and Measurements for Early Nondestructive Evaluation of Damage and Defects in Aerostructures and Aging Aircraft," Second USAF Aging Aircraft Conference, Oklahoma City, OK, May 1994.
68. "Applications of Superconducting Magnetometry to Aircraft Corrosion," Tri-Service Conference on Corrosion, Orlando, FL, June 1994.
69. "SQUID Magnetometers for Biomagnetism and Non-Destructive Testing: Important Questions and Initial Answers," Plenary Lecture, Applied Superconductivity Conference, Boston, MA, October 1994.
70. "SQUID Magnetometers Applied to Aging Aircraft NDE," FAA/USAF/NASA Aging Aircraft Inspection Workshop on Enhanced Conventional Technologies, Ames, IA, November 1994.
71. "The Theoretical Basis of Biomagnetism," NIH Workshop on Developments in Magnetoencephalography as a Functional Imaging Tool, Washington, DC, February 1995.
72. "Magnetometry," North American BioMagnetism Action Group (NABMAG), Washington, DC, February 1995.
73. "Imaging of Electric and Magnetic Sources," NATO Advanced Study Institute on SQUID Sensors: Fundamentals, Fabrication and Applications, Villa del mare, Maretea, Italy, June 1995.
74. "Magnetic Imaging of Cellular Action Currents," NATO Advanced Study Institute on SQUID Sensors: Fundamentals, Fabrication and Applications, Villa del mare, Maretea, Italy, June 1995.
75. "The Two-Dimensional Magnetic Inverse Problem," NATO Advanced Study Institute on SQUID Sensors: Fundamentals, Fabrication and Applications, Villa del mare, Maretea, Italy, June 1995.
76. "Recent Developments in 5K Cryocoolers - An Outsider's View," Closing Summary, 5K Cryocooler Workshop, Hypres, Inc., Elmsford, NY, July 1995.
77. "Advanced Instrumentation and Measurements for Early Nondestructive Evaluation of Damage and Defects in Aerostructures and Aging Aircraft," Air Force 3rd Aging Aircraft Conference, Wright-Patterson AFB, OH, September 1995.
78. "NDE with SQUIDs," Alcoa Technical Center, Alcoa Center, PA, October 1995.
79. "Experimental and Mathematical Linkages Between Microscopic and Macroscopic Descriptions of Cardiac Electrical Activity: Too Many Powers of Ten and the Need for Mesoscopic Models," Department of Physics and Astronomy, Vanderbilt University, November 1995.
80. "Biomagnetism and Non-Destructive Testing: Shared Problems and Solutions," Plenary Lecture, 1996 Biomagnetism Conference, Santa Fe, NM, February 1996.
81. "Tissue Anisotropy and Re-entry in the Heart," Cardiology Grand Rounds, Vanderbilt University Medical Center, Nashville, TN, December 1996.
82. "Magnetic Imaging with SQUIDS," Department of Physics and Astronomy, Vanderbilt University, January 1997.
83. "Cardiac Activation: From Uniform Double-Layers to the Bidomain," Ventritex, Sunnyvale, CA, February 1997.

INVITED TALKS AND COLLOQUIA (continued):

84. "Imaging and Modeling Cardiac Electrical Activity – The Need for Multiple Spatial Scales," 1997 International Conference on Mathematical Models in Medical and Health Sciences, Vanderbilt University, Nashville, TN, May 1997.
85. "SQUIDS for Biomagnetism – Sources, Measurements, and Models," NATO Advanced Study Institute on SQUID Sensors: Fundamentals, Fabrication and Applications, Hotel Alexandra, Loen, Norway, June 1997.
86. "SQUIDS for NDE – Methods and Applications," NATO Advanced Study Institute on SQUID Sensors: Fundamentals, Fabrication and Applications, Hotel Alexandra, Loen, Norway, June 1997.
87. "SQUID Magnetometers for Phase-Sensitive, Depth-Selective, Oriented Eddy Current Imaging," Quantitative NonDestructive Evaluation (QNDE 97), San Diego, July 27-August 1, 1997.
88. "SQUID Measurements of the Rate of Hidden Corrosion," Technical Interchange Meeting - Corrosion Fatigue and Corrosion Predictive Modeling, NCI/USAF, Tinker Air Force Base, Oklahoma City, OK, December 17-19, 1997.
89. "Bioelectric/Biomagnetic Phenomena: Ion Channels to Organ Function," NIH Bioengineering Consortium (BECON), National Institutes of Health, Bethesda, MD, February 28, 1998.
90. "High Speed Fluorescence Imaging of Cardiac Action Potentials: Confirmation of the Doubly Anisotropic Bidomain Model," Biomedical Engineering Seminar, University of Minnesota, Minneapolis, MN, April 7, 1998.
91. "Cardiac Electrodynamics: Just How Does Your Heart Work, and Why Not?" Physics Colloquium, University of Minnesota, Minneapolis, MN, April 8, 1998.
92. "Symmetry, Silent Sources, and Magnetic Imaging with SQUIDS," Condensed Matter Seminar, University of Minnesota, Minneapolis, MN, April 9, 1998.
93. "Biomedical Applications of SQUIDS," Hypres, Inc., Elmsford, NY, April 15, 1998.
94. "Novel Insights on the Virtual Electrode Response," Optical Mapping of Cardiac Excitation & Arrhythmias, Scottsdale, AZ, April 26, 1998.
95. "Tissue Anisotropy and Reentry in the Cardiac Bidomain," Clinical Tutorial on The Mathematics of Electrophysiology, 19th Annual Meeting of the North American Society of Pacing and Electrophysiology (NASPE), San Diego, CA, May 7, 1998.
96. "The Drug-Independent Roles of Cardiac Geometry and Tissue Anisotropy in Defibrillation and Reentry," 11th International Congress, Cardiostim 98, Nice, France, June 18, 1998.
97. "Magnetic Imaging of Cellular Action Currents: The Source-Field Relationships," Electric and Magnetic Fields in Biology and Medicine: Sensory Perception, Self-Organization, and Therapeutic Applications, Gordon Research Conference on Bioelectrochemistry, New England College, Henniker, NH, July 21, 1998.
98. "The Physics of the Heart," Plenary Lecture, 1998 Summer Meeting of the American Association of Physics Teachers, University of Nebraska, Lincoln, NB, August 6, 1998.
99. "Cardiac Electrodynamics - The Good, The Bad and The Non-Linear," Institute for Theoretical Physics, University of California, Santa Barbara, CA, April 28, 1999.
100. "The Role of Tissue Structure and the Extracellular Space in Propagation," North American Society for Pacing and Electrophysiology (NASPE) Clinical Tutorial on Fundamental Mechanisms of Impulse Propagation: From Gap Junctions to Anisotropy, Toronto, Canada, May 13, 1999.
101. "A Brief Introduction to DNA and Quantum Computers," Hypres, Inc., Elmsford, NY, May 27, 1999.
102. "Potential New Acoustical Techniques for Detecting Single-Leg Separation in the Björk-Shiley Heart Valve," Bowling-Pfizer Trust Supervisory Panel, Cincinnati, OH, June 3, 1999.

INVITED TALKS AND COLLOQUIA (continued):

103. "An Introduction to DNA and Quantum Computers," Department of Physics and Astronomy, Vanderbilt University, Nashville, TN, September 2, 1999.
104. "SQUID Microscopes for Magnetic Imaging of Biological Systems," Tutorial on Magnetism and Living Systems, 44th Annual Conference on Magnetism and Magnetic Materials, San Jose, CA, November 15, 1999.
105. "Voltage, Calcium, and Magnetic Field Imaging: Fundamental Studies in Cardiac Excitation, Reentry, and Defibrillation," Vanderbilt Cardiology Group Meeting, January 10, 2000.
106. "Recent Results in Electromagnetic and Acoustic Techniques for Non-Invasive Detection and Catheter-Based Confirmation of Outlet Strut Fracture in the Björk-Shiley Heart Valve," Bowling Pfizer Supervisory Panel, Cincinnati, OH, January 19, 2000.
107. "The Physics of the Heart," focus session on Measuring and Controlling Cardiac Electrophysiology, March meeting of the American Physical Society Meeting in Minneapolis, MN, March 23, 2000; abstract in "The Physics of the Heart," J. Wikswo, Bull. Am. Phys. Soc., 45(1): 833 (2000) (Invited).
108. "Cardiac Planning Session," Vanderbilt University, June 26, 2000.
109. "Magnetic Imaging with SQUIDs: Biomagnetism, NDE, and Corrosion," Neocera, Beltsville, MD, June 28, 2000.
110. "Cardiac Fibrillation: A Challenging Example of Multi-Scale, Non-Linear, Biological Modeling," Panel on Computational Modeling & Simulation of the Dynamic Behavior of Complex Biological Systems and Bio-Engineered Systems, DARPA FOCUS 2000 Workshop, Chantilly, Virginia, June 28-30, 2000.
111. "The Challenges of Spatial Scales in Modeling and Understanding Cardiac Fibrillation," Chicago World Congress on Medical Physics and Biomedical Engineering, and the 22nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Chicago, July 23-28, 2000.
112. "Review of Iowa/Vanderbilt Research on Detection of Outlet Strut Fracture in the Björk-Shiley Heart Valve," Bowling Pfizer Supervisory Panel, Pasadena, CA, October 27, 2000.
113. "Instrumenting and Controlling the Single Cell: Patch Clamp to Silicon and Talking to Cells with Light," DARPA Workshop on Nanotechnology for Biodetection/Bioassay and Delivery of Therapeutics to Individual Cells, Scottsdale, AZ, December 13-14, 2000.
114. "Discussion Group A: Biodetection/Bioassay of Individual Cells," (Co-Chair), DARPA Workshop on Nanotechnology for Biodetection/Bioassay and Delivery of Therapeutics to Individual Cells, Scottsdale, AZ, December 13-14, 2000.
115. "Phase and Wave Vector Dynamics During Cardiac Reentry," Dynamics Days 2001, Chapel Hill, NC, hosted by the Duke University Physics Department and the Center for Nonlinear and Complex Systems, January 3-6, 2001.
116. "Cardiac Physics: How Your Heart Works, or Doesn't," Nashville Rotary Club, Nashville, TN, February 26, 2001.
117. "Cardiac Phase Plane Dynamics During Stimulation and Reentry," American Physical Society, Seattle, March 15, 2001.
118. "A Multiscale View of Cardiac Electrodynamics," The A.C. Suhren Jr. Lecture Series, Tulane University, New Orleans, LA, March 29, 2001.
119. "The Physics of the Heart: Optical and Magnetic Imaging of Cardiac Activity," Theoretical Biophysics Seminar, Beckman Institute, University of Illinois, 15-20 minute overview of the heart, then the bidomain, then reentry, April 30, 2001.

INVITED TALKS AND COLLOQUIA (continued):

120. "The Magnetocardiogram, Tissue Anisotropy, and the Cardiac Bidomain," co-authored with Franz Baudenbacher at "The Integrated Heart: Cardiac structure and function" a satellite meeting of the 34th World Congress of the International Union of Physiological Sciences in Queenstown, New Zealand, August 20, 2001.
121. "Multiphasic, Dynamic, High Throughput Measurements and Modeling for Postgenomic Cellular Biophysics," and panel discussion on Automating Physiological Data Collection: A Link to High-Throughput Modelling at the Scientific Advisory Board Meeting, Physiome, Inc., Princeton, NJ, November 10, 2001.
122. "SQUID Imaging of Exfoliation and Intergranular Corrosion," coauthored with Yu Pei Ma of Vanderbilt, Kevin Cooper of Luna Innovations, Inc., James Suzel of S&K Technologies, and Robert Kelly of the University of Virginia. Air Force Corrosion Program Office/S&K Technologies Working Group Meeting, Dayton, OH, November 14, 2001.
123. "High-Content Toxicology Screening Using Massively Parallel, Multi-Phasic Cellular Biological Activity Detectors," coauthored with Franz Baudenbacher, Robert Balcarcel, David Cliffler, Sven Eklund, Jonathan Gilligan, Owen McGuinness, Todd Monroe, Mark Stremler, Roy Thompson, Ales Prokop, and Andreas Werdich, DARPA PI Meeting, Miami, FL, February 21, 2002.
124. "Models and Measurements of the Anisotropic Cardiac Bidomain," Instituto de Matemática Pura e Aplicada, Rio de Janeiro, Brazil, May 6, 2002.
125. "The Physics of the Heart," XXV Encontro Nacional de Física de Matéria Condensada, Caxambu, Brazil, May 9, 2002. (Plenary)
126. "Virtual Electrodes," coauthored with Rubin Aliev, Mark-Anthony Bray, Franz Baudenbacher, Petra Baudenbacher, Veniamin Sidorov, Marcella Woods of Vanderbilt University, and Brad Roth of Oakland University, Cardiostim 2002, Nice, France, June 20, 2002.
127. "Imaging Hidden Corrosion with SQUID Magnetometers," Gordon Conference on Aqueous Corrosion, New London, NH, July 14-18, 2002.
128. "Vacuum Pair Production/Annihilation and Cardiac String Dynamics," Aspen Center for Physics," Aspen, CO, August 22, 2002.
129. "The Physics of the Heart," Heinz R. Pagels Memorial Lecture," Aspen Center for Physics, Aspen, CO, August 28, 2002.
130. "Experimental and Computational Requirements for Post-Genomic Integrative Cellular Physiology," Intel Workshop on Early Detection, San Francisco, CA, September 24, 2002.
131. "VIIBRE: The Vanderbilt Institute for Integrative Biosystems Research and Engineering," Vanderbilt University Committee of Visitors Meeting, November 15, 2002.
132. "The Physics of the Heart," Department of Physics and Applied Physics Joint Colloquium, Stanford University, November 19, 2002.
133. "The Physics of the Heart," Vanderbilt Houston Alumni Club Fall Alumni Luncheon Series, December 4, 2002.
134. "Cardiac Phase, in the Spatial or Phase Domains, for Identifying Reentrant Behavior and Examining the Response of Cardiac Tissue to Electrical Stimulation," John Wikswo and Mark-Anthony Bray, Gordon Conference on Cardiac Arrhythmia Mechanisms, New London, NH, August 11, 2003.
135. "BioMEMS and the Measurements Needed to Drive Physiological Models," Biomedical Engineering Conference, Nashville, TN, October 2, 2003.
136. "An Overview of the Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE)," Industrial/Practitioner Advisory Board for the Department of Biomedical Engineering, October 21, 2003.

INVITED TALKS AND COLLOQUIA (continued):

137. "Correlations Between Single Cell Signaling Dynamics and Protein Expression Profiles," DARPA Meeting on Real Time Monitoring of Signaling Pathways in Biological Cells, Arlington, VA, April, 22, 2004.
138. "From Physics to Medicine: Cardiac Complexity and the Challenges of Modeling Multiscale Causality," International Conference on Complex Systems (ICCS2004), Boston, MA, May 16, 2004.
139. "Measurements versus models in cardiac strong-shock response," John Wikswo and Marcella Woods, 2004 SIAM Conference on the Life Sciences, Portland, Oregon, July 12, 2004.
140. "BioMEMS for Instrumenting and Controlling the Single Cell," Workshop on Microanalytical Devices for Bioprocessing, 2004 IEEE EMBS Conference, San Francisco, CA, September 1, 2004.
141. "The Need for Cellular and Molecular Sensors and Actuators," Mini-Symposium: Biomolecular Processors through Micro- and Nanotechnology, 2004 EMBS IEEE Conference, San Francisco, CA, September 2, 2004.
142. "Correlations Between Single Cell Signaling Dynamics and Protein Expression Profiles," DARPA SIMBIOSIS Meeting, Vail, Colorado, October 14, 2004.
143. "Instrumentation Challenges for Systems Biology," Keynote Lecture, Third IEEE Sensors Conference, Vienna, Austria, October 26, 2004.
144. "The Need for Dynamic Sensing and Control of Cells to Specify and Validate Systems Biology Models," Systems Biology Lecture Series, University of Michigan, Ann Arbor, MI, November 16, 2004.
145. "Systems Biology - The Next New Biology?" Vanderbilt Alumni Club, Nashville, TN, December 2, 2004.
146. "Integrative Systems for Biotechnology and Bioinformatics A Workshop on Challenges and Opportunities in Integrative Macro- Micro- and Nano-Systems," Sponsored by the National Science Foundation, Arlington, VA., March 7-8, 2005.
147. "The Technical and Computation Challenges of Merging NanoScience and Systems Biology," UT Dallas, May 4, 2005.
148. "Back to the Future: Systems Biology as the New Physiology," UCSD Center for Theoretical Biological Physics, San Diego, April 22, 2005.
149. "Cellular Metabolic and Signaling Dynamics for Toxin Classification, Therapy, and Prophylaxis," DARPA Cell Signaling Workshop, Arlington, September 27, 2005.
150. "Cellular and Synthetic Signaling Pathways for Detecting and Classifying Unknown Toxins and Emerging Pathogens," UES Kickoff Meeting, Dayton, October 13, 2005.
151. "An Update on the Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE)," Industrial/Practitioner Advisory Board for the Department of Biomedical Engineering, Vanderbilt University, October 25, 2005.
152. "Metabolic and Signaling Dynamics for Cell Biology, Toxin ID, and Drug Discovery," Systems Biology Department, Harvard University, Boston, October 26, 2005.
153. "Systems Biology - The Next New Biology?" Houston Vanderbilt Alumni Club, Houston, December 1, 2005.
154. "VIIBRE: Dynamic Cellular Instrumentation and Control for Quantitative, Experimental Systems Biology, Biodefense, and Toxicology," Oak Ridge Area Director Briefing, Vanderbilt University, December 12, 2005.
155. "The Systems Engineering Problems of Systems Biology," Plenary Lecture, 38th IEEE Southeastern Symposium on Systems Theory, Cookeville, TN, March 6, 2006.

INVITED TALKS AND COLLOQUIA (continued):

156. "The Promise and Challenges of Multianalyte Metabolic Dynamics," John Wikswo, Franz Baudenbacher, David Cliffel, Ales Prokop, Momchil Velkovsky (Vanderbilt University); Bela Csukas (Kaposvar University, Hungary); Jerry Jenkins, Shankar Sundaram (CFD Research Corporation), BioLSI-2; Kavli Nanoscience Institute, Caltech, April 11, 2006.
157. "Dynamic Cellular Instrumentation and Control for Quantitative, Experimental Systems Biology, Biodefense, and Toxicology," Department of Biomedical Sciences, Meharry Medical College, April 17, 2006.
158. "The Five Dimensions of Systems Biology," Microscale Life Sciences Center at University of Washington, April 21, 2006.
159. "Where Should We Look for Our Keys?" Keck Roundtable Discussion on the Future of Sciences, Los Angeles, CA, May 5-6, 2006.
160. "Max Delbrück at Vanderbilt – 1940-1947," The Max Delbrück Vanderbilt Centenary Celebration, Vanderbilt University, September 14, 2006.
161. "SyBBURE: Systems Biology and Bioengineering Undergraduate Research Experience," Vanderbilt Parents Leadership Council, Vanderbilt University, September 29, 2006.
162. "Between the Street Lamps: Looking for Missing Keys to Cancer Using a BioMEMS Flashlight," Cancer Biology Retreat, Lake Barkley, Cadiz, KY, November 17-18, 2006.
163. "BioMEMS Approaches to the Missing-Data Problem in Systems Biology," Program in Biomedical Engineering, University of Memphis, February 16, 2007.
164. "BioMEMS and Symbolic Regression for Automated Inference of Metabolic Network Dynamics," Institute for Advanced Study, May 9, 2007.
165. "Systematic Extraction of Minimal Network Models from Model Cellular Systems for the Design of Robust Abiotic Signaling Networks," CB Defense Conference, Timonium, MD, November 13, 2007, Coauthors: John P. Wikswo, Michael Schmidt, Jerry Jenkins, David Cliffel, Roy Thompson, and Hod Lipson.
166. "BioMEMS Instrumentation and Control for Autocrine, Paracrine, Juxtacrine and Mechanical Signaling," Mathematical Biosciences Institute, Columbus, Ohio, November 14, 2007.
167. "Microdevices and Models for Cellular Metabolic Dynamics," IBM Thomas Watson Research Center, Yorktown Heights, New York, May 21, 2008.
168. "The Possibility of Automated Experiments for Inference of Metabolic Models," CNLS q-bio Seminar, Center for Nonlinear Studies, Los Alamos National Laboratory, September 16, 2008.
169. "Microdevices for Studying Cell-Cell Communication, Chemotaxis, and Haptotaxis," Symposium on Microelectromechanical Systems in Cell Biology, Experimental Biology 2009, New Orleans, April 19, 2009.
170. "Avoiding Biology's Epistemological Crisis," Millipore Future Foresight Forum, Boston, MA, September 1-2, 2009.
171. "The Challenges of Controlling Living Cells," Belmont University Sixth Annual Undergraduate Research Symposium, December 3, 2009.
172. "Avoiding the Problem of Seven: Can Computers Design and Conduct Experiments for Automated Inference of Models of Cellular Metabolic and Signaling Networks?" Physics Colloquium, Emory University, April 23, 2010.
173. "Can We Comprehend the Full Complexity of Our Own Biology?" Biomedical Engineering Distinguished Lecturer Series, University of California - Irvine, April 30, 2010.
174. "BioMEMS and IM-MS: Towards the automated inference of metabolic and signaling pathways in health and disease," John Wikswo, Institut Curie, Paris, 23 June 2010

INVITED TALKS AND COLLOQUIA (continued):

175. "The Robot Scientist or: How I learned to stop worrying and love automated model inference." Q-Bio, Santa Fe, August 14, 2010
176. "A Biophysics and Bioengineering Perspective: What makes breast cancer a hard problem, and where are the keys to control, cure, and prevention?" 2010 NSF Advances in Breast Cancer Research Workshop, October 28, 2010, University of Arkansas
177. "The Challenges of Characterizing and Controlling Emergent Behavior in Complex Neural Systems," New Tools for Neuroscience: Workshop I – Defining the White Space Opportunities. Defense Science Research Council, Arlington, VA, November 4, 2010.
178. "Challenges in Characterizing and Controlling Complex Cellular Systems," American Physical Society March Meeting, Dallas, March 24, 2011.
179. "Systems Biology: Opportunities at the Intersection of Medicine, Biology, Chemistry, Engineering, Mathematics, and Physics," Biology Seminar, David Lipscomb University, April, 2011.
180. "New tools and techniques for connecting cardiac electrophysiology and metabolism," Third Annual Cardiovascular Research Day, Vanderbilt University, April 20, 2011
181. "Case Study: Dynamic Omni-Omic Biosignatures -- Rapid Presymptomatic Diagnosis in 10,000 and 1 dimensions?" Bioinformatics and Knowledge Management Workshop, JSTO/DTRA, Falls Church, VA, September 22-23, 2011
182. "Microfluidics for High Content Imaging of Cellular Dynamics," John P. Wikswow, Vanessa Allwardt, Dawit Jowhar, Dmitry Markov, Christopher Janetopoulos, and Philip Samson, Joint BBSRC UK and Vanderbilt University Workshop on Cell signaling and cytoskeleton in directed cell migration: Imaging and quantitative approaches, Vanderbilt University, March 4 – 6, 2012 (Organizers: Andrew B. Goryachev and Christopher Janetopoulos)
183. "Beyond pathogen genomics and the host immune memory response: Can dynamic omni-omic challenge/response experiments inform exposure status?" John P. Wikswow and John A. McLean, JASON 2012 Exposure Status Summer Study, Mitre Corporation, La Jolla, CA, June 19-20, 2012.
184. "Scaling and systems biology for integrating multiple organs-on-a-chip," John P. Wikswow, Erica L. Curtis, Zachary E. Eagleton, Brian C. Evans, Ayeeshik Kole, Lucas H. Hofmeister, and William J. Matloff, Poster Spotlight, Q-Bio, Santa Fe, NM, August 8-11, 2012
185. "What do we do if the human body is too complex for humans to understand?" BioInformatics Seminar, Vanderbilt University, September 5, 2012.
186. "Advanced Instrumentation for Automated Quantitative Biology," CFD Research Corporation, 21 September 2012.
187. "Neurovascular unit on a chip: Chemical communication, drug and toxin responses," NIH Microphysiological Systems Program: First Investigators' Meeting, NIH, Bethesda, Maryland, October 1-2, 2012.
188. "Working Group Report on Cardiovascular Systems Engineering," John P. Wikswow and Steven C. George, IEEE Life Sciences Grand Challenges Conference, Washington, DC, Oct 4-5, 2012.
189. "Why automated biology, robot scientists, and organs on a chip?" Agilent, Santa Clara, CA 6 November 2012.
190. "New approaches to microfluidic pumps and valves for Organs on Chips," LabSmith, Livermore, CA, 5 November 2012.
191. "Instrumentation for Strong Automated Biology," EMD Millipore LabASIC, Fremont, CA, 5 November 2012.
192. "A top-down approach to cellular sensing: Platforms and Microfluidics," Cellular Sensing Systems Workshop, Applied Physics Laboratory, Johns Hopkins University, Scottsdale, AZ December 3–4, 2012.

INVITED TALKS AND COLLOQUIA (continued):

193. "Engineering Challenges for Instrumenting and Controlling Integrated Organ-on-Chip Systems, John P. Wikswo, Vanessa Allwardt, Frank E. Block, David E. Cliffler, Jeffrey R. Enders, Cody R. Goodwin, Christina C. Marasco, Dmitry A. Markov, David L. McLean, John A. McLean, Jennifer R. McKenzie, Ronald S. Reiserer, Philip C. Samson, David K. Schaffer, Kevin T. Seale, and Stacy D. Sherrod, 2012 IEEE-EMBS Micro- and Nanoengineering in Medicine Conference of the IEEE Engineering in Medicine and Biology Society, Ka'anapali, Hawaii, December 3-7, 2012.
194. "The Homunculi and I: Lessons from Building Organs on Chips," TEDx Nashville, April 6, 2013.
195. "Addressing Engineering and Scaling Challenges for Organs on a Chip," Center for Engineering in Medicine, Massachusetts General Hospital, Harvard Medical School, Shriners Hospitals for Children, Boston. April 12, 2013
196. "Replacing Silos with Phase Space: Teaching, Research, and Ourselves," College of Health Sciences and Nursing, Belmont University, May 6, 2013
197. "Engineering In Vitro Human Organ Platforms," in INTO-RAM ATHENA: Multi-organ Platform for Rapid Assessment of Medical Countermeasures - DTRA Special Session, TechConnect World 2013, May 13, 2013, Washington, DC.
198. "Engineering Challenges in Scaling, Sensing, and Control for Organs-on-Chips, iPSCs, and Systems Biology," Applied Mechanics Colloquium, Harvard University, 2 October 2013
199. "Transdisciplinary perspectives on instrumentation architecture: A case study in how Organ-on-Chip engineering may provide new tools to biology, medicine, and physiology." Scoping meeting on Enabling Architecture for the Next Generation of Life Sciences Research, Board on Life Sciences, The National Academies, Washington, DC, 30 October 2013.
200. "Biological complexity, systems biology, and organs on a chip," Physics and Astronomy Faculty, 8 November 2013
201. "The Neurovascular-Unit-on-a-Chip 'Microbrain' to improve drug testing and advance systems biology." 2013 American Association of Pharmaceutical Scientists (AAPS) Roundtable on "Of Organs and Chips: Innovative Tools for Disease Modeling and Drug Development in Barrier Epithelia", Annual meeting of the AAPS, San Antonio, TX, Wednesday, November 13, 2013.
202. "What are the QSP bottlenecks?" Jeremy Berg, Pittsburgh; Ashley Dombrowski, Bay City Capital; Ron Krall, GSK; Andrew Plump, Sanofi; James Stevens, Eli Lilly; Lans Taylor, Pittsburgh; John Wikswo, Vanderbilt, Pittsburg Workshop on Quantitative Systems Pharmacology (QSP) in Personalized Medicine (PM), Pittsburgh, PA, 20 November 2013
203. "A physicist's perspective on the complexity of biology," Physics Colloquium, Department of Physics, Ohio University, 28 February 2014
204. "Challenges of Developing an Integrated Human on a Chip System," Society of Toxicology Annual Meeting, Phoenix, AZ from March 26, 2014.
205. "Omni-Omics to study and control immune cells on a chip," Sanofi Pasteur VaxDesign, Orlando, FL, May 6, 2014. "Homunculi and Hermeneutics - How organs on a chip can close the circle of biology," Hopkins NIH Digestive Diseases Basic & Translational Research Core Center, Johns Hopkins University, Baltimore, September 30, 2014
206. "Can Homunculi change the way we develop new drugs and tests for environmental toxins?" Life Science Tennessee Annual Conference, Nashville, TN, October 22, 2014
207. "Scaling and Systems Biology for Integrating Multiple Organs-on-a-Chip," Closing Keynote Address, Engineering Functional 3D Models Conference and Organotypic Culture Models for Toxicology Conference, Functional Analysis & Screening Technologies (FAST) Congress, November 18, 2014.
208. "Biology coming full circle: Joining the whole and the parts," Quantitative & Computational Biology Seminar, Lewis-Sigler Institute for Integrative Genomics, Princeton University, December 1, 2014.

INVITED TALKS AND COLLOQUIA (continued):

209. "Systems biology, organs-on-chips, metabolomics, and closing the hermeneutic circle of biology," CQS Systems Biology Program Retreat, January 22, 2015.
210. "Integrating multiple organs on chips: What might we learn, what do we need, and how might we do it?" 3D Cellular Models Conference, World Pharma Conference, Boston, MA, June 11-12, 2015.
211. "Characterizing and Validating Biological and Physiological Relevance of an In Vitro Microphysiological System," Society of Toxicology, San Diego, CA, March 24, 2015.
212. "In Vitro Microphysiological Systems for Drug Development, Systems Biology, and Neuroscience," AstraZeneca Webinar, 29 April 2015.
213. "Connecting the Whole and the Parts: Organs on Chips and Cytometry," Frontier Lecture, CYTO2015, Glasgow, Scotland, June 28, 2015.
214. "Application of Organ on a Chip Models to Toxicity Testing," Keynote Session: Organ-Chip and 3D Microtissue Models as the New Frontier in Toxicity Testing, Gordon Research Seminar on Cellular & Molecular Mechanisms of Toxicity, Andover, NH, August 8, 2015.
215. "Nanoscience and Biology: Connecting Nano to Micro and Milli for in Vitro Interrogation and Control," NSF-sponsored annual Nanoscale Science and Engineering Grantees Conference, Arlington, VA, December 9-10, 2015.
216. "Organs on Chips: An in vitro platform for quantitative human systems pharmacology," Vanderbilt Pharmacology Graduate Student Association Seminar, December 16, 2015.
217. "Tool to close the hermeneutic circle of biology: Tissue chips, pumps, valves, and automated model inference," Quantitative Systems Biology Center, Vanderbilt University, February 12, 2016
218. "Organs on Chips: Bioreactors, Sensors, Controls, and Interconnects to Support Constructionist Biology," Department of Biomedical Engineering, Northwestern University, Evanston, IL, April 28, 2016.
219. "Human Neurovascular Unit On-A-Chip: Microscale Systems for Tissue-Level Response," 2016 Teratology Society annual joint meeting with the Developmental Neurotoxicology Society, San Antonio, TX, June 25-29, 2016.
220. "Modular architectures and control strategies for coupled microphysiological systems," Drug Safety Gordon Research Conference: Improving Drug Safety: From Innovation in the Lab to Application in the Clinic, Stonehill College, Easton, MA, June 26-July 1, 2016.
221. "Organs on Chips for drug development, toxicology, and systems biology: A distributed yet interconnected modular approach," Organ-on-a-Chip World Congress 2016, Boston, MA, July 7-8, 2016.
222. "Organ-on-Chip Blood-Brain Barriers/Neurovascular Units and Supporting Hardware to Study Neuroinflammation," John P. Wikswo and Jacquelyn A Brown, 2016 Alphavirus Science and Technology Review, Defense Threat Reduction Agency (DTRA, JSTO-CBD) and the Joint Vaccine Acquisition Program (JVAP,JPEO-CBD), Springfield, VA, August 22-24, 2016.
223. "In Vitro Modeling of the Blood Brain Barrier Using Complex 3D Models," and "Hands on with Organ-on-a-chip Workshop," 3D Tissue Models: Drug Discovery & Development, San Diego, CA, August 29-31, 2016.
224. "Probing the complexities of biology and medicine: Closing the hermeneutic circle with in vitro models to study nerve pain and neural responses to pain medication," TMJ Association's Eighth Scientific Meeting, Can Precision Medicine Inform the Etiology and Treatment of TMD and Chronic Overlapping Pain Conditions, Bethesda, MD, September 11-13, 2016.
225. "Human neurovascular unit on a chip: metabolic consequences of inflammatory disruption of the blood-brain barrier and the possibility of diurnal, in vitro humoral modulation of neuronal activity," 3D CNS Disease Modeling Workshop, Society for Neuroscience Satellite Symposium, San Diego, CA, November 11, 2016.

INVITED TALKS AND COLLOQUIA (continued):

226. "Cutting-Edge Safety – Pre-Clinical In Vitro Models," Pre-Meeting Course on Chemical Biology: A New Tool for Parasite Biology and Drug Development, Annual Meeting of the American Committee of Molecular, Cellular and Immunoparasitology of the American Society of Tropical Medicine and Hygiene, Atlanta, GA, November 13, 2016.
227. "Tissue Chips Research and Education at Vanderbilt," Briefing for Christopher P. Austin, M.D., Director, NIH National Center for Advancing Translational Sciences, Vanderbilt University, Nashville, TN, December 14, 2016.
228. "Organs-on-chips, metabolomics, systems biology, and closing the hermeneutic circle of biology," VCR Distinguished Lecture, The University of Tennessee Health Science Center, Memphis, TN, December 15, 2016.
229. "Modular Architectures and Control Strategies for Coupled Microphysiological Systems," Eli Lilly, Indianapolis, IN, January 4, 2017.
230. "Multichannel Microformulators Suitable for Massively Parallel Automated Design of Biological Experiments," American Physical Society, New Orleans, LA, March 13-17, 2017.
231. "Organs on Chips for Drug Discovery and Development" Eli Lilly Grand Rounds, Indianapolis, IN, March 22, 2017.
232. "Organs-on-Chips and the VIIBRE NeuroVascular Unit," Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, April 10, 2017.
233. "Progress toward adoption of microphysiological systems in biology and medicine," Introduction to a symposium sponsored by the Society for Experimental Biology and Medicine at Experimental Biology 2017, Chicago, IL, April 24, 2017.
234. "Learning without boxes," College Scholars Senior Recognition Dinner, Vanderbilt University, Nashville, TN, April 28, 2017.
235. "Vanderbilt Microphysiological Systems NeuroVascular Unit," John Wikswo and Jacquelyn Brown, NIH-NCATS Tissue Chips for Drug Screening Close-Out Meeting, Rockville, MD, May 10, 2017.
236. "Topologies, Analytics, and Automation for Microphysiological Systems," Select Biosciences Organ-on-a-Chip Europe 2017 track of the Lab-on-a-Chip & Microfluidics 2017 conference, Munich, Germany, May 10-11, 2017.
237. "Organs on Chips: Tissues, Support Hardware, and Analytics" Fraunhofer Institute for Interfacial Engineering and Biotechnology, Stuttgart, Germany, May 12, 2017.
238. "NeuroVascular Unit V2.0: Perfusion Control and Bioreactors," Eli Lilly Neuroscience Briefing, Indianapolis, IN, May 23, 2017.
239. "Analytical Chemistry for Understanding the Physiology and Pathology of 3D Cellular Models: Examples from the Neurovascular Unit/Blood-Brain Barrier," 3D Cellular Models track at the World Preclinical Congress, Boston, MA, June 14-15, 2017.
240. "Identify the requirements that would determine quantitatively whether an MPS is superior to existing in vitro and animal assays," Moderator for interactive breakout discussion, 3D Cellular Models track at the World Preclinical Congress, Boston, MA, June 14-15, 2017.
241. "Fitting iPSCs, 3D cell culture, tissue chips and microphysiological systems into the grand scheme of biology, medicine, pharmacology, and toxicology," Select Biosciences Organ-on-a-Chip World Congress and 3D-Culture 2017 Conference, Boston, MA, July 10, 2017.
242. "Scientific and technical strengths and limitations of MPS for drug toxicity testing," Session on "When Will Microphysiological Systems (Organ-On-Chip Technologies) Be Ready to Replace Animals in Nonclinical Safety Assessments to Support Phase 1 Clinical Pharmacology Studies?" The Toxicology Forum: 43rd Annual Summer Meeting, Annapolis, MD, July 12, 2017.

INVITED TALKS AND COLLOQUIA (continued):

243. "Organs-on-chips and microphysiological systems as models for quantitative systems pharmacology and the development of neurotherapeutics," NIH Workshop: Quantitative Systems Pharmacology and Drug Discovery: Filling the Gaps in Current Models of the R&D Process for Neurotherapeutics, Bethesda, MD, July 26-27, 2017.
244. "Hormonal Modulation of Organs-on-Chips to Recapitulate In Vivo ADME Tox Profiles In Vitro," 3D Tissue Models Summit, Boston, MA, August 29-30, 2017.
245. "Organs-on-Chips: A Developer's Masterclass," 3D Tissue Models Summit, Boston, MA, August 29-30, 2017.
246. "Panel Discussion: Development of Complex In Vitro Models for Preclinical Efficacy Testing," 3D Tissue Models Summit, Boston, MA, August 29-30, 2017.
247. "Functional coupling of human microphysiological systems," Advancing Disease Modeling in Animal-Based Research in Support of Precision Medicine: A Workshop of the Roundtable on Science and Welfare in Laboratory Animal Use," Institute for Laboratory Animal Research, supported by the Office of Research Infrastructure Programs of the NIH; National Academies of Sciences Building, Washington, DC, October 5-6, 2017.
248. "The opportunities and challenges of engineered models of cancer: cells, hardware, analytics, and interpretation," Physical Sciences-Oncology Network Annual Investigators Meeting, Koch Institute, Massachusetts Institute of Technology, Cambridge, MA, October 17-19, 2017.
249. "Strengths, Limitations and Applications of Microphysiological Systems for Drug Development," Food and Drug Administration Toxicology Working Group, White Oak, MD, October 26, 2017.
250. "Microphysiological model systems in toxicology," Biochemistry 8336 Guest Lecture, Vanderbilt University, Nashville, TN, October 30, 2017.
251. "Blood-Brain Barrier Microphysiological Systems in Toxicology," Vanderbilt University Training Grant Open House, Nashville, TN, November 4, 2017.
252. "Organs-on-Chips: A review of immune and skin models," Elizabeth Phillips Research Group, Department of Pathology, Microbiology, and Immunology, Vanderbilt University, Nashville, TN 37235, December 4, 2017.
253. "The union of organs-on-chips and mass spectrometry multi-omics: a technological convergence that will advance drug discovery and toxicology," Leaders in Chemical and Physical Biology Seminar, Vanderbilt University, Nashville, TN, February 26, 2018.
254. "MicroPhysiological Systems: Organs on Chips, Tissue Chips, Hardware, and Analytics," Biomedical Engineering Seminar, University of California-Irvine, Irvine, CA, March 9, 2018.
255. "Drug development for tuberous sclerosis complex and other pediatric epileptogenic diseases using neurovascular and cardiac microphysiological models," John P. Wikswo, Aaron B. Bowman, Kevin C. Ess, Jacquelyn A. Brown, Robert Carson, Young Wook Chun, Charles C. Hong, Rebecca Ihrie, Ethan S. Lippmann, M. Diana Neely, Matthew S. Shotwell, Veniamin Y. Sidorov, Chaitali Ghosh, Damir Janigro, and Mustafa Sahin, Tissue Chip Consortium Meeting, Bethesda, MD, March 26, 2018.
256. "What can pumps and valves do for MicroPhysiological Systems?" CN Bio Innovations, Ltd., Welwyn Garden City, UK, May 21, 2018.
257. "The union of organs-on-chips and mass spectrometric multi-omics: a technological convergence that will advance drug discovery," European Laboratory Research and Innovation Group (ELRIG) Conference, Discovery Technologies 2018, Alderley Park, Cheshire, UK, May 23, 2018.
258. "MicroPhysiological Systems: Organoids, Organs-on-Chips, Analytical Systems, and Control," Keynote Address, EUROoC, Stuttgart, Germany, May 24, 2018.

INVITED TALKS AND COLLOQUIA (continued):

259. "Openable Organ-in-a-Puck and MultiOmics for In Vitro Investigation of Host-Pathogen Interactions in the Gut and Brain," John P. Wiksw, Nicole Muszynski, Melissa Farrow, and Danielle Gutierrez, CB Technology Watch, Defense Threat Reduction Agency, Springfield, VA, July 31, 2018.
260. "Advancing Drug Discovery Through the Technological Convergence of Organs-on-Chips and Mass Spectrometric Multi-Omics," Predict: 3D Models Conference, Boston, MA, August 21-23, 2018 (Hanson Wade).
261. "Tissue Chips and Organs-on-Chips: Emerging Models for In Vitro Studies of the Cellular Microenvironment, Organ-Organ Communication, and Host-Tumor Interactions," Host Tumor Interactions Research Program Retreat, Vanderbilt University, Nashville, TN, September 17, 2018.
262. "Organ-on-a-Chip 101," Pre-meeting workshop on "Organ-on-a-Chip: What Is It and How Can It Advance the Role of Clinical Pharmacology in Drug Discovery and Development," American College of Clinical Pharmacology Annual Meeting, Bethesda, MD, September 23, 2018.
263. "Scientific, Engineering, and Translational Intersections and Trajectories: Organs-on-chips, organoids, stem cells, microfluidics, well plates, acoustics, and multi-omics," Organ-on-a-Chip World congress and 3D-Bioprinting 2018, San Diego, CA, October 4-5, 2018 (SelectBio).
264. "Microphysiological Model Systems in Toxicology," Biochemistry 8336, Vanderbilt University, October 26, 2018.
265. "Cell-Based Models for Drug Discovery and Development: Control Instrumentation, In Vitro Systems, and In Silico Modeling," Kapil Pant and John Wiksw, NIH/NCATS, November 9, 2018.
266. "Design and Analysis of Microfluidic Tissue Equivalents," Wound Healing: Innovation and Discovery Symposium, Innovations in Wound Healing, Key West, FL, December 6-9, 2018.
267. "Complexity, Microphysiological Systems, and Closing the Hermeneutic Circle of Biology," International Organ-on-Chip Workshop: From Systems Biology to Societal Issues, Milan, Italy, February 14-15, 2019.
268. "Can a massively parallel multi-omics system for controlling iPSC differentiation be run backwards to control cancer?" Tumor Microenvironment & Immunology meeting, Vanderbilt University, April 1, 2019.
269. "Tissue chips for accelerating the development of diagnostics and medical countermeasures for CBRN threats," Biomedical Advanced Research and Development Authority (BARDA) TechWatch, Washington DC, April 29, 2019.
270. "Microphysiological Systems, Mechanisms of Action, and Chronotoxicology," Gordon Conference on Cellular and Molecular Mechanisms of Toxicology (CMMT), Andover, NH, August 11-16, 2019.
271. "Organ-on-Chip Masterclass," Preconference Workshop, 4th PREDiCT 3D Tissue Models Summit, Boston, MA, September 4-6, 2019.
272. "Utilizing 3D Cultures in the Blood-Brain Barrier to Clarify Translational Endpoints," 4th PREDiCT 3D Tissue Models Summit, Boston, MA, September 4-6, 2019.
273. "VIIBRE's Microphysiological Systems Technologies," Briefing for the U.S. Army Combat Capabilities Development Command Chemical Biological Center (CCDC-CBC), Vanderbilt University, September 17, 2019.
274. "Pumps, Valves, and Fluidic Connectors for Automating and Integrating Microphysiological Systems," SelectBIO Organ-on-a-Chip World Congress, Coronado Island, CA, October 14-15, 2019
275. "Of and About Biomaterials: Tissue Chip Bioreactors and Perfusion Control Systems," NIH Workshop on Tissue Chip Platforms as Tools for Testing Biocompatibility and Biototoxicity of Biomaterials, National Institutes of Health, Washington, D.C., October 24-25, 2019.

INVITED TALKS AND COLLOQUIA (continued):

276. “Microphysiological Model Systems in Toxicology,” Biochemistry 8336, Vanderbilt University, October 30, 2019.
277. “Bridging the Gap Between Organs-on-Chips and Multi-Omic Analysis for In Vitro Investigation of Incapacitating Agents and Medical Countermeasures,” John Wikswo (presenting), Jeremy Norris, Melissa Farrow, Danielle Gutierrez, Nicole Muszynski, Stacy Sherrod, Dana Borden Lacy, John McLean, Eric Skaar, Aarthi Narayanan, Richard Caprioli, 2019 Chemical and Biological Defense Science & Technology (CBD S&T) Conference, Cincinnati, OH, November 18-21, 2019.
278. “MicroPhysiological Systems: Can Modular Microbioreactors, Automated Perfusion Control, and On-Line Analytics Increase High-Content MPS Study Throughput from Low to Medium?,” FDA Internal MPS and Stem Cell User Group, December 12, 2019.
279. “Multi-Omics and Automated Microfluidic Pumps and Valves for Controlling and Reverse Engineering of Biological Systems,” Symposium on Engineering of Biological Systems, Biophysical Society Annual Meeting, San Diego, CA, February 15, 2020.
280. “Synergistic Engineering of an Ex Vivo Type 2 Diabetes Model – Organoids and Organs on a Chip,” American Diabetes Association’s 80th Scientific Sessions Meeting Planning, June 13, 2020.
281. “The Biological and Technical Challenges of MicroPhysiological Systems: Past, Present, and Future,” SelectBio Organ-on-a-Chip World Congress 2020, Virtual Conference, September 28-30, 2020.

Forthcoming:

282. “Understanding and controlling biology with microfluidic pumps and valves, microphysiological systems, and multiomics,” Scientific Seminar Series at Illumina, Inc., October 1, 2020.
283. “Closing the hermeneutic circle of biology, organ-on-chips, mass spectrometry, and synthetic biology” (plenary lecture), “Organs on Chips: New Tools for Understanding the Complexities of Biology and Medicine” (session chair), 8th Annual International Experimental Biology and Medicine Conference, Memphis, TN, October 8-10, 2021.

INVITED TALKS AND COLLOQUIA AVAILABLE ON THE WEB

“The Homunculi and I: Lessons from Building Organs on Chips,” TEDx Nashville, April 6, 2013:

<https://www.youtube.com/watch?v=4ht3m6p8iZ0>

“Organs-on-chips, metabolomics, systems biology, and closing the hermeneutic circle of biology,” VCR Distinguished Lecture, The University of Tennessee Health Science Center, Memphis, TN, December 15, 2016: <https://mediaserver.uthsc.edu/uthscms/Play/e06b3582a2154ce3ba4ae626a2edd8e91d>

TEACHING ACTIVITIES:

Courses, Materials, and Training Programs Developed

- New demonstrations for pre-med introductory courses
- Course materials for Advanced Undergraduate Laboratory in Living State Physics (with NSF and Vanderbilt University support)
- Multiple undergraduate seminars for Vanderbilt's College Scholars Honors Seminars Program since its inception in 1986, on topics such as *Scientific Revolutions*, *Physics of Technology*, and, most recently, *What is Life?*, and *Why is Biology Complex?*
- "Instrumenting and Controlling the Single Cell: An Education Program in Biomedical Engineering" (supported by a Whitaker Special Opportunity Award, 2003)
- Systems Biology and Bioengineering Undergraduate Research Experience (SyBBURE), 2006-present (supported by gift of Gideon Searle, pledged through 2026, and the Office of the Provost, Vanderbilt University). SyBBURE is an intensively mentored, multi-year, year-round program that guides students in their professional and personal development as scientists and engineers who participate effectively in both independent and collaborative interdisciplinary research. To date, SyBBURE has mentored more than 300 students.
- Graduate Special Topics courses cross-listed in Physics and Biomedical Engineering, such as *Theoretical and Experimental Systems Biology*; *Physical Measurements on Biological Systems*; *Automated Biology: Sensors, Controls, Scaling and Topology*; *Systems Biology of Organs on a Chip*; *Instrumentation for Automated Biology*; *Biomolecular Physics*; and *Systems Biology of the Gut-Brain Axis*. Each of these courses is taught as a Socratic dialogue seminar that draws undergraduate and graduate students from Arts and Science, Engineering, and Medicine, addresses a scientific topic of current interest, and typically produces a review article, a patent application, or a proposal.

GRADUATE DEGREES SUPERVISED:

1. Kenneth R. Swinney, "Techniques for Multipole Expansion of the Electrical Potential of a Heart in a Conducting Sphere and Calculation of the Magnetic Field of a Nerve Axon," M.S., 1979.
2. James K. Woosley, "A Theoretical Study of the Magnetic Field due to the Action Potential of a Single Nerve Axon," M.S., 1983.
3. Mark E. Riecken, "Magnetic Stimulation of Nerves," M.S., 1983.
4. Mary E. Hartson, "The Effect of Thermotolerance on the Radiosensitivity and Thermosensitization of Mammalian Cells," Ph.D., 1984 (With George M. Hahn, Stanford).
5. Bradley J. Roth, Non-Thesis Master of Science, 1985, on "The Magnetic Field of a Single Axon: A Comparison of Theory and Experiment," B.J. Roth and J.P. Wikswo, Jr., *Biophys. J.*, **48**: 93-109 (1985).
6. Dwight P. Russell, Non-Thesis Master of Science, 1985, on "Optimization of State Selection and Focusing of a Neutral Atomic Hydrogen Beam by a Hexapole Magnet," D.P. Russell and J.P. Wikswo, Jr., *J. Physics E*, **18**: 933-940 (1985).
7. Peng Zhang, "Electroless Impedance Measurement," M.S., 1986.
8. Ranjith S. Wijesinghe, Non-Thesis Master of Science, 1987.
9. Bradley J. Roth, "Longitudinal Resistance in Strands of Cardiac Muscle," Ph.D., 1987.
10. Wei-Qiang Guo, Non-Thesis Master of Science, 1987, on "The Effects of Spiral Anisotropy on the Electric Potential and the Magnetic Field Recorded at the Apex of the Heart," B.J. Roth, W.-Q. Guo, and J.P. Wikswo, Jr., *Mathematical Biosciences*, **88**: 191-221 (1988).
11. Ranjith S. Wijesinghe, "Comparison of Electric and Magnetic Techniques for the Determination of Conduction Velocity Distributions of Nerve Bundles," Ph.D., 1988.
12. Julia S. Charles, "Bioelectric Measurements of Bone Using a Magnetic Current Probe," M.S., Electrical Engineering, 1988.

GRADUATE DEGREES SUPERVISED (continued):

13. Renea G. Stasaski, "The Electrophysiological Effects and Biomagnetic Signature of a Crushed Nerve Axon: A Comparison of Theory and Experiment," M.S., Biomedical Engineering, 1989.
14. Jan M. van Egeraat, "Magnetic Aspects of Non-uniform Propagation of Action Signals in Biological Fibers," Ph.D., 1991.
15. Shaofen Tan, "Linear System Imaging and its Applications to Magnetic Measurements by SQUID Magnetometers," Ph.D., 1992.
16. Kevin Kit Parker, "Forward and Inverse Modeling of the Magnetic Fields from Single Motor Unit Compound Action Potentials in Skeletal Muscle," M.S., Mechanical Engineering, 1993.
17. Daniel J. Staton, "Magnetic Imaging of Applied and Propagating Action Current in Cardiac Tissue Slices: Determination of Anisotropic Electrical Conductivities in a Two Dimensional Bidomain," Ph.D., 1994.
18. Leonard Alan Bradshaw, "Measurement and Modeling of Gastrointestinal Bioelectric and Biomagnetic Fields," Ph.D., 1995.
19. Eduardo Parente Ribeiro, "Magnetic Susceptibility Tomography with Superconducting Magnetometer SQUID," Ph.D., Electrical Engineering, PUC-Rio, Rio de Janeiro, 1996 (Academic Advisor: Paulo Costa Ribeiro, Co-advisors: Jacquez Szczupak and John P. Wikswo).
20. Anthony Ewing, "SQUID NDE and POD Using a BEM Measurement Model," Ph.D., Mechanical Engineering, 1997 (with Professor Thomas A. Cruse).
21. Matthew E. Kieron, Jr., "A Spherical Electrode Array for the Detection of Stretch Induced Arrhythmias," M.S., Biomedical Engineering, 1998 (with Professor Robert J. Roselli).
22. Kevin Kit Parker, "Cardiac Bioelectroelastics," Ph.D., Biological and Applied Physics, 1998.
23. Mark-Anthony P. Bray, "Three-Dimensional Visualization of Epifluorescent Cardiac Action Potential Activity," M.S., Biomedical Engineering, 1999.
24. Afshin Abedi, "Magnetic Field Associated with Active Electrochemical Corrosion," Ph.D., 2000.
25. Mark-Anthony Bray, "Visualization and Analysis of Electrodynamics Behavior During Cardiac Arrhythmias," Ph.D., Biomedical Engineering, 2003 (with Marc Lin).
26. Robert Palmer, "BME Signal Processing for Gastromagnetic Fields," Ph.D., Biomedical Engineering, 2005 (with Alan Bradshaw).
27. Marcella Woods, "The Response of the Cardiac Bidomain to Electrical Stimulation," Ph.D., Biomedical Engineering, 2005.
28. Davis Soans, "Biphasic Phased-Array Stimulator," M.S., Biomedical Engineering, 2005.
29. Shawn W. Forrest, "Pacing and the Dynamic Measurement of Potassium Concentration in Whole Rabbit Hearts", M.S., Biomedical Engineering, 2006.
30. Bryan R. Gorman, "Characterization of Transport in Microfluidic Gradient Generators," M.S., Biomedical Engineering, 2007.
31. Shannon L. Faley, "Development of a Novel Microfluidic Platform to Study T Cell Signaling," Ph.D., Biomedical Engineering, 2007.
32. Mark R. Holcomb, "Measurement and Analysis of Cardiac Tissue During Electrical Stimulation," Ph.D., Physics, 2007.
33. Ipshtita Chakraborty, "Characterization of a Passive Diffusion Microdevice for Assays of Chemotaxis and Morphogenesis," M.S., Biomedical Engineering, 2007.
34. Junkai Xu, "Nanocalorimetric Sensor for Ultra-Low Volume Biological Measurement and Calibration by Chemical Method," Ph.D., Physics, 2007.
35. Andrei Irimia, "Multivariate Signal Analysis and Theoretical Modeling for the Study of Gastrointestinal Bioelectromagnetism," Ph.D., Physics, 2007 (with Alan Bradshaw).

GRADUATE DEGREES SUPERVISED (continued):

36. David Mashburn, "Phased Array Stimulation of Cardiac Tissue," M.S., Physics, 2007.
37. Raghav Venkataraman, "A Hollow Fiber Embedded Microfluidic Bioreactor for Recreating *In-Vivo* Nutrient Delivery to Cells," M.S., Biomedical Engineering, 2008.
38. Kweku Addae-Mensah, "A Microfabricated Microcantilever Array: A Platform for Investigation of Cellular Biomechanics and Microforces In Vitro," Ph.D., Biomedical Engineering, 2008.
39. Jason Greene, "Rapid Online Measurement of Amino Acid Fluxes of Continuously Perfused Cells," Ph.D., Interdisciplinary Studies: Biological and Applied Chemistry, 2009.
40. Jenny Lu, "Designing an In-Line Fluorometer for Detection of Cell Polarization," Master of Engineering in Biomedical Engineering, 2010
41. Michael W. Irvin, "Angiogenic Outgrowth from a Perfused Vascular Explant: Design and Implementation of a Perfused Vascular Explant Bioreactor," M.S., Biomedical Engineering, 2012.
42. Walter Georgescu, "Quantifying Cancer Cell Motility in an In Vitro System," Ph.D., Biomedical Engineering, 2012.
43. Christina Marasco, "Technology Platforms for Transforming Complex Biological Studies," Ph.D., Biomedical Engineering, 2012.
44. Ilija Uzelac, "Cardiac Non-Linear Dynamics and Chaos Control in the Cardiac Electrical Activity with Practical Applications," Ph.D., Physics, 2012.
45. Kenneth Drake, "Quantitative Analysis of Cell Signaling and Metabolism," Ph.D., Molecular Physiology & Biophysics, 2015.

PRIOR POSTDOCTORAL TRAINEES:

1. Steven C. Gundersen, Ph.D., Research Associate, "Sequential QRS Vector Subtractions in Acute Myocardial Infarction," 1979-1981.
2. James E. Barnhill, M.D., Cardiology Fellow, "The QRS Complex During Transient Myocardial Ischemia," 1983-1985.
3. Frans L. H. Gielen, Ph.D., Research Associate, "Magnetic Recordings of Action Currents in Nerves and Skeletal Muscle," 1983-1986.
4. Bradley J. Roth, Ph.D., Research Associate, "Magnetic Measurements of Cardiac Action Currents," 1987-1988.
5. Ranjith S. Wijesinghe, Ph.D., Research Associate, "Measurement and Modeling of Compound Action Signals in Nerve and Muscle," 1988-1991.
6. Jan M. van Egeraat, Ph.D., Research Associate, "Magnetic Aspects of Non-uniform Propagation of Action Signals in Biological Fibers," 1991-1992.
7. Yu-Pei Ma, Ph.D., Research Associate, "High-Resolution SQUID Magnetometry for Non-Destructive Testing," 1988-1993.
8. Shaofen Tan, Ph.D., Research Associate, "Mathematical Techniques for Magnetic Imaging," 1992-1993.
9. Ian M. Thomas, Ph.D., Research Associate, "Magnetic Imaging," 1990-1994.
10. Shien-Fong Lin, Ph.D., Research Associate, "Magnetic and Laser/Dye Studies of Propagation of Action Signals in Nerve and Muscle Tissue," 1992-1997.
11. William G. Jenks, Ph.D., Research Associate, "Advanced SQUID Systems for Nondestructive Testing and Biomagnetism," 1993-1997.
12. Jiashin Wu, Ph.D., Research Associate, "Mechanisms of Antiarrhythmic Drug Action," 1993-1997.
13. Daniel J. Staton, Ph.D., Research Associate, "Magnetic and Electric Imaging of Cardiac Action Currents: Anisotropic Conductivities and Tests of the Bidomain Model," 1994-1996.

PRIOR POSTDOCTORAL TRAINEES (continued):

14. Leonard Alan Bradshaw, Ph.D., Research Associate, "Magnetic Fields from Intestinal Electrical Activity," 1996-1998.
15. Anthony P. Ewing, Ph.D., Research Associate, "Non-Destructive Evaluation with SQUIDS," 1997-1999.
16. Petra Baudenbacher, DDS, Ph.D., Research Associate, "Non-Uniform Propagation in Cardiac Tissue," 1999-1999.
17. Grant Skennerton, Ph.D., Research Associate, "Magnetic Imaging of Corrosion Currents," 1998-2001.
18. Veniamin Sidorov, Ph.D., Research Associate, "Cardiac Biophysics," 2001-2004.
19. Mark-Anthony Bray, Ph.D., Research Associate, "A Model of Cardiac Defibrillation," Biomedical Engineering, 2003-2004.
20. Glenn S. Walker, Ph.D., Research Fellow, "Microfluidics for Cellular Studies," 2002-2004 (with Owen McGuinness).
21. Kevin Seale, Ph.D., Research Associate, "Signaling Dynamics in Single Cells and Small Cell Clusters," Biomedical Engineering, 2006-2008.
22. Marcella Woods, Ph.D., Research Associate, "The Role of Heterogeneities in Stimulation of the Cardiac Bidomain," Biomedical Engineering, 2005-2008.
23. Yuxin Liu, Ph.D., Research Associate, "BioMEMs for Systems Biology," 2004-2009.
24. Dmitry Markov, Ph.D., Research Associate, "Advanced Biosensors and Bioreactors," Biomedical Engineering, 2006-2011.
25. Eduardo Andrade Lima, Ph.D., Research Associate, "Instrumentation and Models for High-Speed Measurements of Cellular Electrophysiological and Metabolic Responses," Biomedical Engineering, 2006-2011. (Part-Time)
26. Stacy D. Sherrod, Ph.D., Postdoctoral Research Scholar, "Mass Spectrometry Based Systems Biology," Department of Physics and Astronomy, 2012-2015.
27. Frank E. Block III, Ph.D., Postdoctoral Research Scholar, "Instrumentation for Organs-on-a-Chip," Department of Biomedical Engineering, 2012-2015.
28. Jacquelyn A. Brown, Ph.D., Postdoctoral Research Scholar, Department of Biomedical Engineering, 2014-2015.

CURRENT GRADUATE STUDENTS:

1. Kyle G. Hawkins, Department of Physics and Astronomy, Ph.D. expected May 2022.
2. Nicole Muszynski, Department of Biomedical Engineering, Ph.D. expected May 2022.

CURRENT POSTDOCTORAL TRAINEES:

1. Jonathan D. Ehrman, Ph.D., Postdoctoral Research Scholar, Department of Physics and Astronomy, Systems Biology and Bioengineering Undergraduate Research Experience, 2017-present.

PRIOR RESEARCH AND TEACHING FACULTY MEMBERS:

1. Hesam Sadeghi, Ph.D., Research Assistant Professor, "SQUIDS for Non-Destructive Evaluation," 1992-1992.
2. Richard N. Friedman, Ph.D., Research Assistant Professor, "Magnetic Measurements of Nerves and Muscles," 1988-1993.
3. Nestor G. Sepulveda, Ph.D., Research Assistant Professor, "Finite Element Calculations of Bioelectric Potentials, Currents, and Magnetic Fields," 1984-1994.
4. Shien-Fong Lin, Ph.D., Research Assistant Professor, "Magnetic and Laser/Dye Studies of Propagation of Action Signals in Nerve and Muscle Tissue," 1997-2001.

PRIOR RESEARCH AND TEACHING FACULTY MEMBERS (continued):

5. Rubin Aliev, Ph.D., Research Assistant Professor, "Computational Bioelectrodynamics," 1997-2002.
6. Franz J. Baudenbacher, Ph.D., Research Assistant Professor, "High-Resolution SQUID Magnetometers and Cardiac Imaging," 1997-2003.
7. Yu-Pei Ma, Ph.D., Research Assistant Professor, "High-Resolution SQUID Magnetometry for Non-Destructive Testing," 1993-2003.
8. Leonard Alan Bradshaw, Ph.D., Research Assistant Professor, "Magnetic Fields from Intestinal Electrical Activity," 1998-1999.
9. Momchil Velkovsky, Ph.D., Research Assistant Professor of Physics, "Metabolic Dynamics," 2004- 2008
10. Yuxin Liu, Ph.D., Research Assistant Professor, "BioMEMs for Systems Biology," 2009-2009.
11. Kevin T. Seale, Ph.D., Assistant Professor of the Practice of Biomedical Engineering, "The Systems Biology and Bioengineering Undergraduate Research Experience," 2011-2014.

CURRENT RESEARCH AND TEACHING FACULTY MEMBERS:

1. Veniamin Y. Sidorov, Ph.D., Research Assistant Professor of Biomedical Engineering, "Cardiac Biophysics," 2004-present
2. Christina Marasco, Ph.D., Associate Professor of the Practice of Biomedical Engineering, "The Systems Biology and Bioengineering Undergraduate Research Experience," 2014-present
3. Eric C. Spivey, Ph.D., Research Assistant Professor of Biomedical Engineering, "Design, Construction, and Implementation of Novel Cell Handling Devices Used in the Study of Mechanism of Action of Toxins on Cells," 2016-present (appointment shared with Department of Biochemistry)
4. Shannon L. Faley, Ph.D., Research Assistant Professor of Biomedical Engineering, "Cellular Bioengineering and the Vascularization of Organs-on-Chips," 2018-present

CURRENT VIIBRE SCIENCE AND ENGINEERING GROUP:

1. Jacquelyn A. Brown, Ph.D., Staff Scientist, 2015-2016; Senior Staff Scientist, 2017-present; Director, VIIBRE Automated Micro-Organ Systems (AMOS) Core, 2016-present
2. Clayton M. Britt, B.S., Research Assistant, 2014-2016; Research and Development Engineer, 2016-present
3. Monika Judge, Research Assistant, 2015-2018; Laboratory Manager, 2018-present
4. Gregory B. Gerken, B.S., M.S., M.B.A., Research and Development Engineer (Software), 2014-present
5. Michael Geuy, B.S., Research and Development Engineer, 2017-present
6. Ronald S. Reiserer, Laboratory Manager, 2002-present
7. Philip C. Samson, Research and Development Engineer, 2004-2008; Senior Research and Development Engineer, 2008-2012; Chief Research and Development Engineer, 2012-present (part-time 2018-present)
8. David K. Schaffer, B.E., M.S., Research and Development Engineer and Manager, Vanderbilt Microfabrication Core (VMFC)
9. Patricia Ward, B.S., M.S., Research Assistant, 2019-present

REPORTS:

1. Magnetic Shielding and the Adjustment of Remanence, J.P. Wiksw, Jr., Stanford Low Temperature Physics Group Report, SLTP-1972-2 (1972).
2. Non-Invasive Magnetic Measurement of the Electrical and Mechanical Activity of the Human Heart, J.P. Wiksw, Jr., Ph.D. Dissertation, Dept. of Physics, Stanford University (1975).
3. A Guide to Scalar Multipole Expansions, J.P. Wiksw, Jr., Report PAS-78-36, David W. Taylor Naval Ship Research and Development Center, Bethesda (1978).
4. Application of Sensitivity Vectors to the Measurement and Modeling of Magnetostatic Fields, J.P. Wiksw, Jr., Report PAS-79-1, David W. Taylor Naval Ship Research and Development Center, Bethesda (1979).
5. An Advanced Undergraduate Laboratory in Living State Physics, J.P. Wiksw, Jr., B. Vickrey, and J.H. Venable, Jr., Department of Physics and Astronomy, Vanderbilt University (1980), 265 pages.
6. Application of Adaptive Filters to Enhancement of Geomagnetic Data, M.C. Leifer, J.P. Wiksw, Jr., and E.J. Iufer, Department of Physics, Stanford University, and the NASA Ames Research Interchange (1981).
7. An Intermediate Physics Laboratory, J.P. Wiksw, Jr. and M.S. Webster, Eds., Department of Physics and Astronomy, Vanderbilt University (1988).
8. Report of the College Ad Hoc Committee on the Microcomputer Store, J.P. Wiksw, Department of Physics and Astronomy, Vanderbilt University (1988).
9. The Physics of Technology: A Hypercard Approach, J.P. Wiksw, Jr. and C.T. Black, Eds., Department of Physics and Astronomy, Vanderbilt University (1990).
10. Imaging of Small Defects in Nonmagnetic Tubing Using a SQUID Magnetometer, D.C. Hurley, Y.P. Ma, S. Tan, and J.P. Wiksw, Jr., Manufacturing Technologies Laboratory, 92CRD072, G.E. Research & Development Center (1992).
11. Reintroducing Introductory Physics, C. Kurtz, G. Ray, J. Wells, and J.P. Wiksw, Jr., Department of Physics and Astronomy, Vanderbilt University (1992).
12. An In-depth Review of the Vanderbilt University Patent Policy and Recommendations for its Replacement by a Policy on Technology and Literary and Artistic Works, Vanderbilt University Patent Committee (1993), 63 pages.
13. SQUID Detection of Deep Flaws in Aluminum Plates, Y.P. Ma and J.P. Wiksw, Jr., Report VEL1996-2, Alcoa Technical Center (1996).
14. High Resolution Superconducting Magnetometry for Nondestructive Evaluation, W.G. Jenks, Y.P. Ma, and J.P. Wiksw, Jr., EPRI TR-108649, Final Report, Electric Power Research Institute (1997).
15. Appointments, Promotion, and Tenure - 1997, A Report to the Provost by the Committee on Appointments, Promotion, and Tenure (CAPT), 200 pages.
16. Testing of Stator Windings for Thermal Aging, Y.P. Ma and J.P. Wiksw, Jr., EPRI 1000376, Final Technical Report, Electric Power Research Institute (2000).
17. A Strategic Academic Plan for the College of Arts and Science - 2001, A Report to Dean John H. Venable by the Senior Steering Council for the Strategic Academic Plan, College of Arts and Science (SAP-CAS), 225 pages, <http://www.vanderbilt.edu/AnS/strategic/>.
18. Life Sciences Modeling Strategic Planning Final Report, Vanderbilt University, January 7, 2007, <http://dbmichair.mc.vanderbilt.edu/lsm/> (Peter Cummings and Daniel Masys (co-chairs), Vito Quaranta, Glenn Webb, Thomas Weiler, and John Wiksw)

Biographical Sketch:

John P. Wikswo, Ph.D., received the B.A. degree in Physics from the University of Virginia and the M.S. and Ph.D. degrees in Physics from Stanford University. He was a Research Fellow in Cardiology at the Stanford University School of Medicine from 1975 to 1977. He joined the faculty in the Department of Physics and Astronomy at Vanderbilt University as an Assistant Professor of Physics in 1977. He is now the Gordon A. Cain University Professor, A. B. Learned Professor of Living State Physics, Founding Director of the Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE), and Professor of Biomedical Engineering, Molecular Physiology & Biophysics, and Physics. He has been a Woodrow Wilson Fellow, an NSF Predoctoral Fellow, a Bay Area Heart Research Committee Fellow, an Alfred P. Sloan Research Fellow, and a John Simon Guggenheim Fellow. He is a Fellow of the American Physical Society, the American Institute for Medical and Biological Engineering, the American Heart Association, the Council on Basic Cardiovascular Sciences of the American Heart Association, the Biomedical Engineering Society, Heart Rhythm Society, the Institute for Electrical and Electronic Engineers, and the American Association for the Advancement of Science. In 1997, he received the Thomas Jefferson Award from Vanderbilt University for service to the university. He has received two R&D 100 Awards: in 1984 (then the IR-100 Award) for the Neuromagnetic Current Probe, and in 2017 for the MultiWell MicroFormulator. To date, he has directed twenty-four Ph.D. degrees and twenty-one M.S. degrees by a total of forty-one graduate students, and mentored twenty-eight postdoctoral trainees and eleven research or teaching assistant professors. More than 120 undergraduates have worked on research projects in his group. At present, he is advising two graduate students, one postdoctoral research associate, four research or teaching faculty members, and a large research and engineering staff. He has published more than 230 research articles and book chapters and approximately 400 conference papers, abstracts, and reports. He holds thirty-five issued patents and is an inventor in more than a dozen pending patent applications.

For the past 45 years, John Wikswo has worked on measurements and modeling in biological physics, bioengineering, and electrophysiology, initially at the scale of humans and dogs, then with rodents, and more recently at the level of nanoliter bioreactors and individual cells. He explored in depth the relationship between cardiac electric and magnetic fields and the generation of the vector magnetocardiogram. With his collaborators, he made the first measurements of the magnetic field of a single axon and a single skeletal muscle fiber. All of these studies provided key insights into the parameters that relate the intracellular action currents to the transmembrane potential and extracellular electric and magnetic fields. His group played a central role in demonstrating the part performed by tissue anisotropy in the response of cardiac tissue to defibrillation-strength electric shocks and the behavior of cardiac virtual electrodes, which are explained by the doubly anisotropic bidomain of cardiac electrical activity. He demonstrated the contribution of fiber tissue architecture to the information content of the magnetocardiogram. He also participated in pioneering magnetic measurements of the magnetoenterogram, a non-invasive recording of the magnetic field of the electrical activity in the human gastrointestinal tract, a technique that is now used regularly in clinical studies at Vanderbilt. He spent a decade exploring the capabilities of superconducting quantum interference device (SQUID) magnetometers for non-destructive testing of plastics, electric power generation hardware, and corroding aluminum.

He is the founding Director of the Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE), which was created in 2001 with a \$5 million, five-year grant from the Vanderbilt Academic Venture Capital Fund to foster and enhance interdisciplinary research in the biophysical sciences, bioengineering, and medicine at Vanderbilt. Within VIIBRE, he has focused on building on-campus collaborations to use microfabrication to create and utilize devices to instrument and control single cells and small collections of cells, and to provide data for parameterization of models of biological processes. VIIBRE has developed a breadth of optical and electrochemical instruments, mass spectrometry techniques, and software for studying how living cells interact with each other and their environment and respond to drugs, chemical and biological agents, and other toxins, thereby providing insights into systems biology, physiology, medicine, and toxicology. Since 2001, VIIBRE has played a central role in bringing to Vanderbilt grants and

contracts totaling more than \$90 million. VIIBRE is also the home of the Systems Biology and Bioengineering Undergraduate Research Experience (SyBBURE), a year-round, multi-year program funded by Gideon Searle that has mentored more than 300 undergraduate students over the past thirteen years.

John Wikswo's personal research effort focuses on systems biology and systems engineering, primarily from the perspective of organs-on-a-chip and the optimization of automated systems for combined experimental control and inference of quantitative metabolic and signaling models to help us better span the breadth of spatiotemporal scales of systems biology, toxicology, and pharmacokinetics and pharmacodynamics. In this context, he and his colleagues are actively developing microfabricated systems for measuring cellular properties and controlling cellular behavior, fabricating biomedical devices and large-scale instruments, and developing and applying mathematical models of cellular signaling and metabolism to analyze data and design experiments. Beginning with a 2009 Defense Threat Reduction Agency (DTRA) grant, his group has been developing low-cost microfluidic pumps and valves and controllers for maintenance of trapped cells, organs-on-chips, and bioprinted tissues, directed towards a universal, disposable, modular microfluidic platform that could be used to create an *in vitro* micro-homunculus. In addition to DTRA, this effort has been supported by the Defense Advanced Research Projects Agency (DARPA); the National Institutes of Health (NIH) National Center for Advancing Translational Sciences (NCATS), National Institute of Neurological Disorders and Stroke (NINDS), and Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD); the Environmental Protection Agency (EPA); the National Aeronautics and Space Administration (NASA); and industry.

Research Interests:

I joined Vanderbilt in 1977, fresh from graduate and postdoctoral work studying the cardiac magnetic field at Stanford University in the Division of Cardiology and the physics laboratory of William Fairbank. My goal was to build a program in the measurement of biological magnetic fields and make the first measurement of the magnetic field of an isolated nerve, which John Barach, John Freeman, and I accomplished by 1980. More than a dozen years of support by the Office of Naval Research, the NIH, and the Veterans Administration led to the first measurements of the magnetic field of a single nerve axon and other studies that provided, for the first time, a firm biophysical foundation for the production and detection of the magnetoencephalogram and other biomagnetic signals.

By the late 1980s, I recognized that the holy grail of biomagnetic measurements, biological activity that was detectable magnetically but was electrically silent, would be hard to find in one-dimensional systems. I was the first to recognize that the usually ignored differences in the electrical anisotropy between the intracellular and extracellular spaces of a sheet of cardiac tissue would lead to just such a situation. I had to devise a new class of Superconducting Quantum Interference Device (SQUID) magnetometers that had the spatial resolution and sensitivity required to detect these fields and raise the \$300,000 to get the instrument built; by 1991 my group had found the desired field pattern and devised magnetic imaging algorithms that have become the gold standard in the field. We recognized that the same instrumentation, scanning stages, and analysis algorithms could detect flaws in metals and plastics, and we mounted a 10-year program that was funded by the Air Force Office of Scientific Research (AFOSR), private industry, and the German government. This work evolved into an AFOSR-sponsored initiative and produced the only technique yet known that can measure the instantaneous rate of corrosion occurring inside an aging aircraft lap joint. This work in turn attracted long-term support from the Air Force. As our understanding grew, we found that the mathematical models of electrically and magnetically silent fields applied not only to cardiac muscle but also riveted aluminum, with the conclusion that magnetically silent currents in an aircraft lap joint would confound the magnetic imaging of the total current density produced at a corrosion interface.

Meanwhile, with colleagues in the Vanderbilt University Medical Center, I began measuring *in vivo* the cardiac conduction velocity during ischemia and infarct and in the presence of antiarrhythmic drugs. During one of these experiments, I recognized the existence of virtual cathodes in cardiac tissue, which happened to be related to the same anisotropy differences that produced the magic magnetic fields. The cardiac community

paid little notice until my collaborators and I showed that these anisotropy differences and associated virtual cathodes and anodes could explain an old puzzle in cardiac electrophysiology, produce a previously unrecognized form of cardiac reentrant activation, and provide key mechanisms for understanding the success or failure of cardiac defibrillation. This work also led us into the non-linear dynamics of cardiac stimulation. A collaboration with Bradley Roth led to our experimental validation of more than eight of his twenty-one bidomain model predictions, demonstrating the power of his models and our measurements.

The continuing exploration of biomagnetic measurements picked up another first, the magnetic field of intestinal smooth muscle, which has spawned a large, well-funded, and productive collaboration with Bill Richards and Alan Bradshaw that has developed SQUID measurements into the first non-invasive clinical tool for the diagnosis of acute mesenteric ischemia and other gastrointestinal disorders.

The quest for the higher spatial resolution SQUIDs led me to recruit Franz Baudenbacher to lead an NSF- and NIH-funded project that has produced the world's best SQUID microscope and used it in an experiment, in collaboration with a geobiology group at Caltech, to characterize the thermal history of a Martian meteorite from its magnetic signature and show that material could be transported from Mars to Earth without sterilization. This NanoSQUID has the potential to revolutionize the magnetic measurement of geophysical samples, and it allowed us to record beautiful data of the electrically silent magnetic fields of currents propagating through cardiac tissue, made possible by productive excursions into geophysics and NDE!

In 2000, I decided that I wanted to refocus my interests toward biology, and with the support of a \$5 million, five-year grant from the Vanderbilt Academic Venture Capital Fund I founded the Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE) to foster and enhance interdisciplinary research in the biophysical sciences, bioengineering, and medicine at Vanderbilt. VIIBRE is an autonomous, self-supporting research institute comprised of multiple of self-governing project teams with independent funding, complementary scientific themes, and shared core technologies and facilities. As soon as a scientific, technical, or funding opportunity is identified, a project team is formed, and the team leaders meet regularly to pursue funding, allocate shared resources, and define and guide the research effort. A team may be as small as a single faculty member guiding an undergraduate and a graduate student with the support of a VIIBRE staff member, or a staff member working with a single undergraduate, or as large as several research groups spanning Arts & Science, Engineering, and Medicine at Vanderbilt, or a multi-investigator project involving large research groups at several different institutions or companies. In each case, the teams are formed and evolve, and resources are allocated in a dynamic fashion, adjusting to individual interests, research results, funding, and the progress of students in the course of their undergraduate or graduate education. Our mission and vision – to invent tools and techniques required to understand biological systems across spatiotemporal scales, and to focus research and education on an integrated multidisciplinary approach to microscale engineering and instrumentation for dynamic control and analysis of cellular systems – is being carried out by a cadre of faculty members at Vanderbilt and other institutions worldwide, postdocs, high school, undergraduate, and graduate students, and staff members, who work together on a broad range of projects that explore the interfaces at the intersections of physics, chemistry, engineering, biology, and medicine.

This effort has been highly successful. By 2020, we had twice accomplished our original ten-year goal of using this investment to bring Vanderbilt to the forefront of cellular instrumentation and control, with the first decade focusing on simple microfluidic instrumentation and, building upon that foundation, a second mounting an intense, multi-institutional effort in organs-on-chips. We have used microfluidics, computer control, analytical chemistry, and mathematical modeling in projects such as cellular biosensors, nanoliter bioreactors, chemotaxis devices, and models for cancer and toxicology research; identification of chemical and biological warfare defense agents and infectious pathogens; new technologies for tracking metabolic and signaling dynamics, particularly using ion mobility-mass spectrometry; biomedical imaging; cellular/tissue bioengineering; development of microfabricated devices for measuring cellular properties and controlling cellular behavior; custom digital and analog electronics; replica casting and injection molding of microfluidic devices; fabrication of large-scale instruments and biomedical devices; data analysis; design of experiments;

development and application of mathematical models; and inference of drug mechanism of action. Our group has pioneered the use of microfabricated multitrap nanophysiometers for studying metabolism and signaling in immune cells. We are now concentrating our efforts on organ-on-chip perfusion control systems and instrumented microbioreactors for engineered tissue-constructs.

My personal research effort focuses on systems biology, primarily from the perspective of organs-on-chips and optimization of automated systems for combined experimental control and inference of quantitative metabolic and signaling models to better span the spatiotemporal scales of systems biology. For two decades, my group has been developing microfluidic devices to solve problems relevant to human biology, medicine, and environmental toxicology, and miniature, low-cost pumps and valves for maintenance of organs-on-chips. In collaboration with AstraZeneca, we developed a 96-channel MicroFormulator to individually address each well of a 96-well plate so as to deliver drugs and remove metabolites with a realistic pharmacokinetic time course. This “MultiWell Micro-Formulator” received a 2017 R&D 100 award, and it is now licensed to CN Bio Innovations, which expects to release a commercial product in 2020. I am collaborating with CFD Research Corporation under an NCATS SBIR grant to further refine this MicroFormulator technology and create SmartLids that can either control each well of a 24-Transwell plate for 24 of CFDR’s micro-organs or provide automated multi-week perfusion of printed tissues in Transwell plates. My group has made substantial progress toward a universal Integrated Organ Microfluidic platform for organs-on-chips that includes sophisticated microfluidic pumps and valves, sensors, and computer control.

I consider my contributions to science to fall into six areas:

Organs-on-Chips: Microphysiological systems, consisting of interacting organs-on-chips or tissue-engineered, 3D organ constructs that use human cells, present an opportunity to bring new tools to biology, medicine, pharmacology, physiology, and toxicology. The initial motivation for creating microphysiological systems was to increase the speed, efficiency, and safety of pharmaceutical development and testing, paying particular regard to the fact that neither monolayer monocultures of immortal or primary cell lines nor animal studies can adequately recapitulate the dynamics of drug-organ, drug-drug, and drug-organ-organ interactions in humans. My group’s work on organ-on-chips focuses on the development of modular, microprocessor-controlled motors that drive microfluidic pumps and valves that can be interconnected to create perfusion controllers, microclinical analyzers, and microformulators. We are developing a blood-brain barrier on a chip and an engineered cardiac tissue construct on a chip, and integrating multiple organs to create a micro-human from coupled organs on chips. I have authored a number of detailed microphysiological systems reviews and am the editor of two thematic issues of *Experimental Biology and Medicine* on microphysiological systems published in 2014 and 2017. The hermeneutic circle on the cover of the journal comes from my introduction to the 2014 issue.

Microfluidics: In 2000, I identified that the use of microfluidics for cellular sensing and control within a decade could become a major tool in integrative physiology, systems biology, and biological physics. As my research interests turned toward cellular biology, my central research focus became the invention of the tools and techniques required to understand biological systems across spatiotemporal scales. Given the importance of spatial effects at the cellular scale, microfabrication proved to be a critical tool. My group has developed a diverse set of microfluidic devices and mathematical models, sophisticated instruments, biomedical imaging, and new methodologies for instrumenting and controlling single cells and small cell populations, and for providing data for parameterization of biological process models. Building upon my first decade of work with microfluidic bioreactors and devices for measuring cell migration, primarily for cancer research, my work over the past ten years has been focused on reducing the costs and increasing the capabilities and ease-of-use of the microfluidic pumps and valves that will be needed for the perfusion and controlled interconnection of organs-on chips. This work, published primarily in the patent literature, should ultimately have a significant contribution to science as we demonstrate and disseminate our new technologies. The MultiWell MicroFormulator cited above is proving to have a wide variety of applications.

Mass Spectrometry: Long-term interests in combining experiments and mathematical modeling led me to systems biology, primarily using microfluidics and organs-on-chips. Electrochemical measurements can provide real-time measurements of bioenergetic dynamics, but only a limited number of variables (e.g., glucose, lactate, oxygen, pH, etc.). Ultrapformance liquid chromatography-ion mobility-mass spectrometry can provide daunting quantities of dynamic data. I have championed the use of Kohonen self-organizing heat maps in untargeted metabolomic searches to identify species that exhibit significant temporal or experiment-to-experiment differences. As a member of Vanderbilt's DARPA-funded Rapid Threat Assessment (RTA) team, I worked on the development of omni-omic techniques to identify a drug's mechanism of action in 30 days. Our 2017 paper (Norris et al., *J. Proteome Res.* 16:1364-1375) made a significant addition to the mechanism of action of cisplatin.

Neuromagnetism and Magnetic Imaging: Even after a decade of intense research into the magnetoencephalogram (MEG) by a number of groups worldwide, there was great uncertainty as to the cellular sources of these fields. Beginning in 1977, I launched an effort to detect and analyze in depth the magnetic field from nerve axons. We began using a SQUID magnetometer with a room-temperature pickup coil. We then developed room-temperature amplifiers that could record from single giant axons from crayfish and squids and single frog skeletal muscle fibers. My group perfected the magnetic measurement of conduction velocity histograms of human peripheral nerves and demonstrated this as an intraoperative tool for peripheral nerve repair. Experimental and computational studies provided a quantitative understanding of the cellular sources of the MEG. This work led to extensive studies of magnetic imaging of biological and physical systems. While my work continues to be highly cited, I am no longer active in this area.

Cancer Research: The majority of my initial work in applying microfluidics to cell biology was directed toward cancer research, primarily addressing single-cell behavior and the connection between signaling gradients and cellular chemotaxis. With the development of the MultiAnalyte MicroPhysiometer by Dr. David Cliffl's and my groups, we began to study cellular metabolic activity, which is clearly of interest to cancer research. That work motivated my productive collaboration with Dr. John McLean on mass spectrometry for metabolomics. My collaborations with Drs. Lisa McCawley, Dmitry Markov, and Ann Richmond have strengthened as we developed advanced microfluidic devices and moved toward the study of cell behavior in 3D matrices. Our microfluidic perfusion controllers and organ-on-chip microbio-reactor technologies have been maturing in parallel, with the recognition that the ability of these platforms to perfuse tissue for long periods of time makes them ideal for studying cancer growth. Coupled organ systems are enabling the study of cancer metastasis. All of these technologies have been coming together, for example, with our major NCATS-funded collaboration between the NIH CTSA programs at Vanderbilt, Pittsburgh, and Wisconsin ("Harnessing Human Brain and Liver Microphysiological Systems for Testing Therapeutics for Metastatic Melanoma").

Cardiac Bidomain and Virtual Electrodes: My most significant scientific accomplishment is the first convincing demonstrations of the role of the electrical anisotropy of the cardiac bidomain in both the generation of the cardiac magnetic field, and, more important, the defibrillation of cardiac tissue. With colleagues at Vanderbilt, I began to measure cardiac conduction velocity changes in the *in vivo* canine heart during ischemia and infarct and in the presence of antiarrhythmic drugs. During an experiment using a dog model, I discovered the existence of 2D virtual cathodes in cardiac tissue and saw that they were related to the same anisotropy differences that produced the peculiar cardiac magnetic fields. The clinical importance became evident several years later when we showed that these anisotropy differences and the associated virtual cathodes and anodes could explain an old puzzle in cardiac electrophysiology, produce a previously unrecognized form of cardiac reentrant activation, and provide key mechanisms for understanding the success or failure of cardiac defibrillation. The results are remarkably consistent with extensive numerical calculations by my group and later by my former Ph.D. student Bradley Roth, and provided for the first time a clear identification of the common mechanism that allows cardiac tissue to be stimulated by both cathodal and anodal make and break stimuli, in contrast to nerves that can be stimulated by either cathode make or anode break, but not the other two modes. My group's 2013 paper (Woods et al., *Biophys. J.*, 105:523-532) used

strong, short-duration shocks to provide a key step toward understanding how microvascular heterogeneities create distributed virtual cathodes and anodes responsible for defibrillation. My recent cardiac efforts focus on a cylindrical, three-dimensional engineered cardiac tissue construct that supports coordinated measurements of electrical signals, calcium activation, active and passive length-tension relationships, untargeted metabolomic analysis, and the parameterization of elastomechanical Hill models.

Research Facilities: \

Over the past 45 years, I have created a series of laboratories and experimental capabilities ideally suited for biophysical, bioengineering, and physiological studies on humans, whole animals, isolated tissue, and cells. The capstone of this effort is the Vanderbilt Institute for Integrative Biosystems Research and Education, (VIIBRE). VIIBRE is located on the first and eighth floors of Building 6 of the Stevenson Center for the Natural Sciences and Engineering, where it occupies a total of ~9,000 square feet immediately adjacent to the Departments of Chemistry, Physics, Biomedical Engineering, and the Vanderbilt University Medical Center.

The Vanderbilt MicroFabrication Core (VMFC) laboratory operates within the Agilent iLab Management System to provide the University and its collaborating institutions with microfabrication services and device development. The VMFC has three Class-100 clean rooms, totaling 550 sq. ft., that are equipped to perform standard micromachining techniques, including thin-film deposition, photolithography, etching, chemical vapor coatings, and surface modification, with an emphasis on constructing hybrid soft-lithographic microfluidic devices with thin-film and optical sensors. An additional room is devoted to wet sample processing and chemical etching, and the VIIBRE machine shop has computerized tools, including a CNC milling machine and an injection molding system, used to make molds for microfluidic devices and systems. A recently upgraded space enables the 3D printing of high-fidelity prototypes from various thermoform plastics and light-cured resins as well as cell-laden and inert gels (bioprinting). The VMFC has a published, University-audited fee structure and can provide a range of technical design and fabrication services, as well as fabricated components, complete systems, and controls. Outside collaborators have full access to VMFC services and devices through iLab.

The Cellular Instrumentation and Control Laboratory is dedicated to high-bandwidth (*i.e.*, rapid temporal response) studies of the dynamics of cellular signaling and metabolism. A particular focus is paid towards cell-based biosensors and using soft-lithographic MEMS fabrication techniques to create silicone-based elastomeric microreactors and nanophysimeters that measure simultaneously, from a small population of cultured cells in microliter to sub-nanoliter cell-culture chambers, oxygen consumption, extracellular pH, glucose consumption, lactate production, and release of specific small molecules, intracellular quantities such as oxidation/reduction potential, transmembrane potential, calcium concentration, and the expression of selected chemokines. The VIIBRE cellular instruments are created using state-of-the-art multichannel potentiostats, inverted microscopes, computer-controlled micropumps and microvalves, and high-speed CCD and photodiode fluorescence imaging systems. Active pump and feedback controls are being developed to maintain long-term cell health in the highly restricted nanoliter and microliter culture volumes, particularly in support of national organ-on-chip programs. Most notable are the NeuroVascular Unit (NVU), which recapitulates the blood-brain barrier (BBB) and is enabling quantitative studies of the interactions between human neurons, endothelial cells, pericytes, and astrocytes, and the I-Wire engineered cardiac tissue construct (ECTC), which enables quantitative measurements of the active and passive elastomechanical properties of ECTCs and other tissue constructs. VIIBRE's MultiWell MicroFormulator is enabling studies of controlled differentiation of human induced pluripotent stem cells and *in vitro* recapitulation of human and animal pharmacokinetics and circadian rhythms, and should enable a 10,000-channel microchemostat.

VIIBRE's Automated Micro-Organ Systems (AMOS) Core operates within the Agilent iLab Management System to enable the University and its collaborating institutions to commission, on a fee-for-service basis, experimental assays using VIIBRE's organ-on-chip platforms. The NeuroVascular Unit (NVU) is already in use by projects funded by the NIH National Center for Advancing Translational Sciences and other sponsors. More than 600 NVU devices have been produced for internal use or delivery to external

collaborators, including the Cleveland Clinic, the University of Pittsburgh, Johns Hopkins University, the Massachusetts Institute of Technology, Texas A&M University, Baylor College of Medicine, Imperial College in London, the Environmental Protection Agency, and George Mason University. Mammary gland (developed by Dr. Lisa McCawley et al.) and cardiac papillary/trabecular muscle organ chips (developed by Drs. Veniamin Sidorov and John Wikswo) are newly available. Rates for these services have been set based upon a University cost audit.

Fabrication, assembly, and testing of the organ-on-chip modules required for AMOS studies are conducted by the VMFC, and experimental assays are performed by VIIBRE research staff within the Human Organ-Chip Cell Culture Suite described below. Through Dr. John McLean's Center for Innovative Technology, a microfluidics-enabled high-content screening system is available for high-resolution, full-extent confocal mapping and 3D visualization of macroscopic tissue-engineered constructs such as brain, liver, heart, bone joint, kidney, gut, and adipose tissue. Other high-content microscopes available through the Vanderbilt cores are also being used. Gut-on-a-chip microbioreactors are being developed in collaboration with Drs. Melissa Farrow, Jeremy Norris, and Richard Caprioli for multi-omic determination of the mechanism of action of drugs, environmental toxins, and chemical warfare agents and their therapeutics and prophylactics.

VIIBRE's Human Organ-Chip Cell Culture Suite occupies six renovated laboratories, totaling 2,000 sq. ft., on the first floor of Building 6 of the Stevenson Center. This sophisticated facility for the assembly, testing, and use of organ-on-chip modules includes 700 sq. ft. of HEPA-filtered BSL-2 space for long-term organ-on-chip culture. A dedicated room in this suite is equipped for tissue culture and includes two biosafety hoods, seven incubators, cooled centrifuges, and a separate gowning area. The capabilities of this space were recently expanded to accommodate the AMOS-conducted NVU studies. Adjacent to this space and to the VIIBRE Cardiac Imaging Laboratory (described below) is a remodeled, 140 sq.-ft. room equipped for creating our engineered cardiac tissue constructs (ECTC), *i.e.*, papillary muscles-on-a-chip, complete with incubators, centrifuges, a biosafety cabinet, refrigerators, and other equipment.

The Cardiac Imaging Laboratory is dedicated to the development and application of advanced optical and magnetic instrumentation for biophysical measurements. It is equipped for electrical and biochemical imaging of whole-heart and engineered cardiac tissue and cellular preparations, and has two dedicated fluorescence imaging suites with physiological support systems, lasers, and high-speed cameras, one of which is configured for three-camera panoramic imaging. One of the labs contains animal and chemical preparation areas.

General VIIBRE Laboratories include a biochemistry laboratory, a conference room, a cold-room, a darkroom, well-equipped electronics and machine shops, a microdevice assembly area, and a laboratory services room. In addition to its own shops staffed by a full-time technician, VIIBRE is a regular user of the Natural Science Division Machine Shop, also in Building 6, which is staffed by a full-time instrument maker and has three- and four-axis CNC milling machines and multiple lathes and other machines that are used regularly to produce hardware components for VIIBRE's Perfusion Controllers, MicroClinical Analyzers, and MicroFormulators, as well as precision molds for integrated microfluidic pump and valve chips.

VIIBRE has used its extensive microfabrication and mechatronic capabilities to establish various Core Technologies that are directly relevant to cell and developmental biology, cancer, biodefense, and infectious disease detection. These include multianalyte MicroClinical Analyzers with capabilities for simultaneous measurement of glucose, lactate, oxygen, ammonia, potassium, and several neurotransmitters; 24- and 96-channel MicroFormulators that can be used for independent control in each well of pharmacokinetic exposure profiles, circadian rhythms, stem cell differentiation, and cancer de-differentiation; Perfusion Controllers for long-term perfusion of organ chips, including a NeuroVascular Unit-on-a-Chip; nanophysimeters for measurements on single cells; gradient migration chambers; beds-of-nails for traction force microscopy; high porosity nanofilters for cellular perfusion and other applications; nanobioreactors for perfusing small populations of cells in multiple cell traps; thick tissue bioreactors for tissue explants and supporting

microphysiological organoids; and other integrated organ microfluidics (IOM) modules.

Education and Training:

I have directed 24 Ph.D. degrees and 21 M.S. degrees by a total of 41 graduate students, and mentored 28 postdoctoral trainees and 11 research assistant professors. More than 120 undergraduates have worked on research projects in my group. At present, I am advising two graduate students, one postdoc, four research or teaching faculty, and a large research and engineering staff. I nurture innovation and transdisciplinary collaboration in my group, and together we have published more than 200 articles in peer-reviewed journals and 50 commentaries, reviews, methods papers, and book chapters. Our inventions have resulted in 35 issued patents, several of which have been licensed, and more than a dozen pending patent applications.

My teaching philosophy can be embodied in three quotations: “The mind is not a vessel to be filled but a fire to be kindled” (Plutarch); “You cannot teach a man anything; you can only help him to find it within himself” (Galileo); and “Education is what survives when what you have learned is forgotten” (B. F. Skinner). My teaching also reflects my upbringing and interests. I am an experimental physicist, engineer, and physiologist. I love to build and play with gadgets, help people learn to build things, and figure out and explain how things work – vocations I trace to my childhood. My father, an industrial research chemist and master equally of all trades and the Socratic method, started building a 16-inch telescope when I was five. During my 15-year apprenticeship to this and other projects, I learned the how and wherefore of everything from mirror grinding to plumbing. (Our telescope and observatory were featured in *Scientific American* in April, 1970.) My mother, a college mathematics professor, shared with me her love for teaching. When I was in fourth grade, I explained to one of her classes a binary adding machine I had assembled. In high school I explained things the teachers didn’t understand to my algebra and physics classmates. As an undergraduate at the University of Virginia, I had another remarkable mentor in Professor Bascom Deaver, who hired me as a technician to equip his new low temperature physics laboratory, guided me as I taught myself experimental physics and cryogenic engineering, and encouraged me to work with his mentor at Stanford, William Fairbank. My belief in learning by doing and by teaching was deepened when my wife and I taught our children at home for a few years. I observed not only the various ways that humanists and scientists approach the world, but also how different people think and learn. Watching our children explain things to each other and their friends convinced me that students learn by explaining. I can even cite professional pedagogical influences, such as Richard Light’s *The Harvard Assessment Seminars* (which I often require my students to read) and Sheila Tobias’ *They’re Not Dumb, They’re Different*.

My interdisciplinary research has always been reflected in my classroom teaching. In addition to teaching such courses as Advanced Laboratory in Mechanics and Heat, Medical Physics, Electricity and Magnetic Fields, General Physics, Bioelectricity, Elementary Physics, Biophysical Electrodynamics, Principles of Physics, Practical Physics, Introduction to Applied Physics, and Electricity, Magnetism, and Electrodynamics to undergraduates, I have developed new demonstrations for pre-med introductory courses, taught medical physics to biomedical engineers, and electricity and magnetism to senior physics undergraduates and incoming graduate students. I have enlisted undergraduates to develop course materials, the largest such project being an Advanced Undergraduate Laboratory in Living State Physics, supported by NSF and Vanderbilt. As my interdisciplinary research has expanded into new areas, so has my teaching. In 2003, I received a Whitaker Special Opportunity Award (“Instrumenting and Controlling the Single Cell: An Education Program in Biomedical Engineering”) that supported two new faculty members and created new courses.

I have participated in Vanderbilt’s College Scholars Honors Seminars Program since I first proposed it and its subsequent implementation more than thirty years ago, leading undergraduate seminars that explore such topics as Scientific Revolutions, Physics of Technology, and, most recently, What is Life?, and Why is Biology Complex?. The last two classes have enrolled a wonderful mix of science, humanities, and engineering students, who undertake critical and extensive readings guided by a Socratic dialogue and complemented with student-led presentations. My most recent honors seminar offering is leading to a critical

review authored with two undergraduates entitled “Potential for Parasitology Research Using Organs-on-Chips and Microphysiological Systems.”

From the beginning of my career I have enriched my research endeavors with a steady stream of some of Vanderbilt’s brightest, most energetic students and postdocs from physics, chemistry, biology, medicine, and electrical, mechanical, and biomedical engineering and continually taught them to communicate across disciplines. In establishing VIIBRE, I maintained a strong focus on undergraduate, graduate, and postdoctoral education, and through each of VIIBRE’s projects in innovative technologies I have supported and/or mentored multiple trainees from across the physical and biomedical sciences.

On the undergraduate level, the most visible evidence of this effort is the Systems Biology and Bioengineering Undergraduate Research Experience (SyBBURE), a major program funded by Vanderbilt alumnus Gideon Searle and introduced under the auspices of VIIBRE in 2006, with the goal to provide undergraduate students, as early as possible in their academic careers, with training in specific research tools and active participation in interdisciplinary scientific research. This multi-year, year-round program allows approximately forty-five undergraduate students to get deeply involved in long-term research projects and present their work at national conferences. Every year, one or more SyBBURE students can extend their experience into a paid, post-baccalaureate year of funded research. SyBBURE can boast – among other honors won by its participants – Goldwater Scholars, Beckman Scholars, and NSF Graduate Research Program Fellows, and placement in graduate and professional programs including those at the University of Chicago, MIT, Stanford, the University of Washington, Berkeley, Rice, Georgia Tech, Northwestern, Harvard, Columbia, Carnegie Mellon, and Vanderbilt. Many of the SyBBURE alumni maintain close contact with the program, as they complete pairs begun as undergraduates, assume a leadership and mentoring role in SyBBURE for their post-baccalaureate year, or return to speak to the group or for a research year midway through medical school. Two SyBBURE alumni later returned to Vanderbilt as faculty members in the School of Medicine. In 2016, Searle pledged \$5.25 million to continue the program for an additional ten years.

At the graduate level, I lead students to conceive of the Ph.D. in the terms of my own mentor at Stanford, William Fairbank, as a “state of mind” that is reached in four steps: 1) on your own you must identify a problem, 2) figure out how to solve it, 3) proceed to solve it, and 4) successfully write it up. Often students get trapped at one of the levels, and my primary role as an advisor is to help them to successfully navigate the transitions between stages and to achieve the state of mind commensurate with the degree. Fairbank never stated it, but I came to recognize that his fifth level was for the student to ask for the degree. Over the years, I have watched students progress through these levels with differing transition probabilities and rate constants. Ideally, their intellects and personalities continue to build on a strong foundation thereafter.

After successfully teaching large Physics lecture classes for two decades, I came to realize that there was a need to expose students at all levels to the rigors of cutting-edge research, and that presenting them with already solved problems was not the best way to do this. Based on the lessons learned from my College Scholars Honors Seminars, I now teach a four-semester rotation of seminars: Systems Biology, Physical Measurements of Biological Systems, Automation of Biology, and Why is Biology Complex? A broad mix of undergraduate and graduate students from Engineering, Arts and Science, Music, and Medicine, and even Medical School residents, enroll in the first three; the last is limited to honors undergraduates in Arts and Science and Engineering. These are intense, twice-weekly seminars that attempt to address questions such as “How do we use multi-omics to automate the generation of mechanisms of action of drugs and toxins?,” “How do you detect life in a sample of water, for example retrieved from Martian ice?,” “What is required to apply machine learning to the controlled differentiation of induced pluripotent stem cells?,” “How should one scale organs-on-chips?,” “Can a MultiWell MicroFormulator be used to impose circadian rhythms on a well plate or organ chip?,” “How might we control the differentiation of induced pluripotent stem cells into specific neuronal lineages for which cell growth and migration are critical?,” “Can organs-on-chips contribute to parasitology?,” “How does one apply Boolean networks to model cellular differentiation and dedifferentiation?,” and “How does one design, build, and use a 10,000 microchemostat?” These seminars

attract between two and eighteen students, whom I then guide as they teach each other and forge one or more projects and reports. Typically, by mid-semester the class exhibits an emergent behavior wherein individual skills, knowledge, and interests merge to create polished group presentations and one or more reports, which have led to published papers, issued patents, funded proposals, and successful methodologies. In the process, I acquire a breadth of knowledge that I could not achieve on my own – the students are my teachers.

University Service:

Ever since I arrived at Vanderbilt in 1977, I have served on a wide range of departmental, college, and university committees; this contribution was recognized in 1997, when I received the Thomas Jefferson Award for university service. Of all of my service and administrative activities, several have had a lasting University-wide impact. In 1984-1985, I served on the Ad Hoc Committee on a Special Program for Outstanding Students, which recommended the creation of the College Scholars Program. From 1990-1993, I took an active role, through the University Patent Review Committee, in the development of the University's intellectual property policy. From 1995 through 1998, I chaired the Committee on Appointment, Promotion, and Tenure, which conducted an in-depth review and revision of the criteria, policies, and procedures for appointment, promotion, and tenure within University Central. These last two committees have defined an appreciable fraction of the current *Faculty Manual* for Vanderbilt University. From 1999-2001, I served on the Provost's Strategic Academic Planning Group that developed a strategic plan for University Central and laid the foundation for Vanderbilt's Academic Venture Capital Fund, which represented a major investment in transinstitutional research programs. I then directed the Strategic Academic Plan for the College of Arts and Science (SAPCAS), serving as Chair of the Senior Steering Council in 2000-2001. Since then, I have been the director of the Vanderbilt Institute for Integrative Biosystems Research and Education (VIIBRE), which has leveraged a \$5.1 million investment by Vanderbilt into over \$90 million of external, interdisciplinary grants, including a large philanthropic donation from Gideon Searle, a Vanderbilt alumnus, to create and fund the Systems Biology and Bioengineering Undergraduate Research Experience (SyBBURE) Searle Undergraduate Research Program.

For the past two years, I have directed my administrative attention to the challenges of navigating my research group, VIIBRE, and the Vanderbilt MicroFabrication Core through a perilous transition by the University from a COBOL-based central accounting system to one that resides somewhere in the Oracle cloud, and a parallel transition into the Agilent iLab cores management system. My fifty years of experience in project and grants management and a growing respect for Excel pivot tables are proving useful as I develop my own tools for budget reconciliation and prediction to guide myself through the decade of the 2020s.

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA**

Justice 360,

Plaintiff,

v.

Bryan P. Stirling, Director of the South Carolina
Department of Corrections; and Alan Wilson, South
Carolina Attorney General,

Defendants.

Civil Action No. 3:20-03671-MGL

DECLARATION OF LINDSEY S. VANN

I, LINDSEY S. VANN, declare as follows:

1. I am over 18 and qualified to testify in a court of law. I am an attorney and the Executive Director of Justice 360 in Columbia, South Carolina. I have been an attorney at Justice 360 since September 2013. I received my bachelor's degree from Cornell University and my law degree from the University of Richmond School of Law. Prior to my employment at Justice 360, I served as a law clerk to the Honorable James R. Spencer in the United States District Court for the Eastern District of Virginia. A copy of my current CV is attached as Exhibit A.
2. Justice 360 is a non-profit legal organization dedicated to reforming practices and procedures in capital proceedings in South Carolina. The organization fulfills its mission through four types of work: (1) direct representation of individual clients facing the death penalty; (2) developing and providing resources, consulting, and training to other attorneys

representing clients facing the death penalty; (3) policy advocacy for systemic reforms in the administration of the death penalty; and, (4) public education, *i.e.*, providing the citizens of South Carolina with information about the administration of the death penalty in this state.

3. As an attorney at Justice 360, I personally represent ten individuals on South Carolina's death row;¹ I consult with attorneys for many of the other individuals on death row; I track all South Carolina death penalty cases; and I direct the organization's advocacy and public education programs. Three other attorneys are employed by Justice 360, and they represent five additional individuals sentenced to death in South Carolina. Overall, Justice 360 provides direct representation for nearly 40% of South Carolina's death row.
4. I am counsel for Richard Moore who was sentenced to death in Spartanburg County, South Carolina in 2001. I began representing Mr. Moore in 2014 when his case went into federal habeas proceedings and have represented him in all of his legal proceedings since that time.² His appellate proceedings are nearing their termination. Based on my tracking of South Carolina death penalty cases, if he is not granted relief in the courts or clemency by the Governor, I anticipate that, as early as late-November of this year, he could be the first person executed in South Carolina since 2011.³

¹ I am appointed as counsel for each of these individuals by a state or federal court, pursuant to S.C. Code § 17-27-160(B) and 18 U.S.C. § 3599, respectively.

² My appointment pursuant to 18 U.S.C. § 3599 provides that I "shall represent [Mr. Moore] throughout every subsequent stage of available judicial proceedings, including . . . all available post-conviction process, together with applications for stays of execution and other appropriate motions and procedures, and shall also represent the defendant in such competency proceedings and proceedings for executive or other clemency as may be available to the defendant." *Id.* § 3599(e).

³ Justice 360 attorneys also represent Brad Keith Sigmon whose case is also nearing the termination of appellate proceedings. If Mr. Moore is not the next person executed by South Carolina, it is likely Mr. Sigmon could be.

5. South Carolina Code § 24-3-530 provides that an inmate with an imminent execution date may select the method of execution: either lethal injection or electrocution. If an inmate was sentenced to death after 1995 and does not make a selection, the execution must be carried out by lethal injection. *Id.*
6. The Supreme Court of the United States has established that an inmate who believes a particular method of execution is likely to cause a substantial risk of severe pain in violation of the Eighth Amendment must propose a viable alternative method of execution. *Bucklew v. Precythe*, 139 S. Ct. 1112, 1126 (2019) (“[I]dentifying an available alternative [method of execution] is a requirement of *all* Eighth Amendment method-of-execution claims alleging cruel pain.”). For example, in some states, inmates have asked to be executed by firing squad or lethal gas as an alternative to methods of execution they assert are unconstitutional.
7. To properly counsel Mr. Moore and other Justice 360 clients in selecting the method of their own death, I requested information from the South Carolina Department of Corrections (“SCDC”) on how it plans to carry out each of the two execution methods currently authorized by South Carolina law. On March 19, 2015, Justice 360 wrote to SCDC requesting documentation of SCDC’s attempts to acquire lethal injection drugs for executions over the past five years as well as “the current SCDC execution directives and procedures.” Letter from Lindsey Vann to David Tatarsky & FOIA Coordinator (March 19, 2015). Between March 2015 and May 2016, I inquired with SCDC as to the status of my initial request multiple times, but because SCDC did not respond to my initial request, I submitted a second. Letter from Lindsey Vann to David Tatarsky & FOIA Coordinator (May 11, 2016). SCDC responded to this second request with documentation concerning

its acquisition of lethal injection drugs, and denied Justice 360's request for information regarding SCDC's then-current execution procedures by invoking FOIA Exemption 30-4-20(c). Email from Jonathan Eckstrom to Lindsey Vann (May 31, 2016); Letter from Lindsey Vann to David Tatarsky (May 11, 2016). SCDC reasoned that its execution procedures were "security plans and devices" within the definition of Exemption 30-4-20(c). Email from Jonathan Eckstrom to Lindsey Vann (May 31, 2016). On September 1, 2020, I again requested information in my capacity as counsel for Justice 360. *See* Letter from Lindsey Vann to Bryan Stirling, Director of SCDC, Sept. 1, 2020, attached as Exhibit B. Counsel for the SCDC responded that they "do not agree that [I am] entitled to the information [I] requested." Letter from Sally Elliott, Chief Legal and Compliance Officer at SCDC to Lindsey Vann, Sept. 29, 2020, attached as Exhibit C. The letter stated its reliance on a letter by the South Carolina Attorney General, 2015 WL 4699337, interpreting S.C. Code § 24-3-580 (hereinafter the "Secrecy Statute") as the basis for this position.

8. Justice 360 also requested this information through the South Carolina Freedom of Information Act ("FOIA"). On October 13, 2020, I submitted a FOIA request to the SCDC FOIA office, on behalf of Justice 360, requesting the same information requested in letter described above. SCDC responded on October 21, 2020 that all the information requested was exempt from disclosure under FOIA. The request and SCDC response are attached as Exhibits D and E, respectively.
9. Historically, Justice 360 and counsel for individuals facing an imminent execution have obtained execution protocols from SCDC in advance of an execution via a request to the SCDC. Most recently, our office was able to obtain the execution protocols in effect in

1999, 2002, and 2008. The protocols are attached as Exhibits F. The 2008 protocol was in effect during the last execution carried out in South Carolina in 2011.

10. Without information about how SCDC plans to carry out an execution via lethal injection or electrocution, I cannot fulfill my ethical and legal duties to advise Mr. Moore in making an informed decision as to how he wishes to be put to death.

11. Information about how each method of execution will be carried out is particularly important because each method, if not properly administered, could create a substantial risk of severe pain and result in a prolonged and agonizing death.

i. For example, after Oklahoma refused to “disclose the source of the [execution] drugs being used in a newly tried combination” to execute Clayton Lockett on April 29, 2014, Mr. Lockett’s execution dragged on for an excruciating 43 minutes after the drugs were administered while he continued “to writhe and gasp after he had already been declared unconscious and called out ‘oh, man’” and “tried to rise and exhaled loudly.” Erik Eckholm, *One Execution Botched, Oklahoma Delays the Next*, N.Y. Times (Apr. 29, 2014), <https://www.nytimes.com/2014/04/30/us/oklahoma-executions.html>.

Though the state attempted to halt the execution after 20 minutes, Mr. Lockett died of a heart attack while still in the execution chamber. *Id.*

ii. Probably the most well-known example of the dangers associated with improper administration of an electrocution is Jesse Joseph Tafero who was executed by the State of Florida on May 4, 1990. Death Penalty Information Center, <https://deathpenaltyinfo.org/executions/botched-executions> (last

visited November 1, 2020) (collecting contemporaneous newspaper reports of execution). During the electrocution, “six-inch flames erupted from Tafero’s head, and three jolts of power were required to stop his breathing.” *Id.* An investigation revealed the problems with this electrocution resulted from “the inappropriate substitution of a synthetic sponge for a natural sponge that had been used in previous executions.” *Id.*

12. As with any lawyer, my duty to Mr. Moore includes the responsibility to provide “straightforward advice expressing [my] honest assessment.” Rule 2.1, RPC, Rule 407, SCACR. However, in a capital post-conviction case, like this one, an attorney’s role as advisor to their client takes on unique importance.
13. In capital cases, the client literally trusts his life to his lawyer and her legal decisions and advice. In a capital post-conviction case, appointed counsel often represents a client for many years over the course of multiple levels of judicial review. Capital attorneys are also ethically required to develop a relationship of trust with the client (and his family) in order to provide adequate representation. ABA Guidelines for the Appointment and Performance of Defense Counsel in Death Penalty Cases, 10.5.A (2003) (“Counsel at all stages of the case should make every appropriate effort to establish a relationship of trust with the client, and should maintain close contact with the client.”); *see also id.* at 10.5 commentary (“Establishing a relationship of trust with the client is essential. . . . It is also essential to develop a relationship of trust with the client’s family or others on whom the client relies for support and advice.”). The relationship of trust is necessary to allow a capital attorney to learn the most intimate details of a client’s life that are “necessary to present an effective penalty phase defense, and to ensure that the client will listen to counsel’s advice on

important matters.” *Id.* at 10.5 commentary. This level of trust means that capital clients uniquely seek and rely on the advice of counsel when facing difficult legal decisions. If all their appeals are denied, capital clients generally rely on the trusted relationship built with their attorneys and seek advice on the selection of an execution method required by law.

14. I have represented Mr. Moore for nearly six years. We have developed the unique level of trust discussed above. Mr. Moore has trusted my legal judgment and advice throughout the course of four levels of judicial review (district court, Fourth Circuit Court of Appeals, Supreme Court of the United States, and a second post-conviction proceeding in a state trial court). During this time, we have thoroughly discussed the intimate details of Mr. Moore’s life. I have also met many of his family members. Most importantly, I have also developed a relationship with Mr. Moore’s children, the two most important people in Mr. Moore’s life. Through these interactions, Mr. Moore and I have developed a close, trusting relationship. As our relationship developed, I became the person Mr. Moore speaks to the most often and depends on for advice in various areas of his life.⁴

15. Knowing the choice potentially looming in Mr. Moore’s future, I have had initial conversations with Mr. Moore about the fact that South Carolina law allows him the choice between lethal injection and electrocution. During these discussions, Mr. Moore asked many questions that I could not answer because I do not know how SCDC plans to carry out either method. Mr. Moore asked for my legal and personal advice regarding which method he should select, but without the information I requested from SCDC in my September 1, 2020 letter, I cannot advise him on his choice. Nor can he consult with his family, friends, or religious advisors about his choices with so little information. The

⁴ Mr. Moore’s children have traveled overseas for significant periods of time, with his daughter living permanently on military bases in Japan and Spain, hindering their ability to communicate regularly.

unknowns and inability to receive advice on this important and unparalleled decision is a source of stress for Mr. Moore (and myself as well).

16. Justice 360 also represents other death-sentenced individuals whose cases are in federal habeas corpus proceedings, the final stage of the capital appellate process. Many of these individuals are cognitively impaired or have mental health problems, many of which are exacerbated during times of stress. This further complicates an attorney's ability to have meaningful discussions with them about the method of execution selection process and heightens the individual's dependence on his attorney's advice and counsel to make legal decisions, including the selection of a method of execution.

17. Many of the individuals represented by Justice 360 also have medical conditions and drug use histories that may be consequential depending on the procedure for carrying out a method of execution, particularly lethal injection. I have consulted with a physician who informed me that she would need more information about the drugs to be used in an execution to know if an inmate's medical history might put them at a particular risk of a prolonged and painful execution through lethal injection. This would obviously be relevant to the selection of a method of execution.

18. SCDC's refusal to provide information on the plan for carrying out the statutorily available execution methods also hinders my ability to evaluate the viability of a potential challenge to execution methods under the Eighth Amendment bar against cruel and unusual punishment.

- i. To provide effective and ethical legal representation to a client facing execution, I must determine whether his constitutional rights are being or will be infringed and, if so, file suit to protect those rights. In a similar vein,

as an officer of the court, I must avoid filing frivolous lawsuits if there is no constitutional violation. *See* Fed. R. Civ. P. 11; Rule 11(a), SCRCP. In order to accomplish both of those goals, I need information about (1) the legal standard for determining if there is a viable constitutional claim, and (2) the facts relevant to the legal standard.

- ii. Under the current legal standards, to determine if a state execution method violates the Eighth Amendment, an individual facing execution must determine if, and provide the courts with evidence that, there is a “feasible and readily implemented alternative method of execution that would significantly reduce a substantial risk of severe pain.” *Bucklew*, 139 S. Ct. at 1125.
- iii. In circumstances like this, where the question is what methods of execution would “significantly reduce a substantial risk of severe pain,” I would consult experts familiar with the various methods and their effects on the human body (such as experts in pharmacology, anesthesiology, electricity, etc.). Consultation with experts is necessary because my legal training does not provide me with sufficient medical, physiological, and electrical expertise to evaluate execution methods on my own. This is similar to other parts of a capital case when I consult with forensic, mental health, and other experts who provide opinions relevant issues in an individual’s case.
- iv. I have attempted to consult with the necessary experts to determine if Richard Moore is at risk of suffering an unconstitutional execution and whether there is a viable alternative to the statutorily authorized methods,

but all of the experts informed me that they need further information about how the methods of execution would be carried out in order to determine if these methods pose “a substantial risk of severe pain.” Therefore, neither I nor the experts I have consulted with have sufficient information to determine the validity of a challenge to execution methods under the Eighth Amendment. Indeed, in conducting the inherently comparative Eighth Amendment analysis, it is impossible to evaluate an alternative method of execution without knowing what the alternative would be replacing.

19. I also cannot fulfill Justice 360’s mission of providing the public with information about the administration of the death penalty in South Carolina. One of the most frequently asked questions from the public is about the methods of execution used in South Carolina.
20. On November 6, 2020, the South Carolina Supreme Court issued an execution notice, setting my client Richard Moore’s execution date for December 4, 2020. On the same day, SCDC officials served notice of the warrant on Moore and asked him to elect a method of execution pursuant to Section 24-3-530(A), South Carolina Code. Having no information about SCDC’s plan for effectuating his death, either by electrocution or lethal injection, Moore informed the SCDC officials that he could not select a method of execution. The officials responded that they would return on November 20, 2020—the last day on which a selection was statutorily authorized—to ask for Moore’s election of a mode of execution.
21. In an effort to make an informed decision, Moore submitted requests for the lethal injection and electrocution protocols, through the SCDC staff request system and using SCDC forms, to BRCI Warden Michael Stephen, Associate Warden Eric Ramos and Regional

Director Willie Davis on November 10, 2020. Request to Staff Member Forms, attached as Exhibit G. Moore's requests have, to date, gone unanswered.

22. On November 16, Moore's counsel filed petitions in the original jurisdiction of the Supreme Court of South Carolina seeking a writ of mandamus, a writ of common law certiorari, and declaratory judgment, asking the court to decide in its original jurisdiction that Moore has a statutory and due process right to the information Moore and I had been requesting since September.
23. On November 18, two days before Moore's opportunity to select a method of execution would expire, counsel for the state-court Defendants/Respondents filed a return to the petitions and an answer to Moore's complaint. Despite refusing, for months, to give Moore any information he has requested, SCDC made the following representation in its return: "SCDC has decided that it will allow members of Petitioner's legal defense team access to the protocols for both electrocution and lethal injection before Petitioner makes his election on, or before, November 20, 2020." An affidavit from Colie Ruston, the Director of Security for SCDC, was attached to the return.
24. In response to this offer, Moore's counsel filed a Reply to SCDC's Return indicating that the offer to review the protocols was insufficient because the protocols could not be final if, as SCDC was representing to the media, they did not possess lethal injection drugs to carry out a lethal injection execution. Nevertheless, in an attempt to to be even partially informed, Hannah Freedman and I (as counsel for Moore) contacted opposing counsel to schedule a time to view the protocols.

25. Although SCDC's Return did not include any parameters for "confidential review," opposing counsel informed Moore's attorneys on November 18 that they would be asked to comply with the following list of "logistics for review":

1. At SCDC headquarters
2. We can be flexible on the time
3. Members of Mr. Moore's defense team
4. Protocols will be available in a conference room for your review
5. No copies will be given
6. No photos or other verbatim copying of the protocols would be allowed
7. Notes can be taken but any notes must be held confidential and only used to advise Mr. Moore as he chooses his election pursuant to SC Code 24-3-530.

Ms. Freedman and I made arrangements with opposing counsel to meet at SCDC headquarters at 1:00 p.m. on November 19, 2020 to review the protocols, subject to the above noted restrictions.

26. At 9:13 on November 19, counsel for SCDC informed Moore's attorneys that they needed to arrive 15-20 minutes earlier, between 12:40 and 12:45. Then, at 12:19 p.m., less than thirty minutes before Moore's counsel had been instructed to arrive at SCDC headquarters, SCDC's general counsel sent Moore's counsel a "confidentiality agreement." Emails between Lindsey S. Vann and Daniel Plyler, attached as Exhibit H. The "agreement" was a copy of a contract that Moore's attorneys would be required to sign before viewing the protocols. The "agreement" included the following paragraph:

Receiving Parties agree that any breach of this Agreement by any Receiving Party will cause irreparable harm to SCDC, its employees, and any potential member of the execution team for the execution of Richard Bernard Moore, that cannot be adequately compensated with money damages. Accordingly, SCDC shall be entitled to injunctive relief to enforce this Agreement, in addition to damages and other available remedies, to include, but not be limited to, reasonable attorneys' fees. In the event SCDC is required to enforce the terms of this Agreement in order to remedy or prevent any breach of this Agreement, the Receiving Party shall, in addition

to any other damages for which it is responsible hereunder, pay and reimburse to SCDC the reasonable attorneys' fees and costs of SCDC associated with such enforcement.

Confidentiality Agreement, attached as Exhibit I. After reviewing this provision and determining other sections of the agreement could be considered waiving the open questions before the South Carolina Supreme Court, Ms. Freedman and I indicated to opposing counsel that we would no longer be attending the meeting scheduled for 1:00.

27. On November 20, 2020, Ms. Freedman I met with Moore around 10:15 a.m. and advised him that we did not have adequate information to counsel him on which mode of punishment to choose. A few minutes after our arrival to counsel Mr. Moore, three SCDC officials and a notary arrived and presented him with Notice of Election forms for lethal injection and electrocution. Because he still did not have information about how SCDC planned to carry out either execution method. Moore refused to make a selection and wrote "I can not make a selection at this time to method because my attorney and I do not have information for the protocols. By not selecting does not mean I waive my right to select." Notice of Election Forms, Nov. 20, 2020, attached as Exhibit J.

28. Also on November 20, 2020, the South Carolina Supreme Court refused to entertain the merits of Moore's legal arguments raised in the November 16, 2020 pleadings, stating only: "Plaintiff asks this Court, in our original jurisdiction, for a declaratory judgment, a writ of certiorari, or a writ of mandamus. The requests are denied." Order (Nov. 20, 2020), attached as Exhibit K.

29. Later, at 4:54 p.m. on November 20, 2020, counsel for Bryan Stirling and SCDC sent me a letter, stating that: "SCDC has authorized me to provide you with the following information: SCDC's current lethal injection protocol is a three drug protocol, which begins with an injection of Pentobarbital, followed at an appropriate time interval by

Pavulon (Pancuronium Bromide), and the followed at an appropriate time interval by Potassium Chloride.” The letter went on to say that “SCDC reserves the right to amend its lethal injection proposal, and it is unable to secure sufficient quantities of each of the three drugs listed above, it is prepared to enact a one-drug protocol, which would consist of the use of Pentobarbital Sodium.” Letter from Daniel C. Plyler to Lindsey Vann, Nov 20, 2020, attached as Exhibit L.

30. The November 20, 2020 letter from SCDC’s counsel does not indicate where or how SCDC is attempting to obtain the lethal injection drugs described in the letter. However, at legislative hearings before the Senate Corrections and Penology Committee, Bryan Stirling, in his capacity as Director of SCDC, has indicated that the department would likely have to obtain lethal injection drugs from a compounding pharmacy.

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



LINDSEY S. VANN

11/24/2020

EXHIBIT A

LINDSEY S. VANN

Executive Director, Justice 360
900 Elmwood Ave., Suite 200
Columbia, SC 29201
(803) 765-1044
lindsey@justice360sc.org

WORK EXPERIENCE

Justice 360 (formerly Death Penalty Resource & Defense Center), Columbia, South Carolina
Executive Director, September 2017-Present
Staff Attorney, September 2015-September 2017
Fellowship Attorney, September 2013-September 2015

United States District Court for the Eastern District of Virginia, Richmond, Virginia
Law Clerk to the Honorable James Spencer, August 2012-August 2013

EDUCATION

University of Richmond School of Law, Richmond, Virginia
Juris Doctor, summa cum laude, May 2012

Cornell University, Ithaca, New York
Bachelor of Science, Hospitality Management, May 2005

PUBLICATIONS

Death by Numbers: Why Evolving Standards Compel Extending Roper’s Categorical Ban Against Executing Juveniles from 18 to 21, 98 TEX. L. REV. 921 (2020) (with John H. Blume, Hannah L. Freedman, and Amelia Courtney Hritz).

Protecting People with Intellectual Disability from Wrongful Execution: Guidelines for Competent Representation, 46 HOFSTRA L. REV. 1107 (2018) (with Sheri Lynn Johnson, John H. Blume, and Emily Paavola).

Forty Years of Death: The Past, Present, and Future of the Death Penalty in South Carolina (or Still Arbitrary After All These Years), 11 DUKE J. CONST. L. & PUB. POL’Y 183 (2016) (with John H. Blume).

History Repeats Itself: The Post-Furman Return to Arbitrariness in Capital Punishment, 45 U. RICH. L. REV. 1255 (2011).

PRESENTATIONS

Introduction to Atkins Litigation
March 2020, National Seminar on the Development and Integration of Mitigation Evidence,

Philadelphia, PA

Tools of the Mitigation Trade

March 2019, National Seminar on the Development and Integration of Mitigation Evidence, Philadelphia, PA

Investigating Adaptive Functioning

March 2019, National Seminar on the Development and Integration of Mitigation Evidence, Philadelphia, PA

Managing Mitigation Data

March 2019, National Seminar on the Development and Integration of Mitigation Evidence, Philadelphia, PA

Expanding Roper & Miller: Legal Arguments for 18-20 Year Old Offenders

February 2019, Oklahoma Miller & Capital Defense Training, Tulsa, OK

Legal Duties in Representing Juveniles Facing LWOP & Considerations for Other Young Offenders

September 2018, South Carolina Public Defender Conference, Myrtle Beach, SC

Adaptive Deficits in Culturally Complex Cases

August 2018, National Federal Habeas Corpus Seminar, Baltimore, MD

New Ideas for that Same Old Drama – Litigating Race in Your Case

August 2018, National Federal Habeas Corpus Seminar, Baltimore, MD

Extending Roper

August 2018, National Federal Habeas Corpus Seminar, Baltimore, MD

Expanding Miller: Legal Arguments for 18-20 Year Old Offenders

April 2018, OSPD & MPDA Spring Public Defender Seminar, Biloxi, MS

Managing Mitigation Data: How to Utilize Cost-Effective Technology to Manage Information in Social History Investigation

April 2018, National Seminar on the Development and Integration of Mitigation Evidence, Miami FL

Litigating Race in Your Capital Case

January 2018, Georgia Capital Defender Training, Savannah, GA

Atkins: Current Litigation Trends

August, 2017, National Federal Habeas Corpus Seminar, Atlanta, GA;

April, 2017, National Seminar on the Development and Integration of Mitigation Evidence, Baltimore, MD;

August, 2016, National Federal Habeas Corpus Seminar, Washington, D.C.

Investigating Deficits in Adaptive Behavior

August, 2017, National Federal Habeas Corpus Seminar, Atlanta, GA;
April, 2017, National Seminar on the Development and Integration of Mitigation Evidence, Baltimore, MD

Batson and other Race Litigation

August, 2016, National Federal Habeas Corpus Seminar, Washington, D.C.

Death Penalty Mitigation Investigation

March, 2016, South Carolina Public Defender Investigator Association Conference, Myrtle Beach, South Carolina

Forty Years of Death Symposium Presentation

February, 2016, Duke Journal of Constitutional Law & Public Policy, Durham, North Carolina

South Carolina and the Death Penalty

December, 2017, South Carolina Women Lawyers Association, Spartanburg, South Carolina
October, 2015, South Carolina Women Lawyers Association, Myrtle Beach, South Carolina

Lethal Injection and Secrecy Efforts Panel

2015 Bending the Arc: Sharpening Our Focus and Building Capacity, New Orleans, Louisiana

Atkins Update

2015 National Federal Habeas Corpus Seminar, Charlotte, North Carolina

Atkins Overview: Litigation Lessons

2014 National Seminar on the Development and Integration of Mitigation Evidence, Philadelphia, Pennsylvania

TRAINING

2013–2015, 2017, 2019 & 2020 *National Seminar on the Development and Integration of Mitigation Evidence*, Habeas Assistance and Training Counsel

2013–2020 *National Federal Habeas Corpus Seminar*, Habeas Assistance and Training Counsel

2018 *Georgia Capital Defender Training*, Georgia Capital Defender

2015 *Anthony G. Amsterdam Supreme Court Advocacy Institute*, Habeas Assistance and Training Counsel

2015 *Annual Capital Punishment Training Conference*, NAACP Legal Defense & Educational Fund

2015 *Bending the Arc: Sharpening Our Focus and Building Capacity*, Tides & 8th Amendment

Project

2014 *Habeas Institute: Federal Post-Conviction Skills Seminar*, Habeas Assistance and Training Counsel

2014 *Capital Mitigation Skills Workshop*, Habeas Assistance and Training Counsel

2014 *The Persuasion Institute: A Workshop in Legal Storytelling and Narrative Construction for Capital Post-Conviction Counsel*, Habeas Assistance and Training Counsel

EXHIBIT B

September 1, 2020

Bryan P. Stirling
Director, South Carolina Department of Corrections
PO Box 21787
Columbia, SC 29210

Re: South Carolina Department ("SCDC") of Corrections Execution Protocols

Dear Bryan:

We represent three death row inmates whose cases are nearing the end of their judicial appellate review proceedings: Richard Moore, Brad Sigmon, and Khalil-Divine Black Sun-Allah (FKA Freddie Owens). Each of these individuals has been denied relief in the Fourth Circuit Court of Appeals and will be seeking review by the Supreme Court of the United States in the coming weeks and months. Given the low number of cases that receive Supreme Court review, it is likely one or more of our clients will have execution dates set in the late fall or winter.

In anticipation of these likely execution dates, we write to ask you to provide us with the following information, which is necessary for us to adequately advise our clients regarding their choice of execution method pursuant to S.C. Code § 24-3-530 and to fulfill our duties to provide them with adequate legal representation.

- The SCDC **lethal injection directive or protocol** (current and/or as proposed to be in place at the time of the upcoming executions) and related information, including, but not limited to:
 - The type(s) of lethal injection drug(s) to be used;
 - The supplier(s) and/or compounder(s) of the lethal injection drugs (and any supplier(s) of components to be used in compounding) and the date or dates on which the drugs were manufactured;
 - Information about quality control measures used to ensure the purity and efficacy of the lethal injection drugs, including the results of any tests or analyses performed on the drugs;
 - Information about storage and handling of the lethal injection drugs, including, but not limited to: all current and past storage locations; temperature controls in the storage locations and any vehicles used for transport; light control measures in the storage locations and any vehicles used for transport; the chain of custody for the drugs; and the job titles and qualifications of all personnel with access to the storage location;

- The expiration dates of lethal injection drugs to be used in the executions, including, if relevant, the expiration dates of any stabilizing compounds and the expiration dates of the active execution drug or drugs;
 - The mechanism or formula to be used for determining dosages and rates of drug administration for individual condemned men;
 - Whether and how SCDC medical or other staff will conduct physical examinations of the condemned men prior to execution to identify any possible issues in administering the lethal injection drugs (*i.e.*, IV placement concerns) and/or medical issues that could affect the efficacy and or pain caused by the lethal injection drug(s); and
 - Whether and how SCDC medical or execution staff will monitor the condemned men during the lethal injection process to ensure the lethal injection drugs work as intended, including whether observers will be provided a line of sight to the condemned men, and what, if any, remedial steps SCDC will implement if the execution process appears to be compromised or ineffective.
 - Whether and what measure will be taken to ensure that inmate's counsel or other representative present at an execution will be able to communicate with outside authorities, including court personnel, in the event the lethal injection process does not appear to be working as intended, to seek the intervention of these authorities.
- The SCDC **electrocution directive or protocol** (current and/or as proposed to be in place at the time of the upcoming executions) and related information, including, but not limited to:
 - Information regarding the current operability of the electric chair, including the dates and nature of any repairs, modifications, or upgrades to the chair since its last use; the location and condition of the storage facility where the chair has been housed since its last use; and the dates and nature of any examinations or inspections of the chair since its last use;
 - Information regarding the current intended to be administered, the voltage intended to be administered, and how such voltage will be administered and for what length(s) of time to the condemned men, and the safety measures taken to ensure the electrocution will not result in a substantial risk of severe pain to the condemned men;
 - Information regarding any testing or proposed testing of the electric chair since its last use, including: the nature of the tests (e.g. use of live mammals, any electronic or electrical testing equipment, etc.); the results of any testing including raw data; and details and results of any additional testing contemplated before use;
 - Whether and how SCDC medical or other staff will conduct physical examinations of the condemned men prior to execution to identify any possible issues in administering the electric chair and/or medical issues that could impact the efficacy of the electric chair;
 - Whether and how SCDC medical or execution staff will monitor the condemned men during the electrocution process to ensure the electric chair works as intended, whether and what the “back off” plan is should the process not work as intended; and what, if any, remedial steps SCDC will implement if the execution process appears to be compromised or ineffective.

- Whether and what measure will be taken to ensure that inmate’s counsel or other representative present at an execution will be able to communicate with outside authorities, including court personnel, in the event the lethal injection process does not appear to be working as intended, to seek the intervention of these authorities.
- Information of the following as it relates to both lethal injection and electrocution execution protocols:
 - Job titles and numbers of personnel to make up the execution team, including the titles and number of any SCDC staff, the titles and number of any federal, state, and local law enforcement officers, and the titles and number of any individuals hired on a contractual basis;
 - The professional qualifications of the execution team;
 - All documents describing the functions that will be performed by SCDC staff and any contractors who will participate in the executions;
 - The level of training received by each member of the execution team;
 - Details of any training received and/or proposed for members of the execution team; and
 - The price paid for any lethal injection drugs or materials used in lethal injection or electrocution, or, if any materials are donated, the fact of their donation.
- The following information as it relates to COVID-19 and executions by lethal injection or electrocution in the custody or control of SCDC:
 - Any modifications to the protocols and/or witness access planned due to the COVID-19 pandemic;
 - All records that relate to COVID-19 testing statistics at Broad River Correctional Facility, including the number of tests administered to prisoners and staff; the statistical results of those tests; the dates the tests were administered; the number of staff who tested positive who are included in the execution team; and
 - All documents or materials pertaining to any contact tracing and other steps taken by SCDC to identify staff and prisoners who may have been exposed to individuals infected with COVID-19 before any planned executions.

Thank you in advance for your assistance in this matter.

Sincerely,



Lindsey S. Vann
Hannah L. Freedman
Justice 360

Joshua Snow Kendrick
Kendrick & Leonard, PC

Rob Lee
Attorney-at-Law

Counsel for Richard Moore

Counsel for Brad Sigmon

Counsel for Freddie Owens

EXHIBIT C



SOUTH CAROLINA
DEPARTMENT OF CORRECTIONS
Safety, Service, and Stewardship

HENRY McMASTER, Governor
BRYAN P. STIRLING, Director

September 29, 2020

Justice 360
Ms. Lindsey S. Vann and Ms. Hannah L. Freedman
900 Elmwood Ave., Suite 200
Columbia, SC 29201

Kendrick & Leonard, PC
Mr. Joshua Snow Kendrick
1522 Lady St., Suite A
Columbia, SC 29201

Mr. Rob Lee
Attorney-at-Law
111 Witcover Street
Marion, SC 29571

Re: South Carolina Department (SCDC) of Corrections Execution Protocols

Dear Ms. Vann, Ms. Freedman, Mr. Kendrick and Mr. Lee:

Director Stirling asked that I review and respond to your correspondence of September 1, 2020. We appreciate you informing SCDC that Richard Moore, Brad Sigmon, and Freddie Owens are nearing the end of their judicial appellate review proceedings. The Attorney General's Office has given a similar timeframe for possible notices.

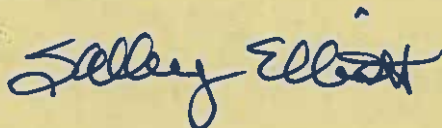
You have asked for the protocols for lethal injection and electrocution. First, as you are probably aware, we have publicly indicated that we do not have any of the drugs in our possession to perform an execution by lethal injection. Information about suppliers/and or compounders of the lethal injection drugs and information about security and medical personnel is not to be released given SCAG Opinion, 2015 WL 4699337. S.C. Code Section 24-3-580 prohibits the disclosure of the execution team member's identity or identifying information. The Attorney General opinion clarifies the meaning of "member of an execution team" broadly construing those terms and protecting the identities of individuals and companies involved in the process of an execution via lethal injection. We do not agree that you are entitled to the information you have requested. If you have authority for your request, please provide it to me.

Ms. Vann et al.
September 29, 2020
Page 2

The SCDC protocols to carry out an execution, whether by lethal injection or electrocution, have been developed and implemented over the years with the safety and security of all involved in mind. We continue to look at our processes in light of COVID-19. As you would agree, preventive measures to contain this disease have been quickly evolving. SCDC does have an extensive COVID-19 protocol that is on our website. We are also working on updating any preventive measures to be used during an execution during COVID-19.

Please forward any future correspondence related to execution protocols to me. If you have any questions, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read "Salley Elliott". The signature is written in a cursive style with a small mark above the second 'l' in Elliott.

Salley W. Elliott
Chief Legal and Compliance Officer

cc: Mr. Bryan P. Stirling, Director of the South Carolina Department of Corrections
Honorable Alan Wilson, South Carolina Attorney General

EXHIBIT D

October 13, 2020

FOIA Coordinator
South Carolina Department of Corrections
Post Office Box 21787
Columbia, SC 29221
FOIA@doc.sc.gov
Via email

RE: FREEDOM OF INFORMATION ACT REQUEST

To Whom It May Concern:

I am writing, pursuant to the Freedom of Information Act, S.C. Code § 30-4-10 through 110, to request information related to electrocution of inmates sentenced to death since 1977.

Justice 360 is an organization dedicated to fairness, reliability and transparency in the criminal justice system, especially as related to individuals facing the death penalty and juveniles facing lengthy sentences in South Carolina. In carrying out our mission, Justice 360 attorneys represent individuals sentenced to death in South Carolina, including several individuals nearing the termination of their appellate proceedings. We must accordingly be prepared to advise our clients on their execution method selection pursuant to S.C. Code § 24-3-530. In light of Justice 360's mission and our obligation to our clients, Justice 360 requests the information described below:

DOCUMENT REQUESTS

We seek disclosure of the following records under the South Carolina Freedom of Information Act, §30-4-10 *et seq.*:

- The SCDC **lethal injection directive or protocol** (current and/or as proposed to be in place at the time of the upcoming executions) and related information, including, but not limited to:
 - The type(s) of lethal injection drug(s) to be used;
 - The supplier(s) and/or compounder(s) of the lethal injection drugs (and any supplier(s) of components to be used in compounding) and the date or dates on which the drugs were manufactured;
 - Information about quality control measures used to ensure the purity and efficacy of the lethal injection drugs, including the results of any tests or analyses performed on the drugs;

- Information about storage and handling of the lethal injection drugs, including, but not limited to: all current and past storage locations; temperature controls in the storage locations and any vehicles used for transport; light control measures in the storage locations and any vehicles used for transport; the chain of custody for the drugs; and the job titles and qualifications of all personnel with access to the storage location;
 - The expiration dates of lethal injection drugs to be used in the executions, including, if relevant, the expiration dates of any stabilizing compounds and the expiration dates of the active execution drug or drugs;
 - The mechanism or formula to be used for determining dosages and rates of drug administration for individual condemned men;
 - Whether and how SCDC medical or other staff will conduct physical examinations of the condemned men prior to execution to identify any possible issues in administering the lethal injection drugs (*i.e.*, IV placement concerns) and/or medical issues that could affect the efficacy and or pain caused by the lethal injection drug(s); and
 - Whether and how SCDC medical or execution staff will monitor the condemned men during the lethal injection process to ensure the lethal injection drugs work as intended, including whether observers will be provided a line of sight to the condemned men, and what, if any, remedial steps SCDC will implement if the execution process appears to be compromised or ineffective.
 - Whether and what measure will be taken to ensure that inmate's counsel or other representative present at an execution will be able to communicate with outside authorities, including court personnel, in the event the lethal injection process does not appear to be working as intended, to seek the intervention of these authorities.
- The SCDC **electrocution directive or protocol** (current and/or as proposed to be in place at the time of the upcoming executions) and related information, including, but not limited to:
 - Information regarding the current operability of the electric chair, including the dates and nature of any repairs, modifications, or upgrades to the chair since its last use; the location and condition of the storage facility where the chair has been housed since its last use; and the dates and nature of any examinations or inspections of the chair since its last use;
 - Information regarding the current intended to be administered, the voltage intended to be administered, and how such voltage will be administered and for what length(s) of time to the condemned men, and the safety measures taken to ensure the electrocution will not result in a substantial risk of severe pain to the condemned men;
 - Information regarding any testing or proposed testing of the electric chair since its last use, including: the nature of the tests (e.g. use of live mammals, any electronic or electrical testing equipment, etc.); the results of any testing including raw data; and details and results of any additional testing contemplated before use;
 - Whether and how SCDC medical or other staff will conduct physical examinations of the condemned men prior to execution to identify any possible issues in administering the electric chair and/or medical issues that could impact the efficacy of the electric chair;

- Whether and how SCDC medical or execution staff will monitor the condemned men during the electrocution process to ensure the electric chair works as intended, whether and what the “back off” plan is should the process not work as intended; and what, if any, remedial steps SCDC will implement if the execution process appears to be compromised or ineffective.
- Whether and what measure will be taken to ensure that inmate’s counsel or other representative present at an execution will be able to communicate with outside authorities, including court personnel, in the event the lethal injection process does not appear to be working as intended, to seek the intervention of these authorities.
- Information of the following as it relates to both lethal injection and electrocution execution protocols:
 - Job titles and numbers of personnel to make up the execution team, including the titles and number of any SCDC staff, the titles and number of any federal, state, and local law enforcement officers, and the titles and number of any individuals hired on a contractual basis;
 - The professional qualifications of the execution team;
 - All documents describing the functions that will be performed by SCDC staff and any contractors who will participate in the executions;
 - The level of training received by each member of the execution team;
 - Details of any training received and/or proposed for members of the execution team; and
 - The price paid for any lethal injection drugs or materials used in lethal injection or electrocution, or, if any materials are donated, the fact of their donation.
- The following information as it relates to COVID-19 and executions by lethal injection or electrocution in the custody or control of SCDC:
 - Any modifications to the protocols and/or witness access planned due to the COVID-19 pandemic;
 - All records that relate to COVID-19 testing statistics at Broad River Correctional Facility, including the number of tests administered to prisoners and staff; the statistical results of those tests; the dates the tests were administered; the number of staff who tested positive who are included in the execution team; and
 - All documents or materials pertaining to any contact tracing and other steps taken by SCDC to identify staff and prisoners who may have been exposed to individuals infected with COVID-19 before any planned executions.

The public interest requires confidence in the judicial and criminal justice system that operates in the public’s name and on its behalf and is grounded in “the fundamental principle of public access to Government documents.” *John Doe Agency v. John Doe Corp.*, 493 U.S. 146, 151 (1989). The statute provides a mechanism for citizens to obtain “official information long shielded unnecessarily from public view and attempts to create a judicially enforceable public right to secure such information from possibly unwilling official hands.” *EPA v. Mink*, 410 U.S. 73, 80 (1973). The public interest

includes the oversight of government functions and is served by fulfilling this request. *National Ass'n of Atomic Veterans v. Director, Defense Nuclear Agency*, 583 F. Supp. 1483 (D.C. 1984).

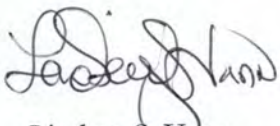
“South Carolina’s FOIA was designed to guarantee the public reasonable access to certain activities of the government.” *Fowler v. Beasley*, 322 S.C. 463, 468, 472 S.E.2d 630, 633 (1996); *see also South Carolina Tax Comm’n v. Gaston Copper Recycling Corp.*, 316 S.C. 163, 169, 447 S.E.2d 843, 846 (1994) (“The purpose of the FOIA is to protect the public from secret government activity.”). “[C]onsistent with FOIA’s goal of broad disclosure, the exemptions from its mandates are to be narrowly construed.” *Burton v. York County Sheriff’s Dep’t*, 358 S.C. 339, 348, 594 S.E.2d 888, 893 (Ct. App. 2004).

The South Carolina Freedom of Information Act requires a response time within twenty business days for information that is more than twenty-four months old. S.C. Code § 30-4-30(C). In addition, the information must be produced within thirty-five calendar days from the date on which the final determination is made. *Id.* If access to the records I am requesting will take longer than this amount of time, please contact me with information about when I might expect copies or the ability to inspect the requested records.

If you deny any or all of this request, please cite each specific exemption you believe justifies the refusal to release the information and notify us of the appeal procedures available under the law. The FOIA explicitly provides that public bodies are subject to both declaratory and injunctive relief, and, if this request goes to litigation and we prevail, we may recover both attorneys’ fees and costs. *Id.* § 30-4-110. If a court finds that the agency has “arbitrarily and capriciously” violated the FOIA “by refusal or delay in disclosing or providing copies of a public record,” it may order actual and compensatory damages, in addition to a civil fine. *Id.*

Thank you for your attention to this request. Please do not hesitate to contact me if you need further information.

Sincerely,



Lindsey S. Vann
Executive Director, Justice 360
lindsey@justice360sc.org

EXHIBIT E



Lindsey Vann <lindsey@deathpenaltyresource.org>

FOIA-0286-20 Justice 360

FOIA <FOIA@doc.sc.gov>
To: "Lindsey S. Vann" <lindsey@justice360sc.org>

Wed, Oct 21, 2020 at 10:18 AM

Attorney Vann,

The South Carolina Freedom of Information Act enumerates several matters which are exempt from disclosure pursuant to the Act or are excluded from the Act's definition of a public record. Most of the records which you have requested in FOIA-0286-20 are subject to one of these exemptions or exclusions. Specifically, the records you have requested are exempt or excluded based on the below listed sections of the FOIA statute. The available responsive records for information about COVID-19 protocols can be found on our public website <http://www.doc.sc.gov/>. SCDC considers FOIA-0286-20 to be closed. If you choose to modify and resubmit your request, it will be treated as a new request and assigned a new request number.

Applicable exemptions and exclusions:

S.C. Code § 30-4-20(c) Security plans and devices are specifically excluded from the definition of the term "public record."

S.C. Code § 30-4-40(a)(2) A public body may exempt from disclosure information if release of that information would constitute an unreasonable invasion of personal privacy.

S.C. Code § 30-4-40(a)(4) A public body may exempt from disclosure matters specifically exempted from disclosure by statute or law (S.C. Code § 24-3-580).

Sincerely,

SCDC FOIA Office

Post Office Box 21787

Columbia, SC 29221-1787

FOIA@doc.sc.gov

From: Lindsey S. Vann <lindsey@justice360sc.org>
Sent: Tuesday, October 13, 2020 3:53 PM
To: FOIA <FOIA@doc.sc.gov>
Subject: Justice 360 FOIA Request

11/10/2020

Justice 360 Mail - FOIA-0286-20 Justice 360

***** This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source. *****

Please see the attached FOIA request.

Thank you for your attention to this matter. Please do not hesitate to contact me if you need anything else.

Best,

Lindsey S. Vann

Executive Director, Justice 360

900 Elmwood Avenue, Suite 200

Columbia, SC 29201 | (803) 765-1044

 **2020.10.13 SCDC Protocol FOIA Request.pdf**
2944K

EXHIBIT F



**SOUTH CAROLINA
DEPARTMENT OF CORRECTIONS**

POLICY NUMBER: SK-22.03
TITLE: EXECUTION DIRECTIVES
ISSUE DATE: January 5, 1999
SUPERSEDES: SK-22.03 (September 16, 1998)
SK-22.03 (November 1, 1997)
**SUPPORTING
OPERATIONAL MANUAL:** OPERATIONS

AUTHORITY: DEPUTY DIRECTOR FOR OPERATIONS
ACA/CAC STANDARDS: NONE
STATE/FEDERAL STATUTES: Sections 24-3-510; 24-3-520; 24-3-530; 24-3-540;
24-3-550; 24-3-560; and 24-3-570, S. C. Code of Laws, 1976

PURPOSE: To provide general guidelines for the development of procedures to be followed prior to, during, and subsequent to an execution from which more detailed and specific procedures can be developed.

POLICY: As required by Section 24-3-510, et.seq., South Carolina Code of Laws, 1976, the South Carolina Department of Corrections will conduct in a responsible, secure, and humane manner, the execution of inmates condemned to death. The South Carolina Department of Corrections will ensure the safety and security of the public and will have the absolute responsibility of providing for the security of those individuals awaiting execution.

POLICY DIRECTIVES:

1. Pursuant to the requirements of Section 24-3-510, et.seq., South Carolina Code of Laws, 1976, officials of the South Carolina Department of Corrections will carry out the responsible and humane execution of inmates sentenced to death.
2. Unless noted otherwise throughout this policy, the Agency Director will designate the Deputy Director for Operations to be responsible for developing the detailed procedures to be followed prior to, during, and subsequent to an execution, and for designating in writing those officials responsible for implementing these procedures (see SCDC Procedure SK-22.03(OP)). The Deputy Director for Operations will be responsible for the direct supervision of the execution process.
3. **ELECTION OF EXECUTION METHOD:** Effective June 8, 1995, Section 24-3-530, South Carolina Code of Laws, 1976, was revised to allow those persons sentenced to death to elect that death be by electrocution or by lethal injection, as follows:

- a. Those individuals sentenced to death on or after June 8, 1995, are required to make their election in writing no later than 14 days before the execution date or it is waived. If the person waives the right of election, then death will be administered by lethal injection.
 - b. Those individuals sentenced to death prior to June 8, 1995, must be administered death by electrocution unless they elect death by lethal injection in writing no later than 14 days before their scheduled execution date.
4. If the method of death elected is lethal injection, the South Carolina Department of Corrections will comply with all state and federal requirements and statutes regarding the registration, dispensing, distribution, transportation, administration, and disposal of all controlled substances used to carry out the execution.
5. The South Carolina Department of Corrections will carry out all death sentences no sooner than the fourth Friday immediately following the receipt of the Order from the Clerk of Court of the South Carolina Supreme Court at a time to be determined by the Agency Director.
6. **CLASSIFICATION AND HOUSING OF INMATES SENTENCED TO DEATH:**
 - a. All inmates sentenced to death will be transferred to the custody of the South Carolina Department of Corrections and will be placed in "Death Row" status pursuant to the provisions of Section 24-3-510, South Carolina Code of Laws, 1976. Male inmates placed in "Death Row" status will initially be housed at the Lieber Correctional Institution (LCI). Females inmates sentenced to death will initially be housed at the Women's Correctional Institution (WoCI).
 - b. Upon receipt of the Order from the Clerk of Court of the South Carolina Supreme Court that authorizes and sets the date of the execution, inmates housed in Death Row status will be considered to be on "Execution Status" and will be placed in Special Management housing. (**NOTE:** Copies of the Execution Order will immediately be forwarded to the Warden, Broad River Correctional Institution (BRCI) and the General Counsel.) Inmates placed on Execution Status will remain housed at LCI (in the case of females, at the WoCI). The exact date and time of transfer to the Capital Punishment Facility at the Broad River Correctional Institution will be coordinated between the Wardens of BRCI and LCI and approved by the Deputy Director for Operations. This information will be kept confidential for security reasons.
 - c. The South Carolina Department of Corrections will have the responsibility of providing for the security of those individuals awaiting execution while they are housed at either the LCI, WoCI, or the CPF.
7. **SELECTION OF WITNESSES TO THE EXECUTION:** The selection of witnesses to the execution will be conducted pursuant to the provisions of existing and current state statute(s), and the following:

- a. The approval of all witnesses will be coordinated in advance through the Director, Office of Executive Affairs, in consultation with the Agency Director.
 - b. All selected witnesses will be required to abide by the security requirements imposed by the South Carolina Department of Corrections.
8. **SELECTION OF EXECUTIONERS:** Designated executioners will be selected from employee volunteers by the Deputy Director for Operations and will be approved by the Agency Director. Under no circumstances will any employee of the South Carolina Department of Corrections having any relationship or association to either the victim, victim's family, or to the condemned inmate be selected as an executioner. Every effort will be made by officials of the South Carolina Department of Corrections to protect the anonymity and confidentiality of executioners.
9. **VISITING PRIVILEGES FOR CONDEMNED INMATES:** The South Carolina Department of Corrections will provide inmates housed in Execution Status with the opportunity to receive visits as specified in SCDC Procedure SK-22.03(OP), "Execution Directives." Visitation privileges may be further limited and modified to protect the security of the institution and the safety of the inmate, visitors, and the public.
10. **PUBLIC AND NEWS MEDIA RELATIONS:** As directed by the Agency Director, the Director, Office of Executive Affairs will be responsible for the following:
 - a. coordinating all press briefings;
 - b. approval of the release of any information to any media representative, either directly or indirectly related to the execution, to include any information released concerning the condemned inmate; and
 - c. development, coordination, and implementation of all procedures concerning news media relations prior to, during, and following the execution of the condemned inmate.
11. **EXECUTIVE CLEMENCY:** Pursuant to state statute, the Governor may commute an inmate's sentence at any time prior to the execution. The Agency will ensure that all pertinent information needed by the Governor concerning the inmate is forwarded in a timely manner and will ensure that open lines of communication are made available to relay last minute clemency information.
12. **POST EXECUTION AND DISPOSITION OF BODY:** The South Carolina Department of Corrections will be responsible for ensuring that all state statutes are complied with concerning the official certification of the execution and the disposition of the deceased inmate's body.
13. **EXPENSES:** Pursuant to state statute, the following provisions will apply concerning the payment of expenses:

SK-22.03

Page 4

- a. the South Carolina Department of Corrections will pay the costs associated with executing the death penalty (whether by electrocution or by lethal injection);
 - b. the county in which the inmate was sentenced will bear all the costs associated with transporting the inmate to the Department of Corrections.
14. Specific execution procedures related to this policy will be developed and approved by the Deputy Director for Operations and the Agency Director and maintained in a secured file at the BRCI for immediate implementation upon receipt of the Order from the Clerk of Court of the scheduled execution. The Agency Director will approve the distribution of these procedures to other SCDC officials as deemed necessary.
15. Within statutory limitations, the Agency Director or his/her approved designee(s) reserves the right to modify these and any other Agency directives and procedures at any time to enhance the security and safety of the Agency, public, staff, and inmates. This includes, but is not limited to, terminating inmate visitation privileges on the date of executions, adjusting employee work hours on the date of executions, etc. In addition, the Warden, BRCI, is granted the authority to make necessary internal operational and scheduling changes with the concurrence of the Deputy Director for Operations to facilitate the safety and security of that particular institution on the date of a scheduled execution.



William D. Catoe



**SOUTH CAROLINA
DEPARTMENT OF CORRECTIONS**

OPERATIONS

OPERATIONS MANUAL

<u>PROCEDURE NUMBER:</u>	SK-22.03(OP)
<u>PROCEDURE TITLE:</u>	EXECUTION PROCEDURES
<u>ISSUE DATE:</u>	January 5, 1999
<u>RELEVANT SCDC POLICY:</u>	SK-22.03
<u>SUPERSEDES:</u>	SK-22.03(OP) (September 16, 1998) SK-22.03(OP) (November 1, 1997)
<u>RESPONSIBLE AUTHORITY:</u>	Deputy Director for Operations
<u>RELATED SCDC FORMS:</u>	NONE

SPECIFIC PROCEDURES:

1. RECEIPT OF EXECUTION ORDER:

- a. Upon the receipt of the order from the Clerk of Court of the execution, the Warden or designee, Lieber Correctional Institution (LCI), or if a female inmate, the Warden or designee, Women's Correctional Institution (WoCI), will read to the condemned inmate the Execution Order, or allow the condemned inmate to read it himself/herself. The inmate may contact his/her attorney if s/he deems it necessary. The inmate will acknowledge receipt of the Order of Execution by signing four (4) copies of the Affidavit of Service. S/he will be acknowledging that s/he has read or has had the Order of Execution read and s/he understands it. The inmate will retain one (1) copy, one (1) copy will be forwarded to the Office of General Counsel, one (1) copy will be retained at the institution, and one (1) certified copy will be remitted to the Clerk of Court of the South Carolina Supreme Court. The Warden will also discuss with the inmate his/her desired funeral arrangements and disposition of personal funds and property.
- b. After the Execution Order has been served, the inmate will be considered to be on "Execution Status" and will be placed in 24-hour Special Management housing. Males inmates placed on Execution Status will be housed in the U-1 Unit at Lieber Correctional Institution (LCI), and female inmates will be housed at the Women's Correctional Institution (WoCI).

- 2. TIME OF EXECUTION:** The South Carolina Department of Corrections will carry out all death sentences on the fourth Friday immediately following the receipt of the Order from the Clerk of Court of the South Carolina Supreme Court at a time to be determined by the Agency Director.

- 3. ELECTION OF EXECUTION METHOD:** No later than 14 days prior to the execution, the Warden, LCI (or if a female, the Warden, WoCI), will meet with the inmate at which time the inmate will choose the method of execution. The inmate will then sign an Affidavit/Choice of Execution Method.

- a. If the inmate declines to choose and was sentenced prior to June 8, 1995, the method of execution will be by electrocution.
- b. If the inmate declines to choose and was sentenced on or after June 8, 1995, the method of execution will be by lethal injection.

The inmate's decision is irrevocable. If the inmate refuses to sign the Affidavit/Choice of Execution Method, an officially notarized affidavit will be prepared for the Warden's signature and two (2) other officials as witnesses. The copy of the affidavit will be attached to the Affidavit/Choice of Execution Method. A copy of the Affidavit will also immediately be provided by the Warden, LCI, to the Deputy Director for Operations and to the Warden, Broad River Correctional Institution (BRCI).

4. **MOVEMENT OF INMATE TO THE CAPITAL PUNISHMENT FACILITY (CPF):**

- a. The exact date and time of the inmate's transfer to the CPF will be coordinated by the Warden (BRCI) and the Warden, LCI, and will be approved by the Deputy Director for Operations. This information will be kept confidential for security reasons.
- b. Prior to the inmate being moved to the CPF, his/her personal property will be inventoried, recorded, and secured in the Lieber or Women's Correctional Institution Property Control Room for disposition in accordance with the inmate's written instructions. A packet containing the original copies of all documents executed by the inmate since receipt of the Execution Order, i.e., funeral arrangement documents, property disposition forms, etc., will be hand-carried to the Warden, BRCI. The inmate will be taken to the BRCI Identification Section by a BRCI Associate Warden or Captain and at least two (2) assistants, one (1) of which will be of the same sex as the inmate. At that time, the inmate will be photographed and fingerprinted, and a positive identification will be made. The inmate will then receive a physical examination and a body cavity search will be conducted by medical personnel. The inmate will be briefed by the Warden on procedures while in the CPF. Legal counsel may be present during these proceedings if requested by the inmate. An attorney from the SCDC Office of General Counsel will read the execution order to the inmate after arrival at the CPF prior to the execution.

5. **SECURITY OF CPF:** The South Carolina Department of Corrections has the absolute responsibility to provide security for those individuals awaiting execution. There will at all times be at least four (4) Correctional Officers and one (1) supervisory level staff member in the CPF when it is occupied prior to an execution. There will always be at least two (2) female staff members on duty when a female is housed at the CPF.

6. **VISITING PRIVILEGES:**

- a. Upon placement of the inmate on Execution Status at Lieber Correctional Institution or the Women's Correctional Institution, the following individuals will be authorized to participate in visits with the condemned inmate while s/he is housed at Lieber Correctional or the Women's Correctional Institution, provided

that each visitor provides advanced notice and is approved by the Deputy Director for Operations or designee.

- (1) immediate family members as outlined in SCDC Procedure OP-22.09(OP), "Inmate Visitation," will be permitted non-contact visits. However, family members may be authorized one (1) contact visit while the inmate is on Execution Status with the approval of the Warden or designee.
- (2) clergy (no more than two [2]) may visit the inmate. The Institutional Chaplain will be responsible for coordinating with members of the clergy who wish to visit with the condemned inmate, and providing the name(s) of the clergy to the Warden or designee and to the Chief of the Pastoral Services Branch. The Chief of the Pastoral Services Branch and the Warden or designee will approve/disapprove clergy visits. These visits may be contact visits with the approval of the Warden or designee.
- (3) attorneys (no more than [2] attorneys of record in any court [or a combination of (1) attorney and (1) authorized paralegal]) may visit the inmate. Attorney visits may be contact visits with the approval of the Warden or designee. Paralegals visits will be non-contact visits. Verification that the attorney who is requesting a visit is the condemned inmate's attorney will be provided by the SCDC General Counsel's office.

b. **Visitation at the Broad River Correctional Institution Capital Punishment Facility (CPF):**

- (1) There will be no family visitation at the CPF of the BRCI if the inmate is transported on the day of the execution. Family visitation will be allowed at the CPF if the inmate is transported prior to the day of the execution. This visit will be non-contact and will be limited to no more than two (2) persons at a time.
- (2) Attorneys and clergy members will be allowed to visit the condemned inmate at the CPF, but the total number of visitors will be limited to no more than two (2) persons at a time. These visits may be contact visits with the approval of the Warden or designee. Verification that the attorney who is requesting a visit is the condemned inmate's attorney will be provided by the SCDC General Counsel's office. The BRCI Chaplain will be responsible for coordinating with members of the clergy who wish to visit with the condemned inmate, and providing the name(s) of the clergy to the BRCI Warden or designee and to the Chief of the Pastoral Services Branch. The Chief of the Pastoral Services Branch and the BRCI Warden or designee will approve/disapprove clergy visits.

- c. Visitors will be advised of the parameters of visits to include location, hours, duration of visit, contact or non-contact status, and related security procedures. All persons who enter Death Row and the Capital Punishment Facility will be subject to frisk searches.

7. **SELECTION OF WITNESSES:**

- a. Witnesses to the execution will consist of no more than eight (8) respectable citizens of the State of South Carolina, to include:
 - (1) up to three (3) witnesses designated by the family of the victim; (**NOTE:** If there is more than one [1] victim, the Agency Director may reduce the number of family representatives to one [1] representative for each victim's family; provided, further, that if there are more than two [2] victims, the Agency Director may restrict the total number of victims' representatives in accordance with the space limitations of the CPF.)
 - (2) up to three (3) media representatives (see Procedure 10. c.);
 - (3) the Solicitor, or an Assistant Solicitor designated by the Solicitor, of the county where the offense occurred; and
 - (4) the chief law enforcement officer, or an officer designated by the chief, from the law enforcement agency that had original jurisdiction in the case.
- b. All witnesses will be approved in writing in advance by the Director, Office of Executive Affairs, in consultation with the Agency Director. The only exception to this directive will be in the case of media representatives. The selection of media representatives to serve as official witnesses to any execution will be coordinated through the Director, Office of Executive Affairs, in consultation with the Agency Director (see Procedure 10. c.).
- c. In addition, the Agency Director will be responsible for appointing an official, non-SCDC observer to witness all pertinent activities associated with the execution. The observer's duties will commence with the transfer of the inmate to the CPF and will end after the transfer of the executed inmate from the CPF to the hearse.
- d. All selected witnesses will be required to abide by the security requirements imposed by the South Carolina Department of Corrections. Failure to comply with these directives will result in immediate removal as a witness.
- e. Under no circumstances will any audio recorders, cameras, telephonic equipment or other recording devices be allowed inside the CPF during the execution.
- f. Orientation will be conducted by the Director, Office of Executive Affairs or designee for witnesses as to their duties and responsibilities.

8. **SELECTION OF EXECUTIONERS:** Designated executioners will be selected from employee volunteers of the South Carolina Department of Corrections, under the following guidelines:

- a. Executioners will be selected by the Deputy Director for Operations and will be approved by the Agency Director.

- b. Under no circumstances will any employee of the South Carolina Department of Corrections having any relationship or association to either the victim, victim's family, or to the condemned inmate be selected as an executioner.
- c. The identity of all executioners will be kept strictly confidential. Every effort will be made by officials of the South Carolina Department of Corrections to protect the anonymity of executioners.

9. **NOTIFICATION AND ADVISEMENT OF LAW ENFORCEMENT AGENCIES:**

An Assistant to the Deputy Director for Operations will serve in the capacity of Law Enforcement Coordinator and will also be responsible for notifying appropriate SCDC personnel. In addition, an Assistant to the Deputy Director for Operations will be responsible for coordinating and making arrangements for the safe and secure assembly of protesters and supporters of the execution on or near the front grounds of the Broad River Complex.

10. **PUBLIC AND NEWS MEDIA RELATIONS:** As directed by the Agency Director, the Director, Office of Executive Affairs will be responsible for all news media contact, to include the following:

- a. No news media interviews will be permitted with the condemned inmate or any other inmates as prescribed by current SCDC Procedure, GA-02.01(OP), "Inmate and Employee Relations with News Media and Others."

b. **Press Briefings:**

- (1) The Director, Office of Executive Affairs, will conduct a final press briefing immediately following the execution.
- (2) Any news media representatives desiring to be admitted to the Broad River Complex grounds on the day of the scheduled execution will be escorted by the Director, Office of Executive Affairs, or designee. The press will not interfere with on-duty SCDC employees. Media representatives will not be allowed to interview the Warden or other employees of BRCI, LCI, or WoCI.
- (3) The Director, Office of Executive Affairs, will arrange for background briefings to be completed prior to receipt and service of a death warrant.

c. **News Media Witnesses:**

- (1) The South Carolina Press Association and the Radio-Television News Directors' Association of the Carolinas will each select one (1) media representative to act as an official witness to the execution and one (1) alternate witness to be available in case the official witness is unable to attend the execution. The dominant wire service will appoint one (1) representative and (1) alternate. These choices will be made at least two (2) weeks prior to the execution and submitted to the Director, Office of Executive Affairs.

- (a) The media representatives selected as witnesses must be “respectable citizens” of the State of South Carolina and must perform all duties required of official execution witnesses. They will be escorted to and from the Execution Chamber Witness Area as provided for in this procedure.
- (b) Because of the high level of security that must be maintained during an execution, the Director, Office of Executive Affairs, must (in consultation with the Agency Director) approve the media witnesses chosen. Also, if the South Carolina Press Association and the Radio-Television News Directors’ Association of the Carolinas and the dominant wire service fail to make their choices, or if the official witness and alternate chosen by one (1) or more of the organizations are not present, the Director, Office of Executive Affairs, will (in consultation with the Agency Director) choose a witness from the news media representatives available on site at the time immediately prior to the execution.
- (2) All witnesses will be searched by a Correctional Officer prior to entering the CPF, as no cameras or electronic recording devices will be allowed in the witness area. Only a writing pad and writing and drawing (sketching) implements will be permitted in the Execution Chamber Witness Area of the CPF.
- (3) All witnesses must sign the Execution Certificate in the witness waiting area in the CPF immediately after being excused from the witness chamber. The Director, Office of Executive Affairs will be responsible for transporting media witnesses from the CPF to a designated area on the grounds of the Broad River Complex.
- (4) The SCDC General Counsel will ensure that necessary witness documents are available and properly completed in the CPF.

11. **VISITATION BY CHAPLAINS AND MEMBERS OF THE CLERGY:**

- a. The Department of Corrections is aware of its responsibility to provide for the spiritual welfare of inmates awaiting execution. Thus, it will be the responsibility of the Senior or Assistant Chaplain to make periodic visits to inmates awaiting execution, remain available, and assist in sustaining these inmates' spiritual welfare as may be necessary or desired.
- b. Upon arrival of the inmate at the CPF, the Senior Institutional Chaplain will immediately notify a member of the condemned inmate's immediate family and the inmate's minister. The Chaplain, if desired by the inmate, may be present when the inmate is moved to the CPF.
- c. The Senior Chaplain or designee, if so desired by the condemned inmate, may be present when the inmate is being prepared for execution. The Chaplain may also accompany the inmate to the Execution Chamber.

- d. Clergy will be allowed, if preferred by the inmate and approved in writing by the Warden, BRCI, to spend as much time with the inmate as security requirements will allow. One (1) clergy member may be present at the execution.
- e. Religious Rites may be administered prior to the execution if the inmate so desires. Such Rites may be administered by the Institutional Chaplain or the Clergy. The sacraments needed to administer communion will be provided by the institution.

12. **EXECUTIVE CLEMENCY:** In order that the Governor may be apprised of the execution status of inmates remitted to the custody of the South Carolina Department of Corrections, at least ten (10) days prior to the date scheduled for an inmate's execution, a copy of that inmate's record, commitment paper, Federal Bureau of Investigation record, and other relevant documents will be hand-carried by the Director, Office of Executive Affairs, to the Governor's office for information, review, and consideration. The Governor may commute the inmate's sentence at any time prior to the execution. The Deputy Director for Operations will ensure that, at all times, the fastest possible telephonic communication is available to relay last-minute clemency to the Warden, BRCI. Upon notification of executive clemency, the Warden will immediately advise the inmate.

13. **TRAINING AND PREPARATION FOR EXECUTION:** It will be the responsibility of the Warden, BRCI, to train and prepare all individuals who are to participate in the actual carrying out of the death sentence. Practice sessions will be scheduled as needed. The number of these sessions will be prescribed by the Warden. Training sessions are not open to the news media or to any other person(s) not involved in carrying out the execution.

14. **CARRYING OUT OF EXECUTION:**

- a. The hour the actual execution is to be carried out will be determined by the Agency Director.
- b. If there is potential for disruptions during the execution process by any witness or participant, the Warden may deny access to the individual(s). Should a disruption occur during the procedures, the responsible individual(s) may be removed.
- c. The following individuals will be present in the CPF when the execution is carried out:

Physician	one (1)
Executioners	three (3) (if by electrocution) two (2) (if by lethal injection)
EMT or Physician's Assistant	two (2) (if by lethal injection)
Electricians	two (2) (one [1] of whom is an alternate) if execution is by electrocution
Warden	one (1)

Assistants to Warden	at least five (5) at the discretion of the Warden
Chaplain	one (1) (in the Execution Chamber if requested by the condemned inmate)
*Attorney	one (1) (in the witness area if requested by the condemned inmate)
Witnesses	eight (8) (as described in Procedure 7., above)
Official Non-SCDC Observer Appointed by the Agency Director)	one (1)

*This attorney must be an Attorney of Record or Legal Counsel approved by the Warden and requested by the inmate or Attorney of Record.

The above individuals will arrive at the CPF at a time prescribed by the Warden.

- d. All official witnesses, including news media representatives, will be escorted by the Director, Office of Executive Affairs to the CPF at least 15 minutes prior to the time of the scheduled execution.
- e. The actual execution will be carried out as prescribed by specific procedures developed to supplement these procedures and included as Attachment #1. The procedures outlined in Attachment #1 will be approved by the Deputy Director for Operations and by the Agency Director prior to being authorized for implementation. The Agency Director or an approved designee will be responsible for determining the SCDC officials who will be provided copies of the same.
- f. If the method of death elected is lethal injection, the South Carolina Department of Corrections will comply with all state and federal requirements and statutes regarding the registration, dispensing, distribution, transportation, and administration of all controlled substances and equipment.

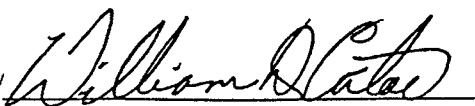
15. POST EXECUTION:

- a. A Certificate of Execution will be prepared by the General Counsel to be signed by the executioner and by the attending physician immediately following the execution. The completed Certificate of Execution will be forwarded via certified mail (return receipt) by the General Counsel to the Clerk of Court of the county from which the condemned inmate was sentenced and to the Clerk of the South Carolina Supreme Court.
- b. A Witness Certificate of Execution will be prepared by the General Counsel to be signed by all witnesses immediately following the execution. The completed certificate will be forwarded in the same manner as the Certificate of Execution described in #15.a., above.

- c. All controlled substances used to carry out the execution by lethal injection will be disposed of according to applicable state and federal regulations regarding controlled substances and equipment.

16. **DISPOSITION OF BODY:**

- a. Autopsy - In compliance with Agency policy and state law, an autopsy will be performed on the deceased inmate. Necessary arrangements will be made in advance by the Deputy Director for Health Services.
 - b. The Branch Chief, Pastoral Care Services, will contract with a local funeral home to (1) have the deceased inmate's body transported to a location designated by the Pathologist who is scheduled to perform the autopsy, and (2) ensure that the body is properly disposed of as prescribed by policy.
 - c. Upon completion of the autopsy, the deceased inmate's body may be released to a nearest relative as provided by state statute regarding Descent and Distribution. If the nearest relative refuses to claim the body, and if no other claim is made by relatives to the fifth degree of kinship, the body will be disposed of as are bodies of inmates who may die while in the custody of the South Carolina Department of Corrections. If the nearest relative desires that the body be transported to such person's former address in South Carolina, transportation expenses will be borne by the South Carolina Department of Corrections and a warrant will be drawn on the county treasurer from which the deceased was sentenced. The treasurer will then remit these expenses to the Department of Corrections and charge expense/cost to court expenses. If the body is transported outside the State of South Carolina, the cost will be at the relative's expense.
17. The Warden of the BRCI will ensure that stress-trauma debriefing and counseling is available for Execution Team members following the execution.
18. Within 30 days following the execution, the Warden, BRCI, will prepare and submit through appropriate channels to the Human Affairs Commission representative an after-action report of the execution.
19. Within statutory limitations, the Agency Director or his/her approved designee(s) reserves the right to modify these and any other Agency directives and procedures at any time to enhance the security and safety of the Agency, public, staff, and inmates. This includes, but is not limited to, terminating inmate visitation privileges on the date of an execution, adjusting employee work hours on the date of executions, etc. In addition, the Warden, BRCI, is granted the authority to make necessary internal operational and scheduling changes with the concurrence of the Deputy Director for Operations to facilitate the safety and security of that particular institution on the date of a scheduled execution.

S/ 
William D. Catoe

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
		<p><u>At Least :15 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. Witness Room curtain remains closed. 2. Witnesses enter the Witness Room.
<p><u>At Least :10 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. The Warden and at least three assistants will escort the inmate to Execution Chamber. 2. Execution Team members will place the inmate in the chair. 3. An Execution Team Member will apply conducting gel to the calf of the inmate's right leg and the crown of the inmate's head. 4. The Execution Team members will secure back arm straps, the forearm straps, and ankle straps. 5. When the inmate is secured, Execution Team will remove restrain apparatus, secure lap and chest straps. 6. Copper anklet and electrodes will be attached to the right leg by the Electrician. 7. The Electrician will place the copper headpiece and sponge on the condemned inmate's head and secure it. 8. Electrodes will be attached to the headpiece by the Electrician. 9. Witness Room Curtain will be opened. 10. The Electrician will place head restraint and hood over the inmate's head. 11. The Electrician will move to the equipment room and engage the circuit breaker. 	<p><u>At Least: 10 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. The Execution Team will enter the inmate's cell and the inmate will be restrained. 2. Inmate is escorted to the Execution Chamber and restrained to the table. 3. Once the EMT/PA's have completed the IV and heart monitor setup and returned to the Executioner's Room, the Execution Team members will move to the rear of the back curtain and will remain on standby. The Warden will order the Witness Room window curtain to be opened by a designated team member. 	

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
<ol style="list-style-type: none"> Sponges and ammonia chloride solution will be prepared at direction of the Warden. 		<ol style="list-style-type: none"> Phones will be checked. Training drill for all personnel involved will be held if directed by the Warden. Last meal will be ordered and will be served. The inmate will be allowed a shower/change of clothes.
	<p><u>At Least 9:00 Prior to Execution</u> Associate Warden or other persons authorized in the Controlled Substance Disposition Procedures will transport the lethal injection chemicals directly to the CPF Medical Room.</p>	
<p><u>At Least 1:15 Prior to Execution</u></p> <ol style="list-style-type: none"> An Execution Team member will supervise the shaving of the inmate's head with electric clippers and a safety razor, the shaving of the right leg of inmate from the knee to ankle, and the showering of the inmate. The Electricians will report to Execution Chamber for electrical preparation. 	<p><u>At Least 1:15 Prior to Execution</u> EMT/PA will mix lethal injection chemical according to Controlled Substance Disposition Procedures and carry chemical and supplies to the Executioner's room.</p>	<p><u>At Least 1:15 Prior to Execution</u></p> <ol style="list-style-type: none"> Phone in Execution Chamber will be checked by Warden and Intercom turned on. The inmate will be asked if s/he desires an injection of Valium. If the inmate requests the Valium, a 10 milligram intramuscular injection will be administered.
<p><u>At Least :45 Prior to Execution</u></p> <ol style="list-style-type: none"> Execution Team will report to CPF and final check will be made of equipment and associated paraphernalia. After showering, the inmate will be returned to the CPF and given clean clothes, which have the right trouser leg cut off at the knee. 	<p><u>At Least :45 Prior to Execution</u> Execution Team will report to CPF and final check will be made of equipment and associated paraphernalia.</p>	

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

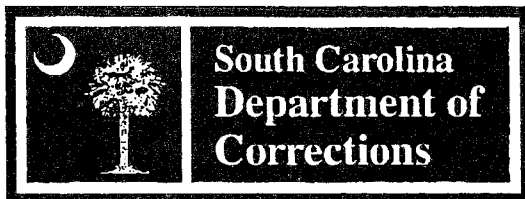
EXECUTION DAY (Continued)		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. Upon confirmation from the electricians that the circuit breaker has been engaged, the Warden will give the signal to the executioners to engage switches and the automatic cycle will begin. 2. Once the cycle runs its course, the Electrician will indicate the machine is off and disengage the manual circuit breaker in the equipment room. 3. Electrician will then enter the Execution Chamber, disconnect the electrodes from the inmate, and inform the Warden that it is safe for the EMT to examine the inmate. 	<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. The designated Executioners will begin the rapid flow of lethal chemicals in the following order: <ol style="list-style-type: none"> a. Pentothal (Thiopental) 2 grams (GM) b. Pavulon (Pancurium Bromide) 50 milligrams (MG) c. Potassium Chloride/150 milliequivalents (MEQ) 2. The designated team member keeping time will start a stop watch once the lethal chemicals have been injected. If the heart monitor does not indicate a flat line reading within ten (10) minutes, then a second set of lethal chemicals will be administered (Pavulon and Potassium Chloride only). The timekeeper will restart the stop watch after the second set of chemicals are administered. This process will continue until the physician determines that death has occurred. The team members designated to administer chemicals will remain in place until death has been determined and the front curtain is closed. 3. The EMT/PA will observe the heart monitor and signal the physician indicating a flat line reading. 	<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. If there is a final statement, the Warden will turn on the intercom and the inmate's attorney of record will read the final statement to the official witnesses. 2. The Warden will make a final check with the Deputy Director for Operations for any stays or commutations. 3. If there are no stays or commutations, the Warden signals that the execution will proceed.

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY (Continued)		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
		<ol style="list-style-type: none">1. The physician will determine that death has occurred and will advise the Warden. The Warden will announce the time of death.2. The Warden will advise that the sentence of the Court has been carried out, and he will ask the witnesses to exit the chamber and sign the Execution Certificate in the Witness Waiting Room.

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RESTRICTED

NUMBER: SK-22.03

TITLE: EXECUTION PROCEDURES

ISSUE DATE: MAY 1, 2002

RESPONSIBLE AUTHORITY: INSTITUTIONAL DIVISION DIRECTOR III

OPERATIONS MANUAL: OPERATIONS

SUPERSEDES: SK-22.03 (October 24, 2000)

RELEVANT SCDC FORMS/SUPPLIES: NONE

ACA/CAC STANDARDS: NONE

STATE/FEDERAL STATUTES: Sections 24-3-510; 24-3-520; 24-3-530; 24-3-540; 24-3-550; 24-3-560; and 24-3-570, S.C. Code of Laws, 1976, as amended

PURPOSE: To provide general guidelines for the development of procedures to be followed prior to, during, and subsequent to an execution and from which more detailed and specific operational directives can be developed.

POLICY STATEMENT: As required by state law, the South Carolina Department of Corrections will conduct in a responsible, secure, and humane manner, the execution of inmates condemned to death. The South Carolina Department of Corrections will ensure the safety and security of the public and will have the absolute responsibility of providing for the security of those individuals awaiting execution.

Note: The *Institutional Division Director III* may authorize a designee to carry out any of the duties and responsibilities assigned by this policy/procedure to a specific Warden.

SPECIFIC PROCEDURES:

1. RECEIPT OF EXECUTION ORDER:

1.1 Upon the receipt of the order from the Clerk of Court of the execution, the Warden or designee, Lieber Correctional Institution (LCI) or, if a female inmate, the Warden or designee, Women's Correctional Institution (WoCI), will read to the condemned inmate the Execution Order, or allow the condemned inmate to read it himself/herself. The inmate may contact his/her attorney if s/he wishes

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to do so. The inmate will acknowledge receipt of the Order of Execution by signing four (4) copies of the Affidavit of Service. S/he will be acknowledging that s/he has read or has had the Order of Execution read and s/he understands it. If the inmate refuses to sign or is unable to sign, the warden/designee and one other witness will sign the affidavit to show that the affidavit was served to the inmate. The inmate will retain one (1) copy, one (1) copy will be forwarded to the Office of General Counsel, one (1) copy will be retained at the institution, and one (1) certified copy will be remitted to the Clerk of Court of the South Carolina Supreme Court. The Warden will also discuss with the inmate his/her desired funeral arrangements and disposition of personal funds and property.

1.2 After the Execution Order has been served, the inmate will be considered to be on "Execution Status" and will be placed in 24-hour Special Management housing. Male inmates placed on Execution Status will be housed in the U-1 Unit at Lieber Correctional Institution (LCI), and female inmates will be housed at the Women's Correctional Institution (WoCI).

2. **TIME OF EXECUTION:** The South Carolina Department of Corrections will carry out all death sentences on the fourth Friday immediately following the service of the Execution Order from the Clerk of the South Carolina Supreme Court to the inmate. The time of execution will be determined by the Agency Director.

3. **ELECTION OF EXECUTION METHOD:** No later than 14 days prior to the execution, the Warden, LCI (or, if a female, the Warden, WoCI), will meet with the inmate, at which time the inmate will choose the method of execution. The inmate will then sign an Affidavit/Choice of Execution Method.

3.1 If the inmate declines to choose and was sentenced prior to June 8, 1995, the method of execution will be by electrocution.

3.2 If the inmate declines to choose and was sentenced on or after June 8, 1995, the method of execution will be by lethal injection.

The inmate's decision is irrevocable. If the inmate refuses to sign the Affidavit/Choice of Execution Method, an officially notarized affidavit will be prepared for the Warden's signature and two (2) other officials as witnesses. The copy of the affidavit will be attached to the Affidavit/Choice of Execution Method. A copy of the Affidavit will also immediately be provided by the Warden, LCI, (or, if a female, the Warden, WoCI) to the *Institutional Division Director III*, and to the Warden, Broad River Correctional Institution (BRCI).

4. **MOVEMENT OF INMATE TO THE CAPITAL PUNISHMENT FACILITY (CPF):**

4.1 The exact date and time of the inmate's transfer to the CPF will be coordinated by the Warden, BRCI and the Warden, LCI, (or, if a female, the Warden, WoCI) and will be approved by the *Institutional Division Director III*. This information will be kept confidential for security reasons.

4.2 Prior to the inmate being moved to the CPF, his/her personal property will be inventoried, recorded, and secured in the Lieber or Women's Correctional Institution Property Control Room for disposition in accordance with the inmate's written instructions. A packet containing the original copies

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of all documents *completed/written* by the inmate since receipt of the Execution Order, i.e., funeral arrangement documents, property disposition forms, etc., will be hand-carried to the Warden, BRCI.

The inmate will be taken to the BRCI Identification Section by a BRCI Associate Warden, Major, or Captain and at least two (2) assistants, one (1) of whom will be of the same sex as the inmate. At that time, the inmate will be photographed and fingerprinted, and a positive identification will be made. The inmate will then receive a physical examination, and a body cavity search will be conducted by medical personnel. The inmate will be briefed by the Warden on procedures while in the CPF. *The inmate's* legal counsel may be present during these proceedings if requested by the inmate. An attorney from the SCDC Office of General Counsel will read the execution order to the inmate after arrival at the CPF prior to the execution.

5. SECURITY OF CPF: The South Carolina Department of Corrections has the absolute responsibility to provide security for those individuals awaiting execution. There will at all times be at least four (4) Correctional Officers and one (1) supervisory level staff member in the CPF when it is occupied prior to an execution. There will always be at least two (2) female staff members on duty when a female is housed at the CPF.

6. VISITING PRIVILEGES:

6.1 Upon placement of the inmate on Execution Status at Lieber Correctional Institution or the Women's Correctional Institution, the following individuals will be authorized to participate in visits with the condemned inmate while s/he is housed at Lieber Correctional or the Women's Correctional Institution, provided that each visitor provides advance notice and is then approved by the respective Warden or designee:

6.1.1 immediate family members as outlined in SCDC Policy/Procedure OP-22.09, "Inmate Visitation," will be permitted non-contact visits. However, prior to the execution of the inmate, the father, mother, spouse, and children may be authorized one (1) contact visit *per week* with the approval of the Warden or designee. *However, if the inmate or his/her visitor violate any law, policy/procedure, or institutional rule or regulation during any contact visit, the visit will be terminated and no additional contact visits will be authorized for the remainder of the inmate's time on Execution Status.*

6.1.2 clergy (no more than two [2]) may visit the inmate. The Institutional Chaplain will be responsible for coordinating with members of the clergy who wish to visit with the condemned inmate, and providing the name(s) of the clergy to the Warden or designee and to the Chief of the Pastoral Care Services Branch. The Chief of the Pastoral Care Services Branch and the Warden or designee will approve/disapprove clergy visits. These visits may be contact visits with the approval of the Warden or designee.

6.1.3 attorneys (no more than [2] attorneys of record in any court [or a combination of (1) attorney and (1) authorized paralegal]) may visit the inmate. Attorney visits may be contact visits with the approval of the Warden or designee. All paralegal visits will be non-contact visits. Verification that the attorney who is requesting a visit is the condemned inmate's attorney will be provided by the SCDC General Counsel's office.

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6.2 Visitation at the Broad River Correctional Institution Capital Punishment Facility (CPF):

6.2.1 There will be no family visitation at the CPF of the BRCI if the inmate is transported on the day of the execution. Family visitation will be allowed at the CPF if the inmate is transported prior to the day of the execution. This visit will be non-contact and will be limited to no more than two (2) persons at a time.

6.2.2 Attorneys and clergy members will be allowed to visit the condemned inmate at the CPF, but the total number of visitors will be limited to no more than two (2) persons at a time. These visits may be contact visits with the approval of the Warden or designee. Verification that the attorney who is requesting a visit is the condemned inmate's attorney will be provided by the SCDC General Counsel's office. The BRCI Chaplain will be responsible for coordinating with members of the clergy who wish to visit with the condemned inmate, and providing the name(s) of the clergy to the BRCI Warden or designee and to the Chief of the Pastoral Care Services Branch. The Chief of the Pastoral Care Services Branch and the BRCI Warden or designee will approve/disapprove clergy visits.

6.3 Visitors will be advised of the parameters of visits, to include location, hours, duration of visit, contact or non-contact status, and related security procedures. All persons who enter Death Row and the Capital Punishment Facility will be subject to frisk searches.

7. LAST MEAL: While at Lieber Correctional Institution (or Women's Correctional Institution, if female), and no later than 14 days prior to the execution date, the condemned inmate will sign a statement requesting his/her last meal. The last meal request will be forwarded to the Warden of BRCI and will be honored as long as the request is reasonable. The Warden of BRCI will designate a staff member to procure the ingredients, prepare the last meal, and ensure that the meal is served at the appropriate time.

8. SELECTION OF WITNESSES:

8.1 Witnesses to the execution will consist of no more than eight (8) respectable citizens of the State of South Carolina, to include:

8.1.1 up to three (3) witnesses designated by the family of the victim; (NOTE: If there is more than one [1] victim, the Agency Director may reduce the number of family representatives to one [1] representative for each victim's family; provided, further, that if there are more than two [2] victims, the Agency Director may restrict the total number of victims' representatives in accordance with the space limitations of the CPF.)

8.1.2 up to three (3) media representatives (see Procedures 11.3 through 11.3.6, below);

8.1.3 the Solicitor, or an Assistant Solicitor designated by the Solicitor, from the judicial circuit which includes the county where the offense occurred; and

8.1.4 the chief law enforcement officer, or an officer designated by the chief, from the law enforcement agency that had original jurisdiction in the case.

8.1.5 the condemned person's counsel (if requested by the inmate).

8.1.6 the condemned person's religious leader (if requested by the inmate).

(Note: The inmate may substitute one person from his immediate family for either his counsel or religious leader, or two persons from his immediate family for both his counsel and religious leader. See Paragraph 16.3, below, for additional information.)

8.2 All witnesses will be approved in writing in advance by the *Inspector General*, in consultation with the Agency Director. The only exception to this directive will be in the case of media representatives. The selection of media representatives to serve as official witnesses to any execution will be coordinated through the *Director, Office of Communications and Public Affairs*, in consultation with the Agency Director (see Procedures 11.3 through 11.3.6, below).

8.3 In addition, the Agency Director will be responsible for appointing an official, non-SCDC observer to witness all pertinent activities associated with the execution. The observer's duties will commence with the transfer of the inmate to the CPF and will end after the transfer of the executed inmate from the CPF to the hearse.

8.4 All selected witnesses will be required to abide by the security requirements imposed by the South Carolina Department of Corrections. Failure to comply with these directives will result in immediate removal as a witness.

8.5 Under no circumstances will any audio recorders, cameras, telephonic equipment, or other recording devices be allowed inside the CPF during the execution.

8.6 Orientation will be conducted by the *Director, Office of Communications and Public Affairs*, in conjunction with the *Director, Division of Victim Services* or designee for witnesses as to their duties and responsibilities.

9. SELECTION OF EXECUTIONERS: Designated executioners will be selected from employee volunteers of the South Carolina Department of Corrections, under the following guidelines:

9.1 Executioners will be selected by the *Institutional Division Director III* and will be approved by the Agency Director.

9.2 Under no circumstances will **any** employee of the South Carolina Department of Corrections having any relationship or association to either the victim or victim's family or to the condemned inmate be selected as an executioner.

9.3 The identity of all executioners will be kept strictly confidential. Every effort will be made by officials of the South Carolina Department of Corrections to protect the anonymity of executioners.

10. NOTIFICATION AND ADVISEMENT OF LAW ENFORCEMENT AGENCIES: The *Institutional Division Director III* will serve in the capacity of Law Enforcement Coordinator and will

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also be responsible for notifying appropriate SCDC personnel. In addition, the *Institutional Division Director III* will be responsible for coordinating and making arrangements for the safe and secure assembly of protesters and supporters of the execution on or near the front grounds of the Broad River Complex.

11. PUBLIC AND NEWS MEDIA RELATIONS: As directed by the Agency Director, the *Director, Office of Communications and Public Affairs*, will be responsible for all news media contact, to include the following:

11.1 No news media interviews will be permitted with the condemned inmate or any other inmates as prescribed by current SCDC Policy/Procedure GA-02.01, "Inmate and Employee Relations with News Media and Others."

11.2 Press Briefings:

11.2.1 The *Director, Office of Communications and Public Affairs*, or designee will conduct a final press briefing immediately following the execution.

11.2.2 Any news media representatives desiring to be admitted to the Broad River Complex grounds on the day of the scheduled execution will be escorted by the *Director, Office of Communications and Public Affairs*, or designee. The press will not interfere with on-duty SCDC employees. Media representatives will not be allowed to interview the Warden or other employees of BRCI, LCI, or WoCI.

11.2.3 The *Director, Office of Communications and Public Affairs*, will arrange for background briefings to be completed prior to receipt and service of a death warrant.

11.3 News Media Witnesses:

11.3.1 The South Carolina Press Association and the Radio-Television News Directors' Association of the Carolinas will each select one (1) media representative to act as an official witness to the execution and one (1) alternate witness to be available in case the official witness is unable to attend the execution. The dominant wire service will appoint one (1) representative and one (1) alternate. These choices will be made at least two (2) weeks prior to the execution and submitted to the *Director, Office of Communications and Public Affairs*.

11.3.2 The media representatives selected as witnesses must be "respectable citizens" of the State of South Carolina and must perform all duties required of official execution witnesses. They will be escorted to and from the Execution Chamber Witness Area as provided for in this procedure.

11.3.3 Because of the high level of security that must be maintained during an execution, the *Director, Office of Communications and Public Affairs*, must (in consultation with the Agency Director) approve the media witnesses chosen. Also, if the South Carolina Press Association and the Radio-Television News Directors' Association of the Carolinas and the dominant wire service fail to make their choices, or if the official witness and alternate chosen by one (1) or

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more of the organizations are not present, the *Director, Office of Communications and Public Affairs*, will (in consultation with the Agency Director) choose a witness from the news media representatives available on site at the time immediately prior to the execution.

11.3.4 All witnesses will be searched by a Correctional Officer prior to entering the CPF, as no cameras or electronic recording devices will be allowed in the witness area. Only *media representatives will be allowed to have* a writing pad and writing and drawing (sketching) implements in the Execution Chamber Witness Area of the CPF.

11.3.5 All witnesses must sign the Execution Certificate in the witness waiting area in the CPF immediately after being excused from the witness chamber. The *Director, Office of Communications and Public Affairs*, will be responsible for transporting media witnesses from the CPF to a designated area on the grounds of the Broad River Complex.

11.3.6 The SCDC General Counsel will ensure that necessary witness documents are available and properly completed in the CPF.

12. VISITATION BY CHAPLAINS AND MEMBERS OF THE CLERGY:

12.1 The Department of Corrections is aware of its responsibility to provide for the spiritual welfare of inmates awaiting execution. Thus, it will be the responsibility of the Senior or Assistant Chaplain to make periodic visits to inmates awaiting execution, remain available, and assist in sustaining these inmates' spiritual welfare as may be necessary or desired.

12.2 Upon arrival of the inmate at the CPF, the Senior Institutional Chaplain will immediately notify a member of the condemned inmate's immediate family and the inmate's minister. The Chaplain, if desired by the inmate, may be present when the inmate is moved to the CPF.

12.3 The Senior Chaplain or designee, if so desired by the condemned inmate, may be present when the inmate is being prepared for execution. The Chaplain may also accompany the inmate to the Execution Chamber.

12.4 Clergy will be allowed, if preferred by the inmate and approved in writing by the Warden, BRCL, to spend as much time with the inmate as security requirements will allow. One (1) clergy member may be present at the execution.

12.5 Religious Rites may be administered prior to the execution if the inmate so desires. Such Rites may be administered by the Institutional Chaplain or the Clergy. The sacraments needed to administer communion will be provided by the institution.

13. **EXECUTIVE CLEMENCY:** In order that the Governor may be apprised of the execution status of inmates remitted to the custody of the South Carolina Department of Corrections, at least ten (10) days prior to the date scheduled for an inmate's execution, a copy of that inmate's record, commitment paper, Federal Bureau of Investigation record, and other relevant documents will be hand-carried by the *General Counsel* to the Governor's office for information, review, and consideration. The Governor may commute the inmate's sentence at any time prior to the execution. The *Institutional*

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Division Director III will ensure that, at all times, the fastest possible telephonic communication is available to relay last-minute clemency to the Warden, BRCI. Upon notification of executive clemency, the Warden will immediately advise the inmate.

14. TRAINING AND PREPARATION FOR EXECUTION: It will be the responsibility of the Warden, BRCI, to train and prepare all individuals who are to participate in the actual carrying out of the death sentence. Practice sessions will be scheduled as needed. The number of these sessions will be prescribed by the Warden. Training sessions are not open to the news media or to any other person(s) not involved in carrying out the execution.

15. HEALTH SERVICES RESPONSIBILITIES:

15.1 Arranging for autopsy and notifying the coroner of pending execution;

15.2 Preparing the death certificate for the medical doctor to sign;

15.3 Preparing the body removal permit;

15.4 Ensuring that the inmate's medical record is current and is prepared to accompany the body to the coroner's office;

15.5 Conducting a medical exam and body cavity search prior to the execution; and

15.6 At least seven (7) days prior to the inmate's arrival to BRCI, reviewing the medical record for possible history of drug abuse and conducting a physical examination to ascertain the condition of the inmate's veins at all potential IV sites; and advising the Warden of any abnormalities immediately and ensuring that the attending surgeon is briefed.

16. CARRYING OUT OF EXECUTION:

16.1 The hour the actual execution is to be carried out will be determined by the Agency Director.

16.2 If there is potential for disruption during the execution process by any witness or participant, the Warden may deny access to the individual(s). Should a disruption occur during the procedures, the responsible individual(s) may be removed.

16.3 The following individuals will be present in the CPF when the execution is carried out:

Physician	one (1)
Executioners	three (3) (if by electrocution), or two (2) (if by lethal injection)
EMT or Physician's Assistant	two (2) (if by lethal injection), or none (if by electrocution)

- Electricians two (2) (one [1] of whom is an alternate) if execution is by electrocution
- Warden one (1)
- Assistants to Warden at least five (5) at the discretion of the Warden
- *Religious Leader one (1) (if requested by the condemned inmate)
- *Attorney one (1) (if requested by the condemned inmate)
- Witnesses eight (8) (as described in Procedure 8.1.1 through 8.1.6, above)

- Official Non-SCDC Observer (Appointed by the Agency Director) one (1)

*(The attorney must be an Attorney of Record or Legal Counsel approved by the Warden and requested by the inmate or Attorney of Record. However, the inmate may substitute one person from his immediate family for either his counsel or religious leader, or two persons from his immediate family for both his counsel and religious leader. For purposes of this item, 'immediate family' means those persons eighteen years of age or older who are related to the convict by blood, adoption, or marriage within the second degree of consanguinity. Questions about whether or not a proposed substitute is an immediate family member should be addressed to the Office of General Counsel.)

The above individuals will arrive at the CPF at a time prescribed by the Warden.

16.4 Every effort will be made to limit the number of individuals at the CPF consistent with security needs.

16.5 All official witnesses, including news media representatives, will be escorted by the *Director, Office of Communications and Public Affairs*, to the CPF at least 15 minutes prior to the time of the scheduled execution. *Law enforcement witnesses as well as the Solicitor or his representative will be escorted by a Warden designated by the Institutional Division Director III. The victim's family members will be escorted by a representative of the Division of Victim Services. Family members of the inmate will be escorted by a staff member who will be designated by the Institutional Division Director III.*

16.6 The actual execution will be carried out as prescribed by specific procedures developed to supplement these procedures and included as Attachment #1. The procedures outlined in Attachment #1 will be approved by the *Institutional Division Director III* and by the Agency Director prior to being authorized for implementation. The Agency Director or an approved designee will be responsible for determining the SCDC officials who will be provided copies of the same.

16.7 If the method of death elected is lethal injection, the South Carolina Department of Corrections

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will comply with all state and federal requirements and statutes regarding the registration, dispensing, distribution, transportation, and administration of all controlled substances and equipment.

17. POST EXECUTION:

17.1 A Certificate of Execution will be prepared by the General Counsel to be signed by the executioner and by the attending physician immediately following the execution. The completed Certificate of Execution will be forwarded via certified mail (return receipt) by the General Counsel to the Clerk of Court of the county from which the condemned inmate was sentenced and to the Clerk of the South Carolina Supreme Court.

17.2 A Witness Certificate of Execution will be prepared by the General Counsel to be signed by all witnesses immediately following the execution. The completed certificate will be forwarded in the same manner as the Certificate of Execution described in Paragraph 17.1, above.

17.3 All controlled substances and bio-hazardous materials used to carry out the execution by lethal injection will be disposed of according to applicable state and federal regulations regarding controlled substances and equipment.

18. DISPOSITION OF BODY:

18.1 Autopsy - In compliance with Agency policy and state law, an autopsy will be performed on the deceased inmate. Necessary arrangements will be made in advance by the Director for Health Services.

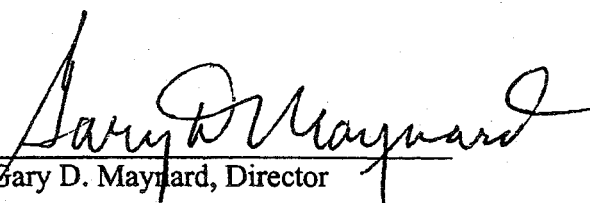
18.2 The Chief, Pastoral Care Services Branch, will contract with a local funeral home to (1) have the deceased inmate's body transported to a location designated by the Pathologist who is scheduled to perform the autopsy, and (2) ensure that the body is properly disposed of as prescribed by policy.

18.3 Upon completion of the autopsy, the deceased inmate's body may be released to a nearest relative as provided by state statute regarding Descent and Distribution. If the nearest relative refuses to claim the body, and if no other claim is made by relatives to the fifth degree of kinship, the body will be disposed of as are bodies of inmates who may die while in the custody of the South Carolina Department of Corrections. If the nearest relative desires that the body be transported to such person's former address in South Carolina, transportation expenses will be borne by the South Carolina Department of Corrections and a warrant will be drawn on the county Treasurer from which the deceased was sentenced. The Treasurer will then remit these expenses to the Department of Corrections and charge expense/cost to court expenses. If the body is transported outside the State of South Carolina, the cost will be at the relative's expense.

19. The Warden of the BRCI will ensure that Execution Team members *participate in* stress-trauma debriefing and counseling following the execution.

20. Within 30 days following the execution, the Warden, BRCI, will prepare and submit through appropriate channels to the Human Affairs Commission representative an after-action report of the execution.

21. Within statutory limitations, the Agency Director or his/her approved designee(s) reserves the right to modify these and any other Agency directives and procedures at any time to enhance the security and safety of the Agency, public, staff, and inmates. This includes, but is not limited to, terminating inmate visitation privileges on the date of an execution, adjusting employee work hours on the date of executions, etc. In addition, the Warden, BRCI, is granted the authority to make necessary internal operational and scheduling changes with the concurrence of the *Institutional Division Director III* to facilitate the safety and security of that particular institution on the date of a scheduled execution.

S/ 
Gary D. Maynard, Director

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SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE

ATTACHMENT #1

EXECUTION DAY		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
<p>1. Sponges and ammonia chloride solution will be prepared at direction of the Warden.</p>		<p>1. Phones will be checked. 2. Training drill for all personnel involved will be held if directed by the Warden. 3. Last meal will be ordered and will be served. 4. The inmate will be allowed a shower/change of clothes.</p>
	<p><u>At Least 9:00 Prior to Execution</u> Associate Warden or other persons authorized in the Controlled Substance Disposition Procedures will transport the lethal injection chemicals directly to the CPF Medical Room.</p>	
<p><u>At Least 1:15 Prior to Execution</u> 1. An Execution Team member will supervise the shaving of the inmate's head with electric clippers and a safety razor, the shaving of the right leg of inmate from the knee to ankle, and the showering of the inmate. 2. The Electricians will report to Execution Chamber for electrical preparation.</p>	<p><u>At Least 1:15 Prior to Execution</u> EMT/PA will mix lethal injection chemical according to Controlled Substance Disposition Procedures and carry chemical and supplies to the Executioner's room.</p>	<p><u>At Least 1:15 Prior to Execution</u> 1. Phone in Execution Chamber will be checked by the Warden/designee and Intercom turned on. 2. The inmate will be asked if s/he desires an injection of Valium. If the inmate requests the Valium, a 10 milligram intramuscular injection will be administered.</p>
<p><u>At Least :45 Prior to Execution</u> 1. Execution Team will report to CPF and final check will be made of equipment and associated paraphernalia. 2. After showering, the inmate will be returned to his/her cell in the CPF and given clean clothes, which have the right trouser leg cut off at the knee.</p>	<p><u>At Least :30 Prior to Execution</u> Execution Team will report to CPF and final check will be made of equipment and associated paraphernalia.</p>	

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
		<p><u>At Least :15 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. Witness Room curtain remains closed. 2. Witnesses enter the Witness Room.
<p><u>At Least :10 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. The Execution Team will enter the inmate's cell and the inmate will be restrained. 2. The inmate will be escorted to the Execution Chamber and restrained in the chair. 3. An Execution Team Member will apply conducting gel to the calf of the inmate's right leg and the crown of the inmate's head. 4. Copper anklet and electrodes will be attached to the right leg by the Electrician. 5. The Electrician will place the copper headpiece and sponge on the condemned inmate's head and secure them. 6. Electrodes will be attached to the headpiece by the Electrician. 7. The Witness Room Curtain will be opened. 8. The Electrician will place head restraint and hood over the inmate's head. 9. The Electrician will move to the equipment room and engage the circuit breaker. 	<p><u>At Least: 10 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. The Execution Team will enter the inmate's cell and the inmate will be restrained. 2. The inmate will be escorted to the preparation room and restrained to the table. 3. The inmate will be moved from the preparation room to the Execution Chamber and additional restraints will be applied and adjusted for the execution process. 4. Once the EMT/PA's have completed the IV and heart monitor setup and returned to the Executioner's Room, the Execution Team members will move to the rear of the back curtain and will remain on standby. The Warden will order the Witness Room window curtain to be opened by a designated team member. 	

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY (Continued)		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. Upon confirmation from the electricians that the circuit breaker has been engaged, the Warden will give the signal to the executioners to engage switches and the automatic cycle will begin. 2. Once the cycle runs its course, the Electrician will indicate the machine is off and disengage the manual circuit breaker in the equipment room. 3. The Electrician will then enter the Execution Chamber, disconnect the electrodes from the inmate, and inform the Warden that it is safe for the EMT to examine the inmate. 	<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. The designated Executioners will begin the rapid flow of lethal chemicals in the following order: <ol style="list-style-type: none"> a. Pentothal (Thiopental) 2 grams (GM); b. Pavulon (Pancurium Bromide) 50 milligrams (MG); c. Potassium Chloride/150 milliequivalents (MEQ). 2. The designated team member keeping time will start a stopwatch once the lethal chemicals have been injected. If the heart monitor does not indicate a flat line reading within ten (10) minutes, then a second set of lethal chemicals will be administered (Pavulon and Potassium Chloride only). The timekeeper will restart the stopwatch after the second set of chemicals are administered. This process will continue until the physician determines that death has occurred. The team members designated to administer chemicals will remain in place until death has been determined and the front curtain is closed. 3. The EMT/PA will observe the heart monitor and signal the physician indicating a flat line reading. 	<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. If there is a final statement, the Warden will turn on the intercom and the inmate's attorney of record will read the final statement to the official witnesses. 2. The Warden will make a final check with the Director for any stays or commutations. 3. If there are no stays or commutations, the Warden will signal that the execution will proceed.

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY (Continued)		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
		<ol style="list-style-type: none"> 1. The physician will determine that death has occurred and will advise the Warden. The Warden will announce the time of death. 2. The Warden will advise that the sentence of the Court has been carried out, and he will ask the witnesses to exit the Witness Room and sign the Execution Certificate in the Witness Waiting Room. 3. The inmate's body will be removed from the chair (for electrocution) or from the execution gurney (for lethal injection) and will be placed on the funeral home gurney. 4. The Warden and the attending Physician will sign the Execution Certificate.

2-27-04; 3:32PM; General Counsel

1803 8961766

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RESTRICTED

SOUTH CAROLINA DEPARTMENT OF CORRECTIONS

MEMORANDUM

TO: See Distribution List
FROM: Mr. Gary D. Maynard, Director
SUBJECT: Change 1 to SK-22.03, "Execution Directives," dated May 1, 2002
DATE: September 6, 2002

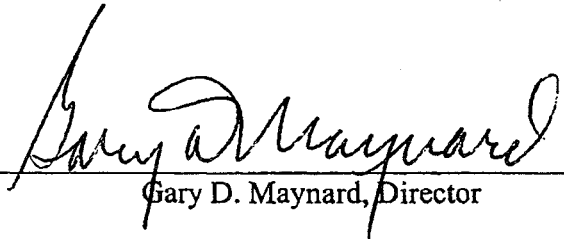
This change is effective immediately.

Page 2 and 3, Paragraph 4.2., is amended as follows:

4.2 Prior to the inmate being moved to the CPF, his/her personal property will be inventoried, recorded, and secured in the Lieber or Women's Correctional Institution Property Control Room for disposition in accordance with the inmate's written instructions. *In addition, a body cavity search will be conducted by medical personnel.* A packet containing the original copies of all documents *completed/written* by the inmate since receipt of the Execution Order, i.e., funeral arrangement documents, property disposition forms, etc., will be hand-carried to the Warden, BRCI. The inmate will be taken to the BRCI Identification Section by a BRCI Associate Warden, Major, or Captain and at least two (2) assistants, one (1) of whom will be of the same sex as the inmate. At that time, the inmate will be photographed and fingerprinted, and a positive identification will be made. The inmate will then receive a physical examination, and a body cavity search will be conducted by medical personnel. The inmate will be briefed by the Warden on procedures while in the CPF. *The inmate's* legal counsel may be present during these proceedings if requested by the inmate. An attorney from the SCDC Office of General Counsel will read the execution order to the inmate after arrival at the CPF prior to the execution.

Policy Holders should make the above changes to the policy/procedure and place this memo immediately in front of SCDC Policy/Procedure SK-22.03.

Questions regarding this change should be directed to the Institutional Division Director III.

SI 
Gary D. Maynard, Director

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**Page 2, Change 1 to SK-22.03
September 6, 2002**

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RESTRICTED

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA
COLUMBIA DIVISION

Luke A. Williams, III,)	
SCDC #SK-4874,)	Civil Action No. 3:08-00655-CMC
)	
Plaintiff,)	
)	
v.)	
)	AFFIDAVIT OF ROBERT E. WARD
Jon Ozmint, Director, South Carolina)	
Department of Corrections, in his)	
Individual and official capacities,)	
)	
Defendants.)	
_____)	

PERSONALLY APPEARED BEFORE ME, ROBERT E. WARD, who being duly sworn,
deposes and states:

1. I am currently employed by the South Carolina Department of Corrections (SCDC) as the Director of the Division of Operations.

2. I have personal knowledge regarding the process by which Director Jon Ozmint and the South Carolina Department of Corrections carry out the executions of inmates condemned to death by lethal injection. My responsibilities include overseeing the execution process and the selection of persons -- both SCDC employees and civilian medical personnel -- who carry out the executions.

3. The execution procedures and protocol are set forth in SCDC Policy No. SK-22.03 entitled "Execution Procedures." The sections of SCDC Policy No. SK-22.03 that address

the training, procedures and protocols adopted for carrying out an execution by lethal injection are Sections 15, 16, and 17 and Attachment #1. A true and accurate copy of Sections 15, 16, and 17 of SCDC Policy No. SK-22.03 and Attachment #1 are attached hereto as Exhibit A.

4. The execution procedures and protocol as set forth in SCDC Policy No. SK-22.03 will be utilized to carry out the execution by lethal injection of Luke A. Williams, III, which has been scheduled by the South Carolina Supreme Court to take place on February 20, 2009.

5. As required by S.C. Code Ann. § 24-3-530(A), Luke A. Williams, III has made an election to be executed by lethal injection. A true and accurate copy of Inmate Williams' election is attached hereto as Exhibit B.

6. The Execution Team for the execution of Luke A. Williams, III will include the Warden of Broad River Correctional Institution and several SCDC employees, two of whom will serve the role of executioner. The qualifications and training background, including prior experience in carrying out executions, are set forth below. As permitted by the Court and to protect the identities of the persons involved in the execution process for safety and security reasons, the names of the individuals are not listed.

A. Executioners

Executioner #1

- * Associates Degree in Criminal Justice
- * Worked in corrections in excess of 25 years
- * Worked at SCDC in excess of 25 years
- * Holds management level position at SCDC
- * Training in carrying out executions:
two training sessions and eight walk throughs
- * Participated in 9 prior executions by lethal injection
and 2 prior executions by electrocution

Executioner #2

- * Bachelors Degree

- * Worked in corrections in excess of 20 years
- * Worked at SCDC in excess of 20 years
- * Holds management level position at SCDC
- * Training in carrying out executions:
30 walk throughs
- * Participated in 23 prior executions by lethal injection
and 1 prior execution by electrocution

B. Warden

- * Bachelors Degree
- * Worked in corrections in excess of 25 years
- * Worked at SCDC in excess of 25 years
- * Holds management level position at SCDC
- * Training in carrying out executions:
17 training sessions including 51 walk throughs
- * Participated in 3 prior executions by lethal injection
and 1 prior execution by electrocution

C. Team Members

Participant #1

- * Bachelors Degree
- * Worked in corrections in excess of 10 years
- * Worked at SCDC in excess of 10 years
- * Holds management level position at SCDC
- * Training in carrying out executions:
3 training sessions including 9 walk throughs
- * Participated in 1 prior execution by lethal injection

Participant #2

- * Bachelors Degree
- * Worked in corrections in excess of 15 years
- * Worked at SCDC in excess of 15 years
- * Holds management level position at SCDC
- * Training in carrying out executions:
17 training sessions including 51 walk throughs
- * Participated in 3 prior executions by lethal injection
and 1 prior execution by electrocution

Participant #3

- * Worked in corrections in excess of 20 years
- * Worked at SCDC in excess of 20 years

- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
10 training sessions including 30 walk throughs
- * Participated in 2 prior executions by lethal injection
and 1 prior execution by electrocution

Participant #4

- * Bachelors Degree
- * Worked in corrections in excess of 25 years
- * Worked at SCDC in excess of 25 years
- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
48 training sessions including 144 walk throughs
- * Participated in 12 prior executions by lethal injection
and 2 prior executions by electrocution

Participant #5

- * Bachelors Degree
- * Worked in corrections in excess of 5 years
- * Worked at SCDC in excess of 5 years
- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
21 training sessions including 63 walk throughs
- * Participated in 4 prior executions by lethal injection
and 1 prior execution by electrocution

Participant #6

- * Worked in corrections in excess of 20 years
- * Worked at SCDC in excess of 20 years
- * Holds management level position at SCDC
- * Training in carrying out executions:
17 training sessions including 51 walk throughs
- * Participated in 3 prior executions by lethal injection
and 1 prior execution by electrocution

Participant #7

- * Bachelors Degree
- * Worked in corrections in excess of 15 years
- * Worked at SCDC in excess of 15 years
- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
10 training sessions including 30 walk throughs

- * Participated in 2 prior executions by lethal injection and 1 prior execution by electrocution

Participant #8

- * Worked in corrections in excess of 10 years
- * Worked at SCDC in excess of 10 years
- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
17 training sessions including 51 walk throughs
- * Participated in 3 prior executions by lethal injection and 1 prior execution by electrocution

Participant #9

- * Associates Degree
- * Worked in corrections in excess of 25 years
- * Worked at SCDC in excess of 25 years
- * Holds management level position at SCDC
- * Training in carrying out executions:
approximately 150 training sessions
- * Participated in 27 prior executions by lethal injection and 5 prior executions by electrocution

Participant #10

- * Worked in corrections in excess of 10 years
- * Worked at SCDC in excess of 10 years
- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
10 training sessions including 30 walk throughs
- * Participated in 2 prior executions by lethal injection and 1 prior execution by electrocution

Participant #11

- * Bachelors Degree
- * Worked in corrections in excess of 10 years
- * Worked at SCDC in excess of 10 years
- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
10 training sessions including 30 walk throughs
- * Participated in 2 prior executions by lethal injection and 1 prior execution by electrocution

Participant #12

- * Worked in corrections in excess of 20 years
- * Worked at SCDC in excess of 20 years
- * Holds supervisory level position at SCDC
- * Training in carrying out executions:
45 training sessions including 133 walk throughs
- * Participated in 11 prior executions by lethal injection
and 2 prior executions by electrocution

7. The Execution Team also includes medical personnel who are not SCDC employees. The Execution Team for the execution of Luke A. Williams, III will include a physician and two medical technicians, whose qualifications and training background, including prior experience in carrying out executions, are set forth below. The below information includes three medical technicians. The individual identified as Med Tech #1 participates in each execution by lethal injection. Either Med Tech #2 or Med Tech #3 will also participate in the execution of Inmate Williams. As permitted by the Court and to protect the identities of the persons involved in the execution process for safety and security reasons, the names of the individuals are not listed. If I were required to disclose the identities of these persons, I feel certain that they would no longer agree to assist the State with any future executions, and as a result, I would not have these experienced persons at my disposal. In addition, I believe that it will be very difficult to find medical personnel as substitutes for these individuals.

A. Physician

- * Graduate of Medical School
- * Practicing medicine in excess of 10 years
- * Licensed to practice medicine in South Carolina
- * Board certified in Emergency Medicine
- * Participated in five prior executions by lethal injection

B. EMT/Med Tech

Med Tech #1

- * Associates Degree
- * Certified Paramedic
- * Worked as EMT or Paramedic for in excess of 20 years
- * Experience siting/inserting IV lines in excess of 20 years
- * Participated in 32 prior executions by lethal injection

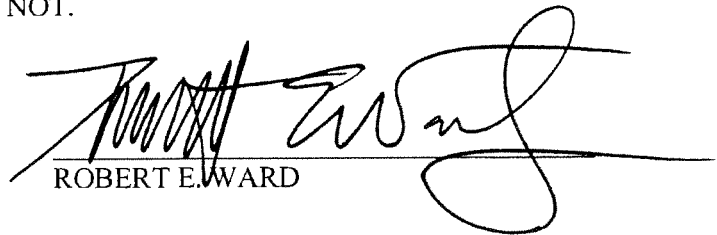
Med Tech #2

- * Associates Degree
- * Certified Paramedic
- * Worked as EMT or Paramedic for in excess of 10 years
- * Experience siting/inserting IV lines in excess of 10 years
- * Participated in 9 prior executions by lethal injection

Med Tech #3

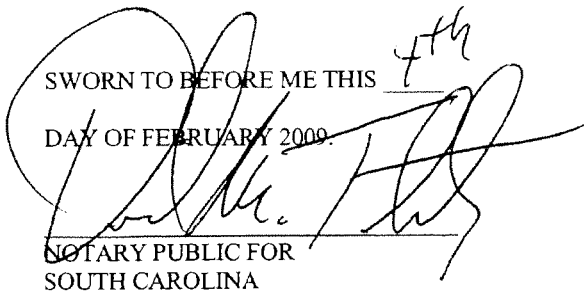
- * Certified Paramedic
- * Worked as EMT or Paramedic for in excess of 10 years
- * Experience siting/inserting IV lines in excess of 10 years
- * Participated in 2 prior executions by lethal injection

FURTHER, AFFIANT SAYETH NOT.



ROBERT E. WARD

SWORN TO BEFORE ME THIS 7th
 DAY OF FEBRUARY 2009.

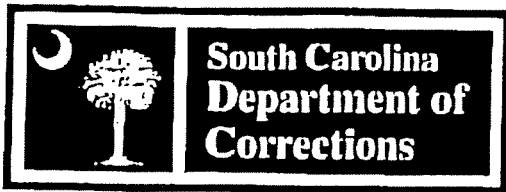


NOTARY PUBLIC FOR
 SOUTH CAROLINA

COMMISSION EXPIRES:

July 4 2013

Exhibit A



SK-22.03
Page 1

NUMBER: SK-22.03

TITLE: EXECUTION PROCEDURES

ISSUE DATE: June 1, 2008

RESPONSIBLE AUTHORITY: DIVISION OF OPERATIONS

OPERATIONS MANUAL: OPERATIONS

SUPERSEDES: SK-22.03 (May 1, 2002)

RELEVANT SCDC FORMS/SUPPLIES: NONE

ACA/CAC STANDARDS: NONE

STATE/FEDERAL STATUTES: Sections 24-3-510; 24-3-520; 24-3-530; 24-3-540; 24-3-550; 24-3-560; and 24-3-570, S.C. Code of Laws, 1976, as amended

PURPOSE: To provide general guidelines for the development of procedures to be followed prior to, during, and subsequent to an execution and from which more detailed and specific operational directives can be developed.

POLICY STATEMENT: As required by state law, the South Carolina Department of Corrections will conduct in a responsible, secure, and humane manner, the execution of inmates condemned to death. The South Carolina Department of Corrections will ensure the safety and security of the public and will have the absolute responsibility of providing for the security of those individuals awaiting execution.

Note: The Division Director of Operations may authorize a designee to carry out any of the duties and responsibilities assigned by this policy/procedure.

15. TRAINING AND PREPARATION FOR EXECUTION: It will be the responsibility of the Warden, BRCI, to train and prepare all SCDC Employees who participate in the actual carrying out of the death sentence. The number of training or practice sessions shall be set and scheduled by the Warden. Training sessions are not open to the news media or to any other persons not involved in carrying out the execution.

For executions by lethal injection, the Warden shall schedule a minimum of one training session during the week of a scheduled execution during which Execution Team members shall conduct a minimum of two mock executions following the protocol set forth in Attachment #1. At his/her discretion, the Warden may direct that additional training sessions be held during the week of a scheduled execution.

The Warden shall ensure at least one training session (including two mock executions) are conducted by the Execution Team each quarter (regardless of whether an execution takes place during that quarter), thereby ensuring that a minimum of four training sessions (and eight mock executions) are conducted annually.

On the date of a scheduled execution, the designated Executioners shall be given instruction by the EMT/PA's as to the proper use of the syringes used for administering the chemicals to ensure the proper flow and correct sequence of the chemicals is administered.

16. HEALTH SERVICES RESPONSIBILITIES:

16.1 Arranging for autopsy and notifying the coroner of pending execution;

16.2 Preparing the body removal permit;

16.3 Ensuring that the inmate's medical record is current and is prepared to accompany the body to the coroner's office;

16.4 Conducting a medical exam and body cavity search prior to the execution; and

16.5 At least seven (7) days prior to the inmate's arrival to BRCI, reviewing the medical record for possible history of drug abuse and conducting a physical examination to ascertain the condition of the inmate's veins at all potential IV sites; and advising the Warden of any abnormalities immediately and ensuring that the attending surgeon is briefed.

17. CARRYING OUT OF EXECUTION:

17.1 The hour the actual execution is to be carried out will be determined by the Agency Director.

17.2 If there is potential for disruption during the execution process by any witness or participant, the Warden may deny access to the individual(s). Should a disruption occur during the procedures, the responsible individual(s) may be removed.

17.3 The following individuals will be present in the CPF when the execution is carried out:

Physician	one (1)
Executioners	three (3) (if by electrocution), or two (2) (if by lethal injection)
*EMT or Physician's Assistant	two (2) (if by lethal injection), or none (if by electrocution)
Electricians	two (2) (one [1] of whom is an alternate) if execution is by electrocution
Warden	one (1)
Assistants to Warden	at least five (5) at the discretion of the Warden
**Religious Leader	one (1) (if requested by the condemned inmate)
**Attorney	one (1) (if requested by the condemned inmate)
Witnesses	<i>ten (10)</i> (as described in Procedure 9.1.1 through 9.1.6, above)
Official Non-SCDC Observer (Appointed by the Agency Director)	one (1)

* EMT/PA's shall be certified in their profession and shall have been certified for a minimum of one year. EMT/PA's shall possess experience in siting and inserting IV lines. At least one of the EMT/PA's will have participated in a prior execution.

** (The attorney must be an Attorney of Record or Legal Counsel approved by the Warden and requested by the inmate or Attorney of Record. However, the inmate may substitute one person from his immediate family for either his counsel or religious leader, or two persons from his immediate family for both his counsel and religious leader. For purposes of this item, 'immediate family' means those persons eighteen years of age or older who are related to the *inmate* by blood, adoption, or marriage. Questions about whether or not a proposed substitute is an immediate family member should

be addressed to the Office of General Counsel.)

The above individuals will arrive at the CPF at a time prescribed by the Warden.

17.4 Every effort will be made to limit the number of individuals at the CPF consistent with security needs.

17.5 All official witnesses, including news media representatives, will be escorted to the CPF prior to the time of the scheduled execution.

17.6 The actual execution will be carried out as prescribed by specific procedures developed to supplement these procedures and included as Attachment #1. The procedures outlined in Attachment #1 will be approved by the *Division Director of Operations* and by the Agency Director prior to being authorized for implementation. The Agency Director or an approved designee will be responsible for determining the SCDC officials who will be provided copies of the same.

17.7 If the method of death elected is lethal injection, the South Carolina Department of Corrections will comply with all state and federal requirements and statutes regarding the registration, dispensing, distribution, transportation, and administration of all controlled substances and equipment.

SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE

ATTACHMENT #1

EXECUTION DAY		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
		<ol style="list-style-type: none"> 1. Phones will be checked. 2. Training drill for all personnel involved will be held if directed by the Warden. 3. Last meal will be ordered and will be served. 4. The inmate will be allowed a shower/change of clothes.
	<p><u>At Least 9:00 Prior to Execution</u> Associate Warden or other persons authorized in the Controlled Substance Disposition Procedures will transport the lethal injection chemicals directly to the CPF Medical Room.</p>	
	<p><u>At Least 1:15 Prior to Execution</u> EMT/PA will mix lethal injection chemical according to manufacturers requirements and carry chemical and supplies to the Executioner's room.</p>	<p><u>At Least 1:15 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. Phone in Execution Chamber will be checked by the Warden/designee and Intercom turned on. 2. The inmate will be asked if s/he desires an injection of Ativan. If the inmate requests the Ativan, a 2 milligram intramuscular injection will be administered.
	<p><u>At Least :40 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. Execution Team will report to CPF and final check will be made of equipment and associated paraphernalia. 	

3:28-cv-06655-KMC Date Filed 02/20/09 Entry Number 23221 Page 82 of 139

SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE

ATTACHMENT #1

EXECUTION DAY		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
		<p><u>At Least :15 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. Witness Room curtain remains closed. 2. Witnesses enter the Witness Room.
	<ol style="list-style-type: none"> 2. The Execution Team will enter the inmate's cell and the inmate will be restrained. 3. The inmate will be escorted to the preparation room and restrained to the table. 4. The inmate will be moved from the preparation room to the Execution Chamber and additional restraints will be applied and adjusted for the execution process. <p><u>At Least :15 Prior to Execution</u></p> <ol style="list-style-type: none"> 1. The EMT/PA's will enter the Execution Chamber and run the IV lines to the inmate, site and insert one primary IV line and one secondary or back-up IV line in locations deemed appropriate by the EMT/PA's 2. The EMT/PA's shall connect the electrodes of the heart monitor to the inmate and ensure that the monitor is functioning properly. 3. A saline drip shall be started and observed by the EMT/PA's to ensure that the IV lines are functioning properly. 4. After the EMT/PA's have completed the IV and heart monitor setup and have returned to the Executioner's Room, the Execution Team members will exit the Execution Chamber and remain on standby. 5. The Warden will order the Witness Room 	

3:08-cv-06651-KAC Date Filed 02/20/09 Entry Number 23221 Page 83 of 139

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY		
	<p align="center">window curtain to be opened by a designated team member.</p>	

EXECUTION DAY (Continued)		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
	<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. The inmate shall be injected with the following sequence of chemicals: <ol style="list-style-type: none"> a. Pentothal (Thiopental) 3 grams (gm); b. Saline: 25 milligrams (mg) c. Pavulon (Pancuronium Bromide): 50 milligrams (mg) d. Saline: 25 milligrams (mg) e. Potassium Chloride: 240 milliequivalents (meq) f. Saline: 25 milligrams (mg) 2. Two sets of the chemicals set forth in item #1 above shall be prepared and immediately available to the Executioners for use. 3. At the direction of the Warden, the designated Executioners will begin the rapid flow of the chemicals set forth in item #1 in the stated sequence. The designated Executioners shall pause for a period of at least 90 seconds after 	<p><u>Time of Scheduled Execution</u></p> <ol style="list-style-type: none"> 1. If there is a final statement, the Warden will turn on the intercom and the inmate's attorney of record will read the final statement to the official witnesses. 2. The Warden will make a final check with the Director for any stays or commutations. 3. If there are no stays or commutations, the Warden will signal that the execution will proceed.

SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE

ATTACHMENT #1

EXECUTION DAY (Continued)		
	<p>administration of the Pentothal(Thiopental) before administering the Pavulon(Pancuronium Bromide). If it appears to the Warden that the inmate is not unconscious within 90 seconds after administration of the Pentothal(Thiopental), the Warden shall order that the secondary or back-up line be used to administer a second 3 gram dose of Pentothal (Thiopental) before the remaining sequence of chemicals is administered. If a second dose of Pentothal(Thiopental) is administered, the designated Executioners shall pause for a period of at least 60 seconds before administering the Pavulon(Pancuronium Bromide).</p> <p>4. During the administration of the chemicals, the Warden located within the Execution Chamber shall closely monitor the inmate for signs of any problems with the IV lines and for failure of the inmate to lose consciousness. If the Warden observes any problems with the primary IV line, he shall direct that the chemicals be administered using the secondary or back-up line.</p> <p>5. The designated team member keeping time will start a stopwatch once the chemicals have been injected. If the heart monitor does not indicate a flat line reading within ten (10) minutes, then a second set of chemicals shall be administered in the same sequence as set forth in item #1 above. The timekeeper will restart the stopwatch after the second set of chemicals are administered. This process will continue until the physician determines that death has occurred. The Warden may in his discretion order that the second set of chemicals be administered earlier than the ten minute mark.</p> <p>6. The EMT/PA's shall observe the administration of the chemicals by the Executioners to ensure</p>	

**SOUTH CAROLINA DEPARTMENT OF CORRECTIONS
EXECUTION SCHEDULE**

ATTACHMENT #1

EXECUTION DAY (Continued)		
	<p>that the chemicals are properly administered in the correct sequence and at the proper rate of flow and to ensure that the IV lines are properly functioning. Throughout the process, the EMT/PA's shall also observe the heart monitor and advise the physician when there is a flat line.</p> <p>7. The Execution Team members designated to administer the chemicals will remain in place until death has been determined and the witness curtain has been closed.</p>	

EXECUTION DAY (Continued)		
ELECTROCUTION	LETHAL INJECTION	BOTH METHODS MUST PROCESS
		<ol style="list-style-type: none"> 1. The physician will determine that death has occurred and will advise the Warden. The Warden will announce the time of death. 2. The Warden will advise that the sentence of the Court has been carried out, and he will ask the witnesses to exit the Witness Room and sign the Execution Certificate in the Witness Waiting Room. 3. The inmate's body will be removed from the chair (for electrocution) or from the execution gurney (for lethal injection) and will be placed on the funeral home gurney. 4. The Warden and the attending Physician will sign the Execution Certificate.

Exhibit B

RECEIVED

JAN 26 2009

STATE OF SOUTH CAROLINA)
COUNTY OF DORCHESTER)

NOTICE OF ELECTION

OPERATIONS

I, Luke A. Williams, III, SK4874, pursuant to Section 24-3-530, South Carolina Code of Laws, 1976 as amended, hereby elect lethal injection as the method for execution.

s/ Luke A. Williams III
Luke A. Williams, III, SK4874

Dated: 1/26/09

WITNESSES:

[Signature]
Mitchell Bodeman

EXHIBIT G



Inmate Request - General

Today's Date: 11/16/20 7:10

Name: MOORE, RICHARD BERNARD
Booking #: 006003
Permanent #: 006003

Reference #: 20-01756919
Date Requested: 11/10/20 21:19
Request Type: Security
Requested By: Kiosk

Request Details: E. Ramos. As you know, I am scheduled for execution on Dec. 4th of 2020. I have a right to choose one of two methods of execution, but cant because I have no info. of the protocol's. Could you please provide me the protocols for both, lethal ginjection and electrocution / electric chair. As always, thank you.

Disposition: Pending
Officer:
Disposition Date:



Inmate Request - General

Today's Date: 11/16/20 7:10

Name: MOORE, RICHARD BERNARD
Booking #: 006003
Permanent #: 006003

Reference #: 20-01757027
Date Requested: 11/11/20 00:40
Request Type: Security
Requested By: Kiosk

Request Details: Warden M. Stephan, as you know I am scheduled for execution on Dec. 4 of 2020 .I have a right to choose one of two methods of execution, but cant because I have no info. of the protocols. Could you please provide me the protocols for both, lethal injection and electrocution / electric chair. As always, thank you.

Disposition: Pending
Officer:
Disposition Date:



Inmate Request - General

Today's Date: 11/16/20 7:10

Name: MOORE, RICHARD BERNARD
Booking #: 006003
Permanent #: 006003

Reference #: 20-01757173
Date Requested: 11/11/20 08:20
Request Type: Security
Requested By: Kiosk

Request Details: Regional Dir. Willie Davis, as you know I am scheduled for execution on Dec. 4th of 2020. I have a right to choose one of two methods of execution, but cant because I have no info. of the protocols. Could you please provide me the protocols for both, lethal injection and electrocution / electric chair. As always, thank you.

Disposition: Pending
Officer:
Disposition Date:

EXHIBIT H

From: Lindsey S. Vann lindsey@justice360sc.org

Subject: Moore v. SCDC

Date: November 18, 2020 at 4:30 PM

To: daniel.plyler@smithrobinsonlaw.com, Hannah Freedman hannah@justice360sc.org, John H. Blume jb94@cornell.edu



Dear Daniel,

We received your response and the attached affidavit that indicated SCDC is willing to allow our team to review the protocols in "a confidential setting." Would you please let us know the parameters for the review and what restrictions "confidential" means in your interpretation? Please also let us know when and where we could review the protocols.

Thank you.

Best,

Lindsey S. Vann
Executive Director, Justice 360
900 Elmwood Avenue, Suite 200
Columbia, SC 29201
(803) 765-1044 (o)
(607) 592-3297 (c)



From: Daniel Plyler Daniel.Plyler@smithrobinsonlaw.com
Subject: Re: Moore v. SCDC
Date: November 18, 2020 at 7:39 PM
To: Lindsey S. Vann lindsey@justice360sc.org
Cc: Hannah Freedman hannah@justice360sc.org, John H. Blume jb94@cornell.edu, Salley Elliott Elliott.Salley@doc.sc.gov, Samuel Key Samuel.Key@smithrobinsonlaw.com, Austin Reed Austin.Reed@smithrobinsonlaw.com

Lindsey:

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1. At SCDC headquarters
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Sincerely,

Daniel C. Plyler

Sent from my iPhone

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Cc: Hannah Freedman hannah@justice360sc.org, John H. Blume jb94@cornell.edu, Salley Elliott Elliott.Salley@doc.sc.gov, Samuel Key Samuel.Key@smithrobinsonlaw.com, Austin Reed Austin.Reed@smithrobinsonlaw.com

Thank you for your response. Hannah Freedman and I are available to come to headquarters at 1 p.m. tomorrow if that works on your end.

Lindsey

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Executive Director, Justice 360
900 Elmwood Avenue, Suite 200
Columbia, SC 29201 | (803) 765-1044

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From: Daniel Plyler Daniel.Plyler@smithrobinsonlaw.com
Subject: RE: Moore v. SCDC
Date: November 19, 2020 at 9:13 AM
To: Lindsey S. Vann lindsey@justice360sc.org
Cc: Hannah Freedman hannah@justice360sc.org, John H. Blume jb94@cornell.edu, Salley Elliott Elliott.Salley@doc.sc.gov, Samuel Key Samuel.Key@smithrobinsonlaw.com, Austin Reed Austin.Reed@smithrobinsonlaw.com, Jonathan Eckstrom (C054560) Eckstrom.Jonathan@doc.sc.gov

Lindsey:

I have confirmed with SCDC that 1:00 pm works for them. The review will be at SCDC Headquarters located at 4444 Broad River Road, Columbia, SC 29210. You will have to go through the main gate, so please plan on arriving 15-20 minutes early. All attendees will need to have identification, and will need to wear a mask. When you arrive, park in the main parking lot and when you go inside to talk to the officer at the desk, ask for Salley Elliott or Jonathan Eckstrom. They will be able to assist you.

Sincerely,

Daniel C. Plyler



Daniel C. Plyler
Attorney at Law

E: daniel.plyler@smithrobinsonlaw.com Columbia Office
P: 803.254.5445 2530 Devine Street
C: 803.331.3328 Columbia, SC 29205
F: 803.254.5007

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From: Lindsey S. Vann <lindsey@justice360sc.org>
Sent: Wednesday, November 18, 2020 11:31 PM
To: Daniel Plyler <Daniel.Plyler@smithrobinsonlaw.com>
Cc: Hannah Freedman <hannah@justice360sc.org>; John H. Blume <jb94@cornell.edu>; Salley Elliott <Elliott.Salley@doc.sc.gov>; Samuel Key <Samuel.Key@smithrobinsonlaw.com>; Austin Reed <Austin.Reed@smithrobinsonlaw.com>
Subject: Re: Moore v. SCDC

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(607) 592-3297 (c)

From: Barton Vincent (C028988) Vincent.Barton@doc.sc.gov

Subject: FW: Moore v. SCDC

Date: November 19, 2020 at 9:20 AM

To: lindsey@justice360sc.org, hannah@justice360sc.org

Cc: Salley Elliott (C057924) Elliott.Salley@doc.sc.gov, Jonathan Eckstrom (C054560) Eckstrom.Jonathan@doc.sc.gov, Daniel Plyler Daniel.Plyler@smithrobinsonlaw.com

BV

Lindsey and Hannah:

1 p.m. today works for us to review the protocols. When you come to headquarters, come through the gate and park in the back of headquarters. We will let the gate know that you and Hannah are coming. You will need a face covering and ID. We will have a conference room available for you to review the information pursuant to Daniel's email below. You will also be able to meet with your client tomorrow (Friday) at 10:00 a.m. to satisfy the election requirements of 24-3-530.

Let me know if you have any questions.

Thanks

Barton J. Vincent
General Counsel
South Carolina Department of Corrections
4444 Broad River Road
Columbia, South Carolina 29221-1787
(803) 896-8508
Vincent.barton@doc.sc.gov

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From: Salley Elliott (C057924)

Sent: Thursday, November 19, 2020 8:33 AM

To: Barton Vincent (C028988) <Vincent.Barton@doc.sc.gov>

Subject: Fwd: Moore v. SCDC

Can you respond to Lindsey?

Sent from my iPhone

Begin forwarded message:

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Date: November 18, 2020 at 11:30:51 PM EST
To: Daniel Plyler <Daniel.Plyler@smithrobinsonlaw.com>
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Subject: Re: Moore v. SCDC

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(607) 592-3297 (c)

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Subject: FW: FW: Moore v. SCDC
Date: November 19, 2020 at 12:19 PM
To: lindsey@justice360sc.org, hannah@justice360sc.org



We thought it was appropriate to provide you with the attached confidentiality agreement. We believe it captures the below parameters set out by Mr. Plyler.

Thanks

Barton J. Vincent
General Counsel
South Carolina Department of Corrections
4444 Broad River Road
Columbia, South Carolina 29221-1787
(803) 896-8508
Vincent.barton@doc.sc.gov

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Columbia, SC 29201 | (803) 765-1044

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Let me know if you have any questions.

Thanks

Barton J. Vincent
General Counsel
South Carolina Department of Corrections
4444 Broad River Road
Columbia, South Carolina 29221-1787
(803) 896-8508
Vincent.barton@doc.sc.gov

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Sent: Thursday, November 19, 2020 8:33 AM
To: Barton Vincent (C028988) <Vincent.Barton@doc.sc.gov>
Subject: Fwd: Moore v. SCDC

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Sent from my iPhone

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900 Elmwood Avenue, Suite 200
Columbia, SC 29201
(803) 765-1044 (o)
(607) 592-3297 (c)



Confidentiality
Agree...C.docx

From: Hannah Freedman hannah@justice360sc.org
Subject: Re: Moore v. SCDC
Date: November 19, 2020 at 12:32 PM
To: Barton Vincent (C028988) Vincent.Barton@doc.sc.gov
Cc: Lindsey S. Vann lindsey@justice360sc.org

HF

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BV

Thank you for letting us know.

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<Confidentiality Agreement for SCDC.docx>

From: Lindsey S. Vann lindsey@justice360sc.org
Subject: Re: FW: FW: Moore v. SCDC
Date: November 19, 2020 at 1:21 PM
To: Barton Vincent (C028988) Vincent.Barton@doc.sc.gov
Cc: hannah@justice360sc.org



Upon review of the agreement you sent over, we will not be coming for the 1 p.m. protocol review.

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From: Daniel Plyler Daniel.Plyler@smithrobinsonlaw.com

Subject: Execution Protocol Review

Date: November 19, 2020 at 1:56 PM

To: Lindsey S. Vann lindsey@justice360sc.org, Hannah Freedman hannah@justice360sc.org

Cc: Barton Vincent (C028988) Vincent.Barton@doc.sc.gov, Salley Elliott (C057924) Elliott.Salley@doc.sc.gov, Austin Reed Austin.Reed@smithrobinsonlaw.com, Samuel Key Samuel.Key@smithrobinsonlaw.com, Melissa Segear Melissa.Segear@smithrobinsonlaw.com

Dear Lindsey and Hannah:

Bart Vincent forwarded me your email stating you are not going to attend the previously scheduled 1:00 pm protocol review. It appears from your response to him that your change of position was related to the proposed Confidentiality Agreement that Mr. Vincent sent to you. You do not elaborate, in any way, as to what you oppose with regard to the proposed Agreement. From the beginning of this offer of review, SCDC made it clear they wanted it to be a confidential review, so I assume your change in position is not related to the fact that a formal, confidentiality agreement was presented to you.

Could you kindly elaborate on why you are now refusing this offer to review the execution protocols?

Thank you in advance.

Sincerely,

Daniel C. Plyler

SMITH ROBINSON
Forward thinking. Results driven.

Smith Robinson Haller DuBose and Morgan, LLC

www.SmithRobinsonLaw.com

Daniel C. Plyler

Attorney at Law

E: daniel.plyler@smithrobinsonlaw.com Columbia Office
P: 803.254.5445 2530 Devine Street
C: 803.331.3328 Columbia, SC 29205
F: 803.254.5007

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EXHIBIT I

CONFIDENTIALITY AGREEMENT

I, _____, hereby agree to be bound by the following Confidentiality Agreement, and fully understand that my participation into the review of the South Carolina Department of Corrections' (SCDC) execution protocols mandates that I hold information I receive and/or become party to in the strictest of confidences, and therefore I willingly agree to the following as a Reviewing Party to such information:

Recitals

1. I, _____, understand that the purpose of the review of the SCDC execution protocols is to gather sufficient information so I will be able to properly advise Richard Bernard Moore as he contemplates his decision on electing the method of execution to be used for his scheduled execution.

2. I recognize and acknowledge that SCDC has voiced security concerns relating to the dissemination of the information contained in the SCDC execution protocols, and that SCDC is willing to make a limited disclosure of said protocols to me, in order for me, as a member of Richard Bernard Moore's legal defense team, to accomplish the purposes set forth in paragraph 1 above. I, _____, understand and agree that I am being provided access to this sensitive information by SCDC, for the sole purpose of advising Richard Bernard Moore with regards to his election of execution method, and agree to hold the information I receive confidential and to only use said information to accomplish the purpose of advising Richard Bernard Moore on his election of method of execution, which I understand must be made by November 20, 2020.

4. As a result, I, _____, willingly and voluntarily agree to the following terms and conditions.

Terms of Disclosure

1. **Scope.**

All documents and/or other information, whether written, recorded, oral, or in electronic form, received and/or considered during the review of SCDC's execution protocols (hereinafter referred to as "Confidential Information") is deemed to be confidential and shall be subject to this Agreement.

2. **Protection of Confidential Information.**

a. **General Protections.** Confidential Information shall not be used or disclosed by the Receiving Parties or any other persons identified below for any purposes whatsoever other than advising Richard Bernard Moore as he makes his election of execution method.

b. **Limited Third Party Disclosures.** The Receiving Parties shall not disclose or permit the disclosure of any Confidential Information under the terms of this Agreement to any other person except to Richard Bernard Moore and/or other members of his legal defense team, and only for the purpose of advising Richard Bernard Moore as he makes his election of execution method, and only after said person or persons have also agreed to the terms of this Confidentiality Agreement.

c. **Control of Documents.** Receiving Parties recognize and agree that they will not be provided copies of SCDC's execution protocols, but will be allowed to make notes relating to the review of the execution protocols, but only for use in advising Richard Bernard Moore as he makes his election of execution methods. Under no circumstances will any notes made by a Receiving Party be shared with anyone other than Richard Bernard Moore and/or other members of Richard Bernard Moore's legal defense team, and only for the purposes of advising Richard Bernard Moore as he makes his election of execution method.

3. **Treatment on Conclusion of advising Richard Bernard Moore as he makes his election of execution method**

a. **Agreement Remains in Effect.** All provisions of this Agreement restricting the use of Confidential Information shall continue to be binding after Richard Bernard Moore makes his election of execution method.

4. **Breach of Agreement; Injunctive Relief.**

Receiving Parties agree that any breach of this Agreement by any Receiving Party will cause irreparable harm to SCDC, its employees, and any potential member of the execution team for the execution of Richard Bernard Moore, that cannot be adequately compensated with money damages. Accordingly, SCDC shall be entitled to injunctive relief to enforce this Agreement, in addition to damages and other available remedies, to include, but not be limited to, reasonable attorneys' fees. In the event SCDC is required to enforce the terms of this Agreement in order to remedy or prevent any breach of this Agreement, the Receiving Party shall, in addition to any other damages for which it is responsible hereunder, pay and reimburse to SCDC the reasonable attorneys' fees and costs of SCDC associated with such enforcement.

6. **Miscellaneous.**

This Agreement, and the rights and responsibilities hereunder:

(a) may be amended by a document signed by SCDC and Receiving Parties; (b) may not be assigned without the prior written consent of the other parties; and (c) may be executed in several counterparts. The failure of SCDC to seek a remedy for the breach of any portion of this Agreement shall not constitute a waiver of its right with respect to same or any subsequent breach. If any provisions of this Agreement shall be held unenforceable, such holding shall not affect the enforceability of any other provision of this Agreement.

7. Persons Bound.

This Agreement shall take effect when signed and shall be binding upon the Receiving Parties and/or their representatives.

I SO STIPULATE AND AGREE:

Dated: _____

Witnessed:

Dated: _____

EXHIBIT J

STATE OF SOUTH CAROLINA)
)
COUNTY OF RICHLAND)

NOTICE OF ELECTION

I, Richard Bernard Moore #6003, pursuant to Section 24-3-530, South Carolina Code of Laws, 1976 as amended, hereby elect electrocution as the method for execution.

S/ Refusing to sign
Richard Bernard Moore #6003

Dated: 11-20-20

WITNESSES:

Regional Director Title Plan
AW [Signature]

I can not make a selection at this time to Method because my attorney and I do not have information for the protocols. ~~by~~ not selecting does not mean I wave my right to select.

Richard B. Moore
11/20/2020

Jacqueline Murrell

JACQUELINE MURRELL
Notary Public
South Carolina
My Comm. Expires April 27, 2026

STATE OF SOUTH CAROLINA)
)
COUNTY OF RICHLAND)

NOTICE OF ELECTION

I, Richard Bernard Moore #6003, pursuant to Section 24-3-530, South Carolina Code of Laws, 1976 as amended, hereby elect lethal injection as the method for execution.

S/ Refuse to sign
Richard Bernard Moore #6003

Dated: 11-20-20

WITNESSES:

Regional Director Willie Ray

A/W [Signature]

I can not make a ~~soot~~ selection at this time to the method because my attorney and I do not have information for the protocols. By not selecting does not mean I ~~g~~ wave my right to select.

Richard B. Moore
11/20/2020

Jacqueline Murrell

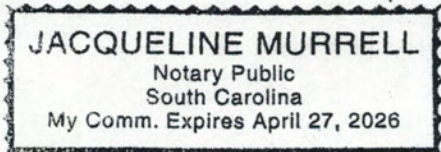


EXHIBIT K

The Supreme Court of South Carolina

Richard Bernard Moore, Petitioner,

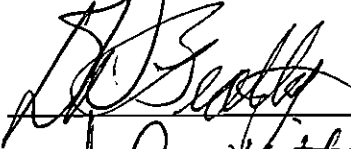

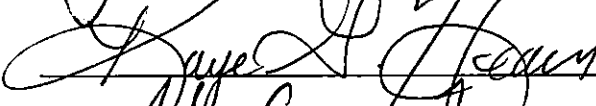

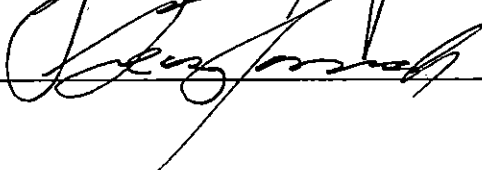
v.

Bryan P. Stirling, Director of the South Carolina
Department of Corrections, and South Carolina
Department of Corrections, Respondents.

Appellate Case No. 2020-001508

ORDER

Petitioner asks this Court, in our original jurisdiction, for a declaratory judgment, a writ of certiorari, or a writ of mandamus. The requests are denied.

	_____	C.J.
	_____	J.
	_____	J.
	_____	J.
	_____	J.

Columbia, South Carolina
November 20, 2020

cc:
Lindsey Sterling Vann, Esquire
Hannah Lyon Freedman, Esquire

John H. Blume, III, Esquire
Daniel Clifton Plyler, Esquire
Austin Tyler Reed, Esquire
Samuel Leonard Key, Esquire

EXHIBIT L

SMITH ROBINSON

Forward thinking. Results driven.

Smith Robinson Holler DuBose and Morgan, LLC

COLUMBIA 2530 Devine Street, Columbia, SC 29205
P: 803.254.5445 F: 803.254.5007

SUMTER 126 N. Main Street, Sumter, SC 29151
P: 803.778.2471 F: 803.778.1643

CAMDEN 935 Broad Street, Camden, SC 29020
P: 803.432.1992 F: 803.432.0784

Reply To: Daniel C. Plyler
Columbia Office
November 20, 2020

Via Email: lindsey@justice360sc.org

Lindsey S. Vann, Esquire
Executive Director, Justice 360
900 Elmwood Avenue, Suite 200
Columbia, SC 29201

RE: Richard Bernard Moore, SK # 6003

Dear Lindsey:

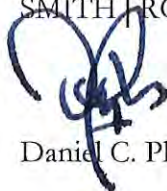
I have been informed by the South Carolina Department of Corrections (SCDC) that your client, Richard Bernard Moore, has refused to sign a Notice of Election form, and has affirmatively stated, in writing, that said refusal is not a waiver, in his opinion, under S.C. Code Ann. § 24-30-530. Additionally, on that same form, Mr. Moore states "I cannot make a selection at this time to method because my attorney and I do not have information for the protocols [sic]." As you know, SCDC made the execution protocols available for your review on November 19, 2020, but you refused to accept that offer and did not review the protocols at that time.

SCDC has authorized me to provide you the following information. SCDC's current lethal injection protocol is a three-drug protocol, which begins with an injection of Pentobarbital, followed at an appropriate time interval by Pavulon (Pancuronium Bromide), and then followed at an appropriate time interval by Potassium Chloride. A similar three-drug protocol utilized by the State of Kentucky, was found to be constitutional by the Supreme Court of the United States. *See Baze v Rees*, 553 U.S. 35, 128 S.Ct. 1520 (2008).

SCDC reserves the right to amend its lethal injection protocol, and if it is unable to secure sufficient quantities of each of the three drugs listed above, it is prepared to enact a one-drug protocol, which would consist of the use of Pentobarbital Sodium. As you know, a recent challenge to the constitutionality of the Pentobarbital Sodium single-drug protocol as utilized by the Federal Bureau of Prisons, was unsuccessful before the Supreme Court of the United States. *See Barr v. Lee*, 140 S.Ct. 2590 (2020).

Please advise Mr. Moore of this information.

Very truly yours,
SMITH ROBINSON



Daniel C. Plyler

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA**

Justice 360,

Plaintiff,

v.

Bryan P. Stirling, Director of the South Carolina
Department of Corrections; and Alan Wilson, South
Carolina Attorney General,

Defendants.

Civil Action No. 3:20-03671-MGL

DECLARATION OF W. BRADLEY WENDEL

I, W. Bradley Wendel, declare and state the following:

1. I am over 18 years old and competent to testify and give an opinion in this matter.

I have not received any compensation in connection with this opinion.

2. I have been asked by counsel at Justice 360, representing Richard Moore and other death-sentenced inmates, for an opinion concerning the ethical duties of lawyers representing clients faced with the choice among methods of execution. In my opinion, the refusal of the State to provide information about execution protocols for legal injection or electrocution imposes an intolerable burden on the ethical and effective representation of capitally sentenced inmates in South Carolina.

Qualifications

3. I am the Edwin H. Woodruff Professor of Law at Cornell Law School in Ithaca, New York. Prior to joining the Cornell faculty I was an Assistant and then Associate Professor of Law at Washington and Lee University, a law clerk to the Honorable Andrew J. Kleinfeld on the U.S. Court of Appeals for the Ninth Circuit in Fairbanks, Alaska, and a litigation associate at Bogle & Gates in Seattle, Washington. I am admitted to practice in New York and am on inactive status in Washington State, where I was initially admitted in 1994. I received a B.A. from Rice University, a J.D. from Duke Law School, and an LL.M. and J.S.D. from Columbia Law School. My qualifications are set out more fully in my CV, which is attached as an Exhibit to this Report.

4. My primary area of teaching and research specialization is legal ethics, professional responsibility, and the law governing lawyers. I am a co-editor of a widely adopted law school casebook, Hazard, Koniak, Cramton, Cohen & Wendel, *The Law and Ethics of Lawyering*, now in its Sixth Edition with Foundation Press; the sole author of a textbook, Wendel, *Professional Responsibility: Examples and Explanations*, also in its Sixth Edition, with Wolters Kluwer; and co-editor of an annually updated rules supplement, Martyn, Fox & Wendel, *The Law Governing Lawyers: National Rules, Standards, Statutes, and State Lawyer Codes*, also with Wolters Kluwer. In addition I have published numerous law review articles on these topics. I have regularly taught law school courses on legal ethics and professional responsibility for 20 years, frequently teach CLE programs on legal ethics for practicing lawyers throughout the country, and serve as a consultant or expert witness regarding legal ethics and professional responsibility nationwide. Since 2007, I have been a member of the drafting committee for the Multistate Professional Responsibility Examination (MPRE). In 2011 I served as a Reporter to a working group within the ABA Commission on Ethics 20/20, which considered amendments to the ABA Model Rules of

Professional Conduct. In 2012 I was the recipient of the Sanford D. Levy Memorial Award from the New York State Bar Committee on Professional Ethics.

5. A significant area of concentration for me within the field of legal ethics and professional responsibility pertains to the ethical duties of capital defense attorneys. I present ethics lectures regularly at continuing legal education programs for capital defense lawyers, including at annual National Habeas Corpus Seminars and National Seminars on the Development and Integration of Mitigation Evidence, both sponsored by the federal Office of Defender Services. Through the Cornell Death Penalty Project, I regularly advise capital defense attorneys around the country on legal ethics issues. I have served as an expert on the ethical responsibilities of capital defense attorneys in state and federal court across the country on numerous occasions, and have submitted affidavits, declarations, and reports on capital defense representation in federal and state courts nationwide. In addition to many other law review articles, specifically in the area of capital defense, I am the author of *Autonomy Isn't Everything: Some Cautionary Notes on McCoy v. Louisiana*, 9 St. Mary's Journal on Legal Malpractice & Ethics 82 (2018), which addresses exactly the issue that has arisen in this case; co-author, with John Blume, of an article on the impact of *Martinez v. Ryan* on the duties of attorneys, entitled *Coming to Grips with the Ethical Challenges for Capital Post-Conviction Representation Posed by Martinez v. Ryan*, 68 Florida L. Rev. 765 (2016); co-author, with Russell Stetler, of an article on the duty of reasonable care in capital defense representation, entitled *The ABA Guidelines and the Norms of Capital Defense Representation*, 41 Hofstra L. Rev. 635 (2013).

6. In preparing this Declaration I reviewed the Declaration of Lindsey S. Vann and the Complaint in this action.

Duties of Defense Counsel in Capital Cases

7. The ethical obligations of defense counsel in capital cases are restated in numerous sources, including the South Carolina Rules of Professional Conduct (“S.C. Rules”), the ABA Guidelines for the Appointment and Performance of Defense Counsel in Death Penalty Cases (2003) (“ABA Guidelines”),¹ the Restatement (Third) of the Law Governing Lawyers (“Restatement”), numerous court decisions applying the Sixth Amendment’s standards for effective assistance of counsel, and scholarship and commentary on legal ethics. It is a mistake to see these duties as having only one source, for example as arising only out of the rules of professional conduct or the Sixth Amendment. When lawyers consider, as they should, what is required by the highest standards of ethical representation, they should consider all of the sources that bear on their obligations.

8. The most fundamental obligation of any lawyer is to provide competent and diligent representation in the service of the best interests of the client. Specifically, at this late stage in the proceeding, defense counsel has the awesome and humbling responsibility of helping their clients decide how they will die. Richard Moore, Brad Sigmon, Freddie Owens, and other death-sentenced clients have the choice between two currently authorized methods of execution—lethal injection and electrocution—but under *Bucklew v. Precythe*, 139 S. Ct. 1112, 1128 (2019), they may also propose a less painful alternative. One of the last services provided by lawyers with Justice 360 may be counseling their clients about one of the most difficult decisions any human being could ever make.

9. When facing a decision of this magnitude, one might be expected to seek advice from family members, physicians, or members of the clergy, in addition to defense counsel.

¹ The ABA Guidelines are available at 31 Hofstra L. Rev. 913 (2003).

However, in order to decide in any meaningful way between the options provided by South Carolina Code § 24-3-530, a capital-sentenced inmate requires information about how, exactly, the state intends to implement the methods of lethal injection and electrocution. For example, when thinking about the alternative of lethal injection, it makes a great deal of difference which drugs are administered, in what doses, and in what order. As set forth in the Complaint, some drugs or combinations of drugs have caused agonizing deaths when used to execute inmates in other states. The suffering associated with this method of execution depends on the details of the drugs, as well as on the inmate's own medical history and condition. It also matters a great deal where the drugs are obtained, how their composition and purity is verified, and how they are transported and stored. Similarly, when considering electrocution, much depends on the details of the procedure. The magnitude, timing, and duration of the electric shocks significantly affect the suffering of an inmate being electrocuted. As in the case of lethal injection, the experience in other jurisdictions has been that electrocution can result in prolonged, agonizing death. In order to facilitate the deeply personal decision facing the inmate, someone must obtain information from the state about the details of the execution protocols. That person is most naturally defense counsel, who generally serves as the client's means of obtaining information from the state in order to provide meaningful legal advice.

10. In addition to generally being best suited to obtain the information their clients need to make decisions, defense counsel play a distinctive role. In many cases of this nature, the inmate has few others, if anyone, to turn to for counsel and support. Some inmates have good relationships with members of their family, while others do not. In other cases, family members are unavailable as counselors due to public health measures adopted by correctional institutions during the COVID-19 pandemic. But even where family members are part of the inmate's life in a meaningful

way, and able to meet personally with inmates, it is unrealistic to expect them to be able to provide expert assistance in dealing with complex legal issues arising at the end of life. The unique role of defense counsel is to establish a relationship of trust and confidence within which counseling about these important decisions is possible. Without understanding the execution protocols proposed by the state, however, defense counsel cannot provide meaningful assistance with the client's deliberations.

11. The commentary to Section 10.5 of the ABA Guidelines repeatedly emphasizes the importance of building trust and rapport with one's client. "Establishing a relationship of trust with the client is essential both to overcome the client's natural resistance to disclosing the often personal and painful facts necessary to present an effective penalty phase defense, and to ensure that the client will listen to counsel's advice on important matters such as whether to testify and the advisability of a plea." 31 Hofstra L. Rev. at 1008. The Guidelines talk about a long-term process of building trust – being available to talk to clients and counsel them about all aspects of their situation. *Id.* at 1010. Given the stakes involved in capital defense representation and the unique vulnerability of clients facing a possible death sentence, lawyers are expected to make an extraordinary effort to establish and maintain the confidence of their clients. All lawyer-client relationships are highly fiduciary, characterized by stringent duties of loyalty and care. However, the relationship between defense counsel and a capitally-sentenced inmate is the most sensitive one any lawyer can have with a client.

12. As Lindsey Vann, the attorney for Richard Moore, testified in her Declaration, her client has asked many questions concerning the choice between legal injection and electrocution. Not surprisingly, she reports that it is a source of stress for her client when she is unable to answer his questions. Vann Dec. ¶ 13. The State's refusal in this case to provide this information is

therefore putting pressure on the important and constitutionally protected relationship between Ms. Vann and her client. Cases involving the government's intrusion on the lawyer-client relationship often involve eavesdropping on, intercepting, or otherwise gaining access to confidential communications, disparaging defense counsel, or preventing clients from meeting with their lawyer. This caselaw shows that the lawyer-client relationship is of considerable constitutional significance. It is also of overriding *ethical* significance. Trust and confidence goes to the core of the value of the relation between an individual and their counsel.

13. Stated in terms of the South Carolina Rules of Professional Conduct, the most basic obligations of defense lawyers are to provide competent representation to a client (S.C. Rule 1.1), to reasonably consult with the client about the means by which the client's objectives are to be accomplished (S.C. Rule 1.4(a)(2)), and to explain a matter to the extent reasonably necessary to permit the client to make informed decisions regarding the representation (S.C. Rule 1.4(b)). The final decision here is for the client to make (S.C. Rule 1.2(a)). However, the lawyer is duty-bound to provide information that will enable the client to make an informed decision.

14. In addition to counseling their clients on choosing a method of dying, lawyers for Justice 360 must also use reasonable professional competence and skill (see Restatement § 16(2)) to determine whether to mount a challenge under the Eighth Amendment to the methods of execution made available by the State. Whether a method of execution constitutes cruel and unusual punishment that violates the Eighth Amendment depends critically on the details of the procedure—the type and dosage of drugs for lethal injection, the timing and magnitude of electrol shocks for electrocution, and so on. Under the rules of professional conduct, lawyers have an obligation to ensure that they have a good faith basis in law and fact for bringing a proceeding, or asserting a claim (S.C. Rule 3.1). And, of course, in federal court, lawyers are obligated by Fed.

R. Civ. P. 11(b)(3) to certify that “the factual contentions [in a filing] have evidentiary support.” Without adequate information about the details of the State’s execution protocols, lawyers for Justice 360 have no way of evaluating whether there is a good faith basis for challenging the methods of execution under the Eighth Amendment.

15. In sum, the State’s refusal to provide information, without justification, interferes with the ethical obligations of defense counsel. Imagine a hypothetical: The State hires a burglar to come into a lawyer’s office, steal all her books and client files, and disable her access to Westlaw and Lexis, the day before an important filing was due in the representation of Client A. Apart from the crime of burglary, that action would surely be understood as an attempt to interfere with the relationship between the lawyer and Client A by depriving the lawyer of information needed to provide competent representation.

Duties When Representing Clients with Diminished Decisionmaking Capacity

16. Ordinarily the South Carolina Rules of Professional Conduct allocate decisionmaking authority between the lawyer and client according to whether the decision pertains to the objectives of the representation or the means by which they are to be pursued (S.C. Rule 1.2(a)). A decision regarding objectives is for the client to make, and regarding means decisions, the lawyer and client should reasonably communicate about the action to be taken. Certain decisions are presumptively within the scope of objectives; in criminal cases these include whether to plead guilty, take the stand, and waive jury trial.

17. However, it is absolutely critical to understand that the usual allocation of decisionmaking authority presupposes a client with sufficient intellectual and emotional capacity to make decisions about important matters. Adequate decisionmaking capacity, for the purposes of the rules of professional conduct, is *not* equivalent to the constitutional competence standard,

as articulated in *Godinez v. Moran*, 509 U.S. 398 (1993). The *Godinez* standard is very low—requiring only sufficient ability to understand proceedings and consult with lawyer. Importantly, however, it is only the standard for what the court may do. For example, a court deciding whether to accept a waiver of an important procedural right from a client must determine whether the client is competent. But a defense lawyer has a different relationship with the defendant than the court does. The lawyer-client relationship is highly fiduciary in nature, and lawyers are subject to demanding duties of loyalty and care. They owe duties that are much more stringent than the minimal constitutional safeguards prescribed by the law of criminal procedure. The rules of professional conduct are intended to reinforce and clarify these fiduciary duties.

18. The relevant standard for a normal lawyer-client relationship is stated in S.C. Rule 1.14(a) as the client’s capacity to make “adequately considered decisions in connection with the representation.” This is elaborated in Comment [1] to the rule as “the ability to understand, deliberate upon, and reach conclusions about matters affecting the client’s own well-being.” Further clarification is provided by Restatement § 24 and comments to that section. Comment c notes that impairment of the client’s decisionmaking capacity may be the result of “childhood, old age, physical illness, retardation, chemical dependency, mental illness, or other factors.” The representation of clients with diminished capacity is a recurring problem for capital defense lawyers. The ABA Capital Defense Guidelines observe: “The prevalence of mental illness and impaired reasoning is so high in the capital defendant population that it must be assumed that the client is emotionally and intellectually impaired.” ABA Guidelines for the Appointment and Performance of Defense Counsel in Death Penalty Cases, Guideline 10.5, comment.

19. A lawyer representing a client with diminished decisionmaking capacity must be careful to treat the client with respect. S.C. Rule 1.14(a) says that “the lawyer shall, as far as reasonably possible, maintain a normal client-lawyer relationship with the client.” The Restatement contemplates that, in some situations, the lawyer may on occasion have no choice but to decide for an impaired client. It provides as follows: “A lawyer representing a client with diminished capacity . . . must . . . pursue *the lawyer’s reasonable view of the client’s objectives or interests* as the client would define them if able to make adequately considered decisions on the matter, even if the client expresses no wishes *or gives contrary instructions*.” Restatement § 24(2) (emphasis added). Importantly, the Restatement does not say that lawyers can substitute their judgment for that of their clients. It says, instead, that lawyers must attempt in good faith, to the best of their abilities, to figure out what the client would want – based on the client’s own interests and values—if the client were able to make adequately considered decisions.

20. The upshot of these rules is that, in the representation of clients with diminished capacity to participate in a meaningful way in the representation, defense counsel may have to assume greater responsibility for the quality of the client’s decision. Thus, lawyers’ own interest in obtaining information is implicated, along with their clients’ interest. To be clear, the ultimate decision is for the client to make, but where the client cannot meaningfully participate in the deliberation, the lawyer must necessarily assume additional responsibility.

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

Executed November 20, 2020 in Ithaca, New York.



W. Bradley Wendel

W. Bradley Wendel
Edwin H. Woodruff Professor of Law

108 Myron Taylor Hall
Cornell Law School
Ithaca, New York 14853

(607) 255-9719
Email: wbw9@cornell.edu
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EMPLOYMENT

Cornell Law School, Ithaca, New York.
Associate Dean for Academic Affairs, 2017-2020.
Professor of Law, 2006-2020.
Associate Professor of Law, 2004-06.

Regular Courses: Professional Responsibility; Torts; Advanced Torts; Products Liability.

Occasional Courses: Ethical Issues in Civil Litigation; Philosophical Perspectives on Legal Ethics (seminar); Ethics and Corporate Culture (co-taught behavioral ethics course for JD and MBA students); Jurisprudence/Philosophy of Law.

Washington and Lee University School of Law, Lexington, Virginia.
Associate Professor of Law, 2003-04.
Assistant Professor of Law, 1999-2003.

Columbia University School of Law, New York, New York.
Associate in Law, 1997-99.

U.S. Court of Appeals for the Ninth Circuit,
Honorable Andrew J. Kleinfeld, Fairbanks, Alaska.
Judicial Clerk, 1996-97.

Bogle & Gates, Seattle, Washington.
Product Liability Litigation Associate, 1994-96.

Admitted to practice in Washington State, 1994; New York, 2011.
Currently on active status in New York and inactive in Washington.

EDUCATION

Columbia University School of Law, New York, New York.
J.S.D. 2002, LL.M. 1998. Concentration: Legal Philosophy.
Advisors: Jeremy Waldron, Kent Greenawalt, Bill Sage

Duke University School of Law, Durham, North Carolina.
J.D. with Honors 1994.

W. Bradley Wendel
Page 2

Rice University, Houston, Texas.
B.A. in Philosophy 1991.

PUBLICATIONS

Books: As Author

Ethics and the Law: An Introduction (Cambridge University Press 2014).

Lawyers and Fidelity to Law. (Princeton University Press 2010).

Paperback edition published 2012; Chinese translation by Prof. Chao Yin published in 2013 by China Renmin University Press.

Professional Responsibility: Examples and Explanations. (Wolters Kluwer, 6th ed., 2019).

Books: As Editor

Torts: Cases and Materials (with Aaron Twerski and James A. Henderson, Jr.) (Wolters Kluwer, 5th ed. forthcoming 2020).

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Lawyers' Constrained Fiduciary Duties: A Comment on Paul R. Tremblay, At Your Service: Lawyer Discretion to Assist Clients in Unlawful Conduct, 70 Florida Law Review Forum 7 (2018), available at <http://www.floridalawreview.com/issue/volume-70/>.

Paying the Piper But Not Calling the Tune: Litigation Financing and Professional Independence – The Miller-Becker Professional Responsibility Distinguished Lecture, 52 Akron Law Review 1 (2018).

Economic Rationality and Ethical Values in Design-Defect Analysis: The Trolley Problem and Autonomous Vehicles, 55 California Western Law Review 129 (2018) (symposium, *Artificial Intelligence and Real-World Ethics*) [[SSRN Link](#)].

The Ordinary Heroism of Lawyers: A Tribute to Roger Cramton, 103 Cornell Law Review 1345 (2018) (mini-symposium in tribute to Roger Cramton).

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Role Morality, Dirty Hands, and the Theology of Vocation, in Marie Failing and Ronald W. Duty, eds., Lutheran Theology and Secular Law: The Work of the Modern State (Eerdmans 2018) [[Publisher's Link](#)].

Campaign Contributions and Risk-Avoidance Rules in Judicial Ethics, 67 DePaul Law Review 401 (2018) (Annual Clifford Symposium, *Dark Money and Judicial Elections*).

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Page 4

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Coming to Grips with the Ethical Challenges for Capital Post-Conviction Representation Posed by Martinez v. Ryan (with John H. Blume), 68 Florida Law Review 765 (2016). [[SSRN Link](#)]

Whose Truth? Objective and Subjective Perspectives on Truthfulness in Advocacy, 28 Yale Journal of Law and the Humanities 105 (2016). [[SSRN Link](#)]

Monroe Freedman: Ethicist of the Nonideal, 44 Hofstra Law Review 671 (2016) (tribute issue to Monroe H. Freedman).

Pushing the Boundaries of Informed Consent: Ethics in the Representation of Legally Sophisticated Clients, 47 University of Toledo Law Review 39 (2016) (symposium in tribute to Susan R. Martyn).

Nomos and Narrative in Law and Theological Ethics, in Marie A. Failing & Ronald W. Duty eds., On Secular Governance: Lutheran Perspectives on Contemporary Legal Issues (Eerdmans, 2016).

Radicalism and Realism in Legal Ethics, 17 Legal Ethics 313 (2014) (reviewing Robert K. Vischer, *Martin Luther King, Jr. and the Morality of Legal Practice: Lessons in Love and Justice*).

Foreword: The Profession's Monopoly and Its Core Values, 82 Fordham Law Review 2563 (2014) (annual ethics symposium, *The Legal Profession's Monopoly on the Practice of Law*).

W. Bradley Wendel
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In Search of Core Values, 16 Legal Ethics 350 (2014) (symposium on contemporary regulatory issues facing the American legal profession). [[SSRN Link](#)]

Alternative Litigation Finance and Anti-Commodification Norms, 62 DePaul Law Review 655 (2014) (19th Annual Clifford Symposium, *Tort Law and Social Policy, A Brave New World: The Changing Face of Litigation and Law Firm Finance*). [[SSRN Link](#)]

A Legal Ethics Perspective on Alternative Litigation Financing, 55 Canadian Business Law Journal 133 (2014) (symposium, *Commercial Litigation Funding: Ethical, Regulatory and Comparative Perspectives*). [[SSRN Link](#)]

Duty in the Litigation Investment Agreement: The Choice Between Tort and Contract Norms When the Deal Breaks Down, 66 Vanderbilt Law Review 1831 (2013) (symposium, *The Economics of Aggregate Litigation*) (with Anthony J. Sebok). [[SSRN Link](#)]

The ABA Guidelines and the Norms of Capital Defense Representation, 40 Hofstra Law Review 635 (2013) (symposium, *The ABA Guidelines for the Appointment and Performance of Defense Counsel in Death Penalty Cases*) (with Russell Stetler) [[SSRN Link](#)]

Articles on *Legal Ethics* and *Adversary System of Justice* in Hugh LaFollette, ed., The International Encyclopedia of Ethics (Wiley-Blackwell Publishing, 2013) [also [available online](#)].

Virtue and Vice in Legal Advising, 39 New England Journal on Criminal and Civil Confinement 25 (2013) (symposium on Michael Meltsner's *In Our Name: A Play of the Torture Years*).

The Rule of Law and Political Culture: Comparing the United States and New Zealand, 12 Otago Law Review 663 (2012). [[SSRN Link](#)]

Putting Morality in Its Place, 15 Legal Ethics 175 (2012) (response to reviews of Lawyers and Fidelity to Law by Russ Pearce, Eli Wald, and Trevor Farrow).

Legal Ethics is About the Law, Not Morality or Justice, 90 Texas Law Review 727 (2012) (response to reviews of Lawyers and Fidelity to Law by Tony Alfieri, Kate Kruse, David Luban, Steve Pepper, and Bill Simon). [[SSRN Link](#)]

Should Law Schools Teach Professional Duties, Professional Virtues, or Something Else: A Critique of the Carnegie Report, 9 University of St. Thomas Law Review 497 (2012) (symposium, *The Lawyer's Role and Professional Formation*). [[SSRN Link](#)]

Lawyering in the Christian Colony: Some Hauerwasian Themes, Reflections, and Questions, 75 Law and Contemporary Problems 1 (2012) (symposium, *Theological Argument in Law: Engaging Stanley Hauerwas*). [[SSRN Link](#)]

W. Bradley Wendel
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The Craft of Legal Interpretation, in Yasutomo Morigiwa, ed., Interpretation of Law in the Age of Enlightenment: From the Rule of the King to the Rule of Law (Springer 2011). [[SSRN Link](#)]

Three Concepts of Roles, 48 San Diego Law Review 547 (2011) (memorial symposium in honor of Fred Zacharias). [[SSRN Link](#)]

Explanation in Legal Scholarship: The Inferential Structure of Doctrinal Legal Analysis, 96 Cornell Law Review 1035 (2011). [[SSRN Link](#)]

Razian Authority and Its Implications for Legal Ethics, 13 Legal Ethics 191 (2010). [[SSRN Link](#)]

Legal Ethics and Moral Character, 23 Georgetown Journal of Legal Ethics 1065 (2010) (with Alice Woolley) (with a response by David Luban). [[SSRN Link](#).]

Methodology and Perspective in the Theory of Lawyers' Ethics: A Response to Professors Woolley and Markovits, 60 University of Toronto Law Journal 1011 (2010).

If Lifelong Learning is the Solution, What is the Problem?, 4 Canadian Legal Education Annual Review 45 (2010). [[SSRN Link](#).]

Legal Advising and the Rule of Law, in Kieran Tranter et al., eds., Reaffirming Legal Ethics: Taking Stock and New Ideas (Routledge 2010).

Personal Integrity and the Conflict Between Ordinary and Institutional Values, in Tim Dare and W. Bradley Wendel, eds., Legal Ethics: Professional Ethics and Personal Integrity (Cambridge Scholars Press 2010). [[SSRN Link](#).]

The Behavioral Psychology of Judicial Corruption: A Response to Judge Irvin and Daniel Real, 42 McGeorge Law Review 35 (2010).

The Torture Memos and the Demands of Legality, 12 Legal Ethics 107 (2009). [[SSRN Link](#).]

Government Lawyers, Democracy, and the Rule of Law, 77 Fordham Law Review 1333 (2009) (symposium, *The Lawyer's Role in a Contemporary Democracy*).

Executive Branch Lawyers in a Time of Terror, 31 Dalhousie Law Journal 247 (2009) (the 2008 F.W. Wickwire Memorial Lecture on Legal Ethics and Professional Responsibility). [[SSRN Link](#).]

Legal Ethics as "Political Moralism" or the Morality of Politics, 93 Cornell Law Review 1413 (2008) (reviewing David Luban, *Legal Ethics and Human Dignity*).

Impartiality in Judicial Ethics: A Jurisprudential Analysis, 22 Notre Dame Journal of Law, Ethics, and Public Policy 305 (2008) (symposium, *The Judiciary*).

W. Bradley Wendel
Page 7

Lanyers as Quasi-Public Actors, 45 Alberta Law Review 83 (2008) (symposium in honor of the 100th anniversary of the Law Society of Alberta). [[SSRN Link.](#)]

Moral Judgment and Professional Legitimation, 51 St. Louis University Law Review 1071 (2007) (symposium, *Teaching Legal Ethics*).

Lanyers, Citizens, and the Internal Point of View, 75 Fordham Law Review 1473 (2006) (symposium, *The Internal Point of View in Law and Ethics*). [[SSRN Link.](#)]

Institutional and Individual Justification in Legal Ethics: The Problem of Client Selection, 34 Hofstra Law Review 987 (2006) (symposium, *Lanyers' Ethics in an Adversary System*, in honor of Monroe Freedman). [[SSRN Link.](#)]

Ethical Lanyering in a Morally Dangerous World, 19 Georgetown Journal of Legal Ethics 299 (2006) (reviewing Milton C. Regan, Jr., *Eat What You Kill: The Fall of a Wall Street Lanyer*).

Articles on legal ethics issues in Paul Finkelman, ed., Encyclopedia of American Civil Liberties (New York: Routledge, 2006): *Bates v. State Bar of Arizona*, *Brotherhood of Railroad Trainmen v. Virginia ex rel. Virginia*, *Judicial Bias*, *Lawyer Advertising*, *Chicago Seven Trial*, *Disciplining Lanyers for Speaking About Pending Cases*, *Ineffective Assistance of Counsel*.

Legal Ethics and the Separation of Law and Morals, 91 Cornell Law Review 67 (2005). [[SSRN Link.](#)]

Professionalism as Interpretation, 99 Northwestern University Law Review 1169 (2005). [[SSRN Link.](#)]

Symposium Introduction, *Economic Rationality vs. Ethical Reasonableness: The Relevance of Law and Economics for Legal Ethics*, 8 Legal Ethics 107 (2005) (review symposium on Randal Graham, *Legal Ethics*).

Civil Obedience, 104 Columbia Law Review 363 (2004). [[SSRN Link.](#)]

The Banality of Evil and the First Amendment, 102 Michigan Law Review 1404 (2004) (reviewing Alexander Tsesis, *Destructive Messages: How Hate Speech Paves the Way for Harmful Social Movements*).

The Deep Structure of Conflicts of Interest, 16 Georgetown Journal of Legal Ethics 473 (2003) (reviewing Andrew Stark, *Conflicts of Interest in American Public Life* and Michael Davis & Andrew Stark, *Conflicts of Interest in the Professions*).

A Moderate Defense of Hate Speech Regulations on University Campuses, 41 Harvard Journal on Legislation 407 (2004) (symposium, *Perspectives on Hate Speech and Hate Crimes*).

Conflicts of Interest Under the Revised Model Rules, 81 Nebraska Law Review 1363 (2003) (symposium, *Nebraska and the Model Rules of Professional Conduct*).

W. Bradley Wendel
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Symposium Introduction, *Our Love-Hate Relationship with Heroic Lawyers*, 13 Widener Law Journal 1 (2003) (symposium, *When a Lawyer Stood Tall: Sharing and Understanding Stories of Lawyer Heroes*).

Informal Methods for Enhancing the Accountability of Lawyers, 54 South Carolina Law Review 979 (2003) and *How I Learned to Stop Worrying and Love Lawyer-Bashing: Some Post-Conference Reflections*, 54 South Carolina Law Review 1037 (2003) (symposium, *Enhancing the Accountability of Lawyers for Unprofessional Conduct*).

Regulation of Lawyers Without the Code, the Rules, or the Restatement: Or, What Do Honor and Shame Have to do with Civil Discovery Practice?, 71 Fordham Law Review 1567 (2003) (annual ethics symposium, *Looking Back*).

Busting the Professional Trust: A Comment on William Simon's Ladd Lecture, 30 Florida State University Law Review 659 (2003).

Mixed Signals: Rational-Choice Theories of Social Norms and the Pragmatics of Explanation, 77 Indiana Law Journal 1 (2002).

"Certain Fundamental Truths": A Dialectic on Negative and Positive Liberty in Hate-Speech Cases, 65 Law and Contemporary Problems 33 (2002) (symposium, *Enduring and Empowering: The Bill of Rights in the Third Millennium*).

Ethics for Skeptics, 26 Journal of the Legal Profession 165 (2002) ("mini-symposium" on the panel presentations at the 2002 meeting of the professional responsibility section of the AALS).

Teaching Ethics in an Atmosphere of Skepticism and Relativism, 36 University of San Francisco Law Review 711 (2002) (symposium, *Teaching Values in Law School*).

Nonlegal Regulation of the Legal Profession: Social Norms in Professional Communities, 54 Vanderbilt Law Review 1955 (2001).

Professional Roles and Moral Agency, 89 Georgetown Law Journal 667 (2001) (reviewing Arthur Isak Applbaum, *Ethics for Adversaries*).

The Ideology of Judging and the First Amendment in Judicial Election Campaigns, 43 South Texas Law Review 73 (2001) (annual ethics symposium, *The Ethics of Judicial Selection*).

Motivation, Morality, and the Professionalism Movement, 52 South Carolina Law Review 557 (2001) (symposium, *Improving the Professionalism of Lawyers: Can Commissions, Committees, and Centers Make a Difference?*).

Free Speech for Lawyers, 28 Hastings Constitutional Law Quarterly 305 (2001).

Value Pluralism in Legal Ethics, 78 Washington University Law Quarterly 113 (2000).

W. Bradley Wendel
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Public Values and Professional Responsibility, 75 Notre Dame Law Review 1 (1999).

Rediscovering Discovery Ethics, 79 Marquette Law Review 895 (1996).

Lawyers & Butlers: The "Remains" of Amoral Ethics, 9 Georgetown Journal of Legal Ethics 161 (1995).

Other Publications

Rule of Professional Conduct, or Speech Code, or Both? (reviewing Stephen Gillers, *A Rule to Forbid Bias and Harassment in Law Practice: A Guide for State Courts Considering Model 8.4(g)*, 30 Geo. J. Legal Ethics 195 (2017)). Jotwell – Legal Profession (Feb. 2019).

Professional Responsibility, in Robert Glicksman, et al., Stay Ahead of the Pack: Your Comprehensive Guide to the Upper Level Curriculum (West Publishing 2018).

Are There Ethical Pitfalls in the Use of Third-Party Litigation Financing?, The Advocate (State Bar of Texas Litigation Section), Fall 2017, pp. 51-55.

Making Sense of the Fee-Splitting Rule (reviewing Anthony J. Sebok, *Unmatured Attorneys' Fees and Capital Formation in Legal Markets*, U. Ill. L. Rev. (2018)). Jotwell – Legal Profession (Feb. 2018).

Legal Ethics After Liberalism (reviewing Allan C. Hutchinson, *Fighting Fair: Legal Ethics for an Adversarial Age* (2015)). Jotwell – Legal Profession (Feb. 2017).

Is the Crisis in the Profession Good for Consumers? (reviewing Ben Barton, Glass Half Full (2015)). Jotwell – Legal Profession (Feb. 2016).

Not Business as Usual for In-House Counsel (reviewing the Valukas report on the General Motors ignition switch recall). Jotwell – Legal Profession (Feb. 2015).

Defending Defending, with Integrity (reviewing Abbe Smith & Monroe H. Freedman, eds., How Can You Represent Those People? (2013)). Jotwell – Legal Profession (Feb. 2014).

Strategies and Techniques for Teaching Professional Responsibility (Wolters Kluwer 2012).

Anti-Avoidance Rules as an Argument for Inclusive Positivism: A Comment on John Prebble's Ectopia and Morality of Avoidance Claims. Presented at Victoria University-Wellington/Cornell Colloquium, "Jurisprudential Perspectives on Taxation Law."

Protection for Bad Work, New York Times "Room for Debate" feature on Torture and Academic Freedom (Aug. 20, 2009).

W. Bradley Wendel
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Deference to Clients and Obedience to Law: The Ethics of the Torture Lawyers (A Response to Professor Hatfield), Northwestern University Law Review “Colloquy” (online companion to Nw. U. L. Rev.) (Aug. 2, 2009).

Editorial, *The Methodology of Legal Ethics Scholarship: Perspective and Authority*, 9 Legal Ethics 229 (2007).

The Legalization of Legal Ethics: An Historical Perspective from the United States, 36 Dong-A University [South Korea] Law Review 269 (2005).

Editorial, *On International and Interdisciplinary Legal Ethics Scholarship*, 7 Legal Ethics 110 (2004).

Reason and Authority in Legal Ethics, American Philosophical Association Newsletter on Philosophy and Law (Spring 2003), at 171.

Hate and the Bar: Is the Hale Case McCarthyism Redux or a Victory for Racial Equality?, The Bar Examiner (May 2001), at 26. (This essay was the winner of the 2001 Joe E. Covington Prize for Scholarship in Bar Admissions Topics, awarded by the National Conference of Bar Examiners.)

SELECTED PRESENTATIONS

Public Lectures

“Paying the Piper But Not Calling the Tune,” *Joseph G. Miller and William C. Becker Center for Professional Responsibility Distinguished Lecture*, University of Akron Law School. Akron, Ohio, April 13, 2018.

“Lawyering in the Age of Trump,” *Thomas Feeney Annual Memorial Lecture*, University of Ottawa. Ottawa, Ontario, Canada, January 18, 2018.

“Ethics and Government Lawyering in the Age of Trump,” Lecture sponsored by the Burns Center for Ethics in the Practice of Law, Cardozo Law School. New York City, November 13, 2017.

“Ethical Duties of Government Legal Advisors,” *Public Lecture*. O.P. Jindal Global University. Delhi, India, April 7, 2017.

“How to Think About the Panama Papers,” *Rice University Program on Law, Politics, and Society*. Houston, Texas, October 20, 2016.

“Lawyers and Fidelity to Law – An Overview,” *David Weiner Center for Lawyers’ Ethics and Professional Responsibility – 23d Israel Legal Ethics Teachers’ Workshop*. COMAS Law School, Rishon LeZiyyon, Israel, May 19, 2013.

“The Ethics of Legal Advising,” Lecture in the *Murer Professionalism Series*. Northern Illinois University College of Law. DeKalb, Illinois, November 14, 2012.

W. Bradley Wendel
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“Adversarialism’ and the Obligations of Lawyers,” Keynote Address. *Australia/New Zealand Legal Ethics Colloquium [ANZLEC]: Is Adversarialism Dead? New Foundations for Legal Process and Lawyers’ Ethics*. Legal Issues Centre, University of Otago Faculty of Law. Dunedin, New Zealand. February 9, 2012.

“Regulatory Reform and Professional Independence,” *Shine Lecture on Law*. University of Southern Queensland, Toowoomba, Queensland, Australia. September 28, 2010.

“The Role of Lawyers in Corporate Governance,” Formal lecture pursuant to the H.R.H. Princess Bajrakitiyabha faculty exchange program. Bangkok, Thailand. November 7, 2008.

“Professional Responsibility for Government Lawyers,” *Dean’s Lecture on Professional Responsibility*. Yale Law School, New Haven, Connecticut. March 13, 2008.

“Lawyers in a Time of Terror,” *Wickwire Memorial Lecture in Legal Ethics and Professional Responsibility*. Dalhousie Law School, Halifax, Nova Scotia. February 21, 2008.

Lecture, “Law, Ethics, and Torture: The Roles of Government Attorneys and Lawyers Representing Detainees,” Florida Coastal School of Law, Jacksonville, Florida. March 8, 2007.

“The Legalization of Legal Ethics: An Historical Perspective from the United States,” Dong-A University Law School, Busan, South Korea. February 3, 2005.

Conference and Other Presentations

“The Regulatory Perspective and Systems Thinking in Legal Ethics,” 2020 Clarke Prize in Legal Ethics Conference: Organizational Clients, Risk, and Ethics. Gonzaga Law School. Spokane, Washington (via Zoom), April 16, 2020.

“Understanding the Complex Loyalty of Lawyers: Dual-Commission, Governance Mandate, and Intrinsic-Limit Analyses,” *International Fiduciary Law Conference*. Cambridge Private Law Centre – University of Cambridge Faculty of Law. Cambridge, United Kingdom, December 16-17, 2019.

Panelist, *The Future of Dispute Financing: Pricing, Profits, and Policy*, NYU Center on Civil Justice. New York, New York, October 18, 2019.

Commentator celebrating the publication of Lonnie T. Brown, Jr., *Defending the Public’s Enemy: The Journey of Ramsey Clark*. University of Georgia Law School. Athens, Georgia, October 3, 2019.

“Should Lawyers Be Loyal to Clients, the Law, or Both?” *Legal Ethics and Fiduciaries Workshop*. University of Notre Dame – Kylemore Abbey Global Centre. Connemara, County Galway, Ireland, June 20-21, 2019.

W. Bradley Wendel
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“Yoshimi Battles the Legal Robots,” *Lawyering in the Age of Artificial Intelligence*. University of Oklahoma Law Review Symposium. Norman, Oklahoma, February 8, 2019.

Panelist, “Defending Sexual Assault Cases”; Panelist, “Social Justice and Democracy: The Role of Lawyers”; Panelist, “The Duty of Confidentiality – A Comparative and Theoretical Perspective,” *Eighth International Legal Ethics Conference [ILEC 8]*. University of Melbourne Law School, Melbourne, Australia, December 6-8, 2018.

“Anti-Discrimination Norms and the Duty of Zealous Advocacy,” *#MeToo and the Legal Profession*. Jacob Burns Center for Ethics in the Practice of Law, Cardozo Law School. New York City, November 13, 2018.

“Continuing Duties of Trial Counsel in Post-Conviction Proceedings,” *2018 Western All-Star Conference and Confabulation*. Boise, Idaho, September 20, 2018.

“Fiduciary Theory and the Capabilities of Clients,” *Sixth Annual Fiduciary Law Workshop*. Washington University, St. Louis, Missouri, June 8-9, 2018.

“The Moral Agency of Clients and the Standard Conception of Legal Ethics,” *Australia/New Zealand Legal Ethics Colloquium [ANZLEC]*. Auckland, New Zealand, December 1-3, 2017.

“What Did Rod Rosenstein Do Wrong? The Rule of Law and Legal-Process Legal Ethics,” *Fourth Legal Ethics Schmooze*. UCLA Law School. Los Angeles, California, July 21-22, 2017.

“Does Deference to the President’s Policy Decisions Presuppose Commitment by the President to the Rule of Law?” *Realizing Rights 2017: Human Rights and Constitutionalism*. University of Ottawa. Ottawa, Ontario, June 8-10, 2017.

“Role Morality, Dirty Hands, and the Theology of Vocation,” *Council on Religion and Law (CORAL) Annual Meeting*. United Theological Seminary, Minneapolis, Minnesota, October 27-28, 2016.

“What’s Left to Say About Philosophical Legal Ethics?” *Southeast Association of Law Schools (SEALS) Annual Meeting*. Amelia Island, Florida, August 3-9, 2016.

“The Role of Fiduciary Duties in the American Law Governing Lawyers,” *International Legal Ethics Symposium – Tokyo (ILEST) 2016*. Tokyo, Japan, March 18-19, 2016.

“Crossing the Bridge,” *Workshop on Role Obligation*. University of Auckland Department of Philosophy. Auckland, New Zealand, January 3-6, 2016.

“The Ethics of Snitching,” *Third Legal Ethics Schmooze*. Stanford Law School. Palo Alto, California, June 25-26, 2015.

W. Bradley Wendel
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Member of Discussion Group, “Ethics in Juvenile Defense,” National Juvenile Defenders Association. Georgetown Law School, Washington, D.C. May 20, 2015.

Panelist, *Prosecutorial Discretion: A Conversation with Judge Kozinski*, Cornell Law School. February 6, 2014.

Panelist, “Government Lawyers: Advocates or Ethical Watchdogs?” *Professional Ethics in National Security Law and Policy*. University of Pennsylvania, Center for Ethics and the Rule of Law. Philadelphia, Pennsylvania, October 4, 2013.

“Lawyers and Fidelity to Facts,” *Second Legal Ethics Schmooze*. Fordham Law School. New York, New York, June 17-19, 2013.

“Rights and Obligations in Alternative Litigation Financing” and “Ethical Issues in Alternative Litigation Financing,” *The Economics of Aggregate Litigation*, Institute for Law and Economic Policy (ILEP), 19th Annual Symposium. Naples, Florida, April 11-12, 2013.

Participant, *Ethics from Every Angle*, conference at University of New Hampshire Law School. Concord, New Hampshire, April 5, 2013.

Below the Line, podcast comments on Carol Rice Andrews, “Ethical Limits on Civil Litigation Advocacy: A Historical Perspective,” 63 Case W. Res. L. Rev. vol. 2 (2012).

“Political Cultures and Attitudes in Legal Ethics” and “Ethical Obligations and the Organization: Is There a Difference in the Fundamental Ethical Obligations Depending Upon the Nature of the Client? (Roundtable),” *Fifth International Legal Ethics Conference [ILEC V]*. Banff, Alberta, Canada. July 12-14, 2012.

Panelist, “The Ethics of Legislative Drafting,” *Canadian Institute for the Administration of Justice Drafting Conference*. Ottawa, Canada. September 13, 2010.

“The Global Law Firm: Relationships of Trust and Regulation of the Legal Profession in the 21st Century”; “A Modern Legal Ethics: Author Meets Critics”; “Comparative Judicial Ethics”; “Jurisprudence and Legal Ethics”. *Fourth International Legal Ethics Conference [ILEC IV]*. Stanford Law School. Palo Alto, California. July 16-17, 2010.

“Legal Ethics: Public or Personal?”, *International Legal Ethics Seminar*. Aksaray, Turkey. July 1, 2010. “Guantanamo and the Rule of Law,” *International Legal Ethics Conference: Challenges to the Legal Profession in the U.S., Europe, and Turkey*. Ankara, Turkey. June 29, 2010.

Commentator and Panelist, “A Conversation About Ethical, Social, and Moral Issues Related to Alternative Litigation Finance,” *Alternative Litigation Finance in the U.S.: Where Are We and Where Are We Headed with Practice and Policy?* RAND Institute for Civil Justice Conference. Arlington, Virginia, May 20-21, 2010.

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“The Ethical Judge,” *Judicial Ethics and Accountability: At Home and Abroad*. Symposium sponsored by University of the Pacific - McGeorge Law School. Sacramento, California, April 9-10, 2010.

“The Changing Role of the Lawyer and Professional Responsibility Education in North America,” *International Symposium in Professional Responsibility: The Societal Role of the Jurist and the Standardization of Legal Education*. Kwansai Gakuin University Law School, Nishinomiya (Osaka - Kansai area), Japan, March 15, 2010.

“Cyberstalking Meets First Amendment Meets Character and Fitness,” Panel Sponsored by Section on Women in Legal Education. *Association of American Law Schools Annual Conference*. New Orleans, Louisiana, January 9, 2010.

“The Role of Government Attorneys and the Global War on Terror,” Professional Responsibility Panel Discussion, *Federalist Society National Lawyers’ Convention*. Washington, D.C., November 12, 2009.

“Ethics in Government Lawyering: Detainee Interrogation and the Torture Memoranda,” Panel Presentation sponsored by the ACLU and Federalist Society. University of Connecticut School of Law. Hartford, Connecticut, October 15, 2009.

“The Public Responsibilities of Judges in a Liberal Democracy: The Problem of Pluralism,” Special Workshop: The Public Responsibility of the Judge in a Liberal System of Justice, *IVR World Congress of Philosophy of Law and Social Philosophy*. Beijing, China. September 19, 2009.

“The Institutional Architecture of Independence,” *Advising the New U.S. President: How Legal Advice Will Reshape Foreign Policy in the Next Administration (Showcase Presentation)*. ABA Section of International Law, Fall Meeting. Brussels, Belgium. September 25, 2008.

“Legal Advising and the Rule of Law,” Keynote Address. *Third International Legal Ethics Conference [ILEC III]*. Gold Coast, Australia. July 15, 2008.

“Why Can’t Legal Advisors Be Formalists? Can They Be Positivists?” *(First) Legal Ethics Shmooze*. Fordham Law School, New York, New York. June 1-3, 2008.

“Ethical Obligations of the Capital Defense Team: Protecting Disabled Clients from Themselves,” *National Seminar on the Development and Integration of Mitigation Evidence*. Habeas Assistance and Counsel Training Project, Baltimore, Maryland. May 29, 2008.

“Jurisprudence and Judicial Ethics,” *Special Workshop on Legal Ethics*, 23d World Congress of Philosophy of Law and Social Philosophy. Krakow, Poland, August 2, 2007. [[SSRN Link](#).]

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“Lawyers and Core Values: A Comparative Perspective,” *Symposium: The Forefront of American Legal Ethics: Social Change and the Role of Lawyers*, Japanese-American Society for Legal Studies. Hosei University, Tokyo, Japan. September 10, 2006.

“The Key Issues of Legal Ethics in the United States: A Synopsis and Analysis,” *Inaugural Public Lecture of the Aichi Legal Ethics Society*. Center for Asian Legal Exchange, Nagoya University, Nagoya, Japan. September 8, 2006.

“Normativity and Integrity in Professional Ethics,” *Legal Ethics: Professional Ethics and Personal Integrity [ILEC II]*, University of Auckland, New Zealand. June 23-25, 2006.

“Torture, Legal Ethics, and the Separation of Law and Morality,” Lecture at University of Sydney Law School. Sydney, NSW, Australia. June 14, 2006.

Commentator on Robert S. Summers, *Form and Function in a Legal System*, Cornell Law School Book Symposium. March 29, 2006.

“Litigation Funding,” *American Bar Association National Conference on Professional Responsibility*, Chicago, Illinois. June 1-4, 2005.

“Judicial Ethics: A Reprise of Recent Events,” Federalist Society Professional Responsibility Section. National Press Club, Washington, D.C. April 6, 2004.

“Pluralism and Preclusion,” *Religious Values and Corporate Decision Making*, Fordham University Law School. New York, New York. February 23, 2004.

Program Chair and Moderator, *When a Lawyer Stood Tall: Sharing and Understanding Stories of Lawyer Heroes*, Association of American Law Schools Annual Meeting. Atlanta, Georgia. January 6, 2004.

Invited Participant, *Moral Theory and Its Practical Application: An Interdisciplinary Seminar*, Center for the Teaching and Study of Applied Ethics, University of Nebraska – Lincoln. June 14-19, 1999.

Faculty Workshop Presenter at University of Akron Law School, University of Arizona Law School, University of Auckland Philosophy Department, Australian National University Research School of Social Sciences, Boston College Law School, Brooklyn Law School, Cardozo Law School, Cornell Law School, Dalhousie Law School (Halifax, Nova Scotia), University of Denver Law School, Duke Law School, Georgetown Law School, University of Houston Law School, University of Nevada - Las Vegas School of Law, New York University Law School Lawyering Faculty, Notre Dame Law School, University of Otago Law School (Dunedin, New Zealand), Queen’s University Faculty of Law (Kingston, Ontario), St. John’s University School of Law, St. Louis University School of Law, Suffolk University Law School, Texas A&M Law School, University of San Diego Law School, University of Southern California Law School, University of Texas Law School, Villanova Law School, University of Virginia Law School, University of Washington – Seattle School of Law, Washington University School of Law, Washington and Lee Law School, Washington and Lee

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Philosophy Department, Willamette University School of Law, Yale Law School Legal Theory Workshop.

OTHER PROFESSIONAL ACTIVITIES

Visiting Professor, Bennett University School of Law. Greater Noida, Uttar Pradesh, India, January 13-17, 2020.

Outside Ethics Counsel and Member of Advisory Board, Omni Bridgeway (formerly known as Bentham IMF).

Vice Chair and Subcommittee Co-Chair, New York State Commission on Statewide Attorney Discipline. April – September 2015.

Multistate Professional Responsibility Exam (MPRE) drafting committee, 2007-present.

Visiting Professor, Tel Aviv University, Buchman Faculty of Law, Zvi Meitar Center of Advanced Legal Studies. Tel Aviv, Israel, May 10-29, 2013.

2012 Sanford D. Levy Memorial Award from the New York State Bar Committee on Professional Ethics.

Visiting Fellow, Legal Issues Centre, Faculty of Law, University of Otago. Dunedin, New Zealand. February – June 2012.

Visiting Professor, University of Auckland Philosophy Department, Summer Term 2012.

Co-Reporter, ABA Commission on Ethics 20/20, Alternative Litigation Finance Working Group, 2011-12.

Dean's Distinguished Visitor, University of Southern Queensland (Law School, Faculty of Business). Toowoomba, Queensland, Australia. September 20 - October 1, 2010.

Guest lecturer in legal ethics, torts, cyberspace law, and introduction to American law, at the faculties of law of Chulalongkorn and Thammasat Universities. Pursuant to Bajrakitiyabha Faculty Exchange Program. Bangkok, Thailand, November 2008.

SERVICE ACTIVITIES

Internal

Associate Dean for Academic Affairs, 2017-2020.

W. Bradley Wendel
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Faculty Appointments Committee, 2006-07, 2007-08, 2008-09, 2009-10 (chair), 2012-13, 2013-14, 2014-15, 2015-16.

Academic Program and Curriculum Committee, 2015-16, 2016-17 (chair), 2017-18 (*ex officio*), 2018-19 (*ex officio*).

Law School Self-Study Committee (chair), 2015.

Professional Development Committee, 2015-17, 2017-18 (chair), 2018-19.

Faculty Advisor, Christian Legal Society, 2014-present.

Lectures on torts and legal ethics for the Cornell Prison Education Program, Auburn State Prison, Auburn, N.Y.

Editor, *American Legal Ethics Library*, Cornell Legal Information Institute, 2003-12.

Cornell Law School representative to the International Ph.D. Program in Institutions, Economics, and Law, administered by the Università di Torino (Turin, Italy), École Polytechnique (Paris, France), Universiteit van Gent (Ghent, Belgium), and Cornell Law School, 2004-07. Faculty in Program Seminar, “Comparative Perspectives on the Legal Profession,” Ph.D. program in Institutions, Economics, and Law. Real Collegio Carlo Alberto, Moncalieri, Italy. March 20-23, 2006.

“Comparative Legal Systems: Different Perspectives, Different Emphases,” Summer Law Institute, Suzhou, China. A program of Kenneth Wang School of Law, Soochow University; Cornell Law School; Bucerius Law School. Summer 2007.

External

Treasurer (2016 – 2018) and Vice-President (2018 – present), International Association of Legal Ethics (IALOE).

Co-Chair, Evangelical Lutheran Church in America (ELCA) Task Force on Women and Justice, 2011-19. *Faith, Sexism, and Justice* Social Statement was adopted at the 2019 Churchwide Assembly.

Prize Committee Member, American Inns of Court – Warren E. Burger Prize for scholarship in the areas of professionalism, ethics, civility, and excellence, 2019 -.

Editor, *Legal Ethics and Professional Responsibility*, published by the Social Science Research Network (SSRN).

Co-founder (with John Dzienkowski and John Steele) of *LegalEthicsForum.com*, a weblog dedicated to legal ethics and professional responsibility issues.

W. Bradley Wendel
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Book Reviews Editor, *Legal Ethics* (Hart Publishers, Oxford, U.K.), 2003-10.

Selection committee for AALS Professional Responsibility Section, Fred Zacharias Memorial Prize for the outstanding paper in professional responsibility, 2010-17.

Planning committee for ABA Center for Professional Responsibility Annual Meeting, 2006-07.

Executive committee of AALS Professional Responsibility Section, 2003-05, and nominating committee, 2007-08.

Peer reviewer for Oxford University Press, Princeton University Press, NYU Press, Stanford University Press, *Legal Theory*, *Legal Ethics*, *Journal of Empirical Legal Studies*, *McGill Law Journal*, *Political Studies*, *Law and Social Inquiry*, *Journal of Law and Religion*, *Journal of Legal Education*. Member of editorial board of the Korean Journal of Law and Society.

Continuing Legal Education (CLE) faculty in legal ethics for the National Attorneys General Training & Research Institute, the North Carolina Bar Association annual meeting (“Truth or Consequences: A Lawyer's Responsibility to Be Truthful,” December 8, 2017); Capital Region Bankruptcy Bar Association, Ohio Association of Criminal Defense Lawyers, Practicing Law Institute, Lawline, American Corporate Counsel Association, Washington State Society of Healthcare Attorneys, New York State Bar Association, NYSBA Committee on Women and the Law, Finger Lakes Women’s Bar Association, and Tompkins County Bar Association, as well as at Cornell Law Alumni Association meetings in Albany, Buffalo, New York City, Chicago, Philadelphia, San Francisco, Los Angeles, Seattle, and reunion CLE in Ithaca.

Pro Bono

Pro bono activities include expert witness and legal advising services to the Cornell Death Penalty Project and capital defense lawyers around the country; national CLE seminars in Atlanta, Baltimore, Charlotte, Chicago, Miami, New Orleans, New York City, Philadelphia, Pittsburgh, Seattle, and Washington, D.C., on the duties of lawyers in capital defense, habeas corpus, and mitigation practice; CLE presenter at specialized and regional bar association gatherings in Boise, Columbus, and Cooperstown; volunteer legal advisor, Loaves and Fishes, Ithaca.

INTERESTS

I am an instrument-rated private pilot, the drummer in an alt-country/Americana band, and an enthusiastic home cook.