The Eighth Amendment to the US Constitution prohibits the infliction of cruel and unusual punishments. However, no method of executing prisoners has ever been deemed by the Supreme Court to constitute Cruel and Unusual Punishment. Constitutional challenges to the dominant mode of executing prisoners today – lethal injection – are hobbled by a lack of clinical data that would reveal the likelihood this method might inflict gratuitous pain. Here, we assess the contemporary Eighth Amendment jurisprudence, including its legal and scientific limitations, and suggest modifications.

Since 1976, the Supreme Court has consistently ruled that the death penalty is not inherently cruel and unusual and therefore does not categorically violate the Eighth Amendment’s prohibition on the infliction of cruel and unusual punishments. Yet litigation surrounding capital punishment continues at a high volume. The vast bulk of this litigation, over the past four decades, has tended to focus on what Justice Blackmun referred to as “tinkering with the machinery of death.” The consequence of this generation of tinkering has been the refinement of the process of selecting those eligible for the death penalty from the larger universe of those who commit homicide and the refinement of the process for sentencing convicted murderers to death. At this point in the history of the death penalty, therefore, the ostensible constitutionality of capital punishment, as a general proposition, is a given; nevertheless, specific modes of execution can in fact violate the Eighth Amendment’s Cruel and Unusual punishments clause. Accordingly, our focus here is on modalities.

Any contemporary attention to a specific mode of execution will perforce focus on one form or another of lethal injection, because nearly all executions in the United States occur by lethal injection. Thus, over the past decade, from 2009 through July 31, 2019, 364 inmates were put to death in the United States. Of that total, 358 (or > 98%) were executed by lethal injection. (Of the remaining six, one (in Utah) was killed by firing squad, and five (three in Virginia and two in North Carolina) were electrocuted.)

Driven in large part by the Supreme Court’s unwillingness to revisit the general constitutional question involving the permissibility of capital punishment per se, lawyers representing death row inmates have often shift-
ed their focus to safeguarding their clients’ interests by seeking to ensure that the manner of inflicting death is humane; and because the dominant manner of inflicting death is lethal injection, the drug (or drugs) employed in the process— including the method of obtaining them, the manufacturing process, their age and shelf life, and so forth— as well as the mechanism by which the drugs are introduced into the condemned, have been litigated extensively. Over the last two decades, hundreds of challenges to the lethal protocol,9 pursued in the Supreme Court, the lower federal courts, and some state courts, have given rise to a rich body of case-law. This article examines this body of doctrine and comments on two defects in the decisional law pertaining to these lethal injection challenges, with a particular focus on one of these defects that has not received an appropriate degree of attention in either the case-law or the academic literature.

1. THE TWO KEY PRINCIPLES OF EXECUTION PROTOCOL LITIGATION

While litigation surrounding lethal injection is comparatively recent, this general category of constitutional attack (i.e., challenges to a particular execution modality) has relatively deep roots, and these roots are evident in contemporary doctrine. Thus, challenges to a specific execution protocol have reached the Supreme Court of the United States since the 19th century. In the first such case, Wilkerson v Utah,10 the Court held that death by firing squad did not constitute cruel and unusual punishment. (Indeed, the Court has never deemed a particular method of execution to be cruel and unusual.) Wilkerson appears to be the first instance where the Court attempted to draw the constitutional line between an execution method consistent with the Eighth Amendment and one that runs afoul:

Difficulty would attend the effort to define with exactness the extent of the constitutional provision which provides that cruel and unusual punishments shall not be inflicted; but it is safe to affirm that punishments of torture, such as those mentioned by the commentator referred to, and all others in the same line of unnecessary cruelty, are forbidden by that amendment [sic] to the Constitution.11

Out of this passage emerged the distinction between permissible modes of execution, on the one hand, and torture, on the other.12 Put somewhat differently, unless the infliction of death involves torture, it is permissible, as a method. It follows that carrying out a lawfully authorized death sentence does not amount to cruel and unusual punishment unless it is accompanied by torture, where torture is defined as the infliction of gratuitous pain, i.e., any pain beyond that which is necessary to accomplish the death of the execution victim.13 Put yet another way, although it may be the case that any method of putting someone to death involves some potential degree of pain, that possibility does not render the challenged method inherently cruel and unusual; rather, the method is constitutional unless death could be accomplished without inflicting at least the degree of pain associated with the challenged method. (While this manner of stating the principle seems to suggest an inherent degree of comparison between two or more methods, we suggest below the principle can be applied in many cases by focusing solely on the procedure being employed, rather than comparing it to other alternatives.)

Following the reinstatement of the death penalty in 1976, the first state to carry out an execution was Utah, which executed Gary Gilmore by firing squad in 1977. In 1982, Texas became the first state to put an inmate to death by lethal injection, but until the early 1990s, electrocution was as common as lethal injection as an execution method (with some states, including Mississippi, California, Arizona, and North Carolina continuing to use the gas chamber). By the mid to late 1990s, however, lethal injection was the dominant mode for carrying out death sentences in the US.14

For more than twenty years, death penalty states with a lethal injection protocol used a three-drug cocktail to carry out the execution.15 The first drug, sodium thiopental, a barbiturate, rendered the inmate unconscious; the second, pancuronium bromide, acted as a paralytic agent; and the third, potassium chloride, induced cardiac arrest. Based on two ideas— that the sodium thiopental could wear off before the execution was complete, and that the paralytic agent played no essential role in causing death and, to the extent it did contribute to an inmate’s death, it caused excessive pain (hence, torture) in doing so— challenges to this three-drug protocol began to reach the federal courts around 2005 and 2006. In 2008, the Supreme Court decided Baze v Rees16 and affirmed the constitutionality of Kentucky’s use of this three-drug cocktail for carrying out lethal injections.

Beginning in Baze, and continuing through its decision in Glossip v Gross,17 which rejected a challenge to Oklahoma’s lethal injection protocol, and Bucklew v Precythe,18 which rejected a challenge to Missouri’s protocol, the Court reaffirmed the central idea dating to Wilkerson— that a particular method of execution violates the Eighth Amendment’s cruel and unusual punishments clause only if it inflicts gratuitous pain— and it also developed another.

This second idea, which had its roots in Rees but did not mature until later, is the requirement that any inmate challenging a particular method of execution as likely to inflict unnecessary pain must identify a “feasible, readily implemented” alternative method that would “significantly reduce a substantial risk of severe pain.”19 Put
more directly, an inmate challenging a method of execution as likely to cause gratuitous pain cannot prevail on the Eighth Amendment claim without articulating a better (i.e., less painful) mode. Inmates, in short, must prescribe their own methods of death before they can prevail on a claim that a state’s chosen method amounts to cruel and unusual punishment.20

2. LEGAL AND SCIENTIFIC SHORTCOMINGS OF THE COURT’S METHOD-OF-EXECUTION JURISPRUDENCE

There is no comprehensive definition of what makes a legal rule defective, but one certain defect is when an ostensible rule applies to only a single and narrow category of disputes.21 The Supreme Court’s peculiar notion that a punishment cannot be cruel and unusual unless an inmate challenging that punishment can himself articulate an analogous punishment that would result in less pain is subject to criticism for this very reason: because the doctrine rests on no generalizable principle.22

In other constitutional contexts (i.e., contexts other than capital punishment), there is no such burden placed on someone asserting her constitutional rights. A prisoner, for example, who argues that guards used excessive force to subdue her is not obligated to demonstrate precisely how she could have been subdued using lesser force. Indeed, it is noteworthy that the Court’s excessive force doctrine, which is also rooted in the Eighth Amendment’s Cruel and Unusual Punishments clause, is similar to its death penalty jurisprudence in terms of its prohibition on the infliction of unnecessary pain, yet prisoners raising a claim of excessive force are not stopped from prevailing even where they are unable to identify available alternative uses of force.23

Similarly, someone who sues a police force or officer for brutality following an arrest or detention does not have to show how the officer could have done the job without using brutality; the burden is merely to show that the force was excessive, i.e., more than necessary.24 If, for example, a fleeing suspect was immobilized by a taser, then kicking that suspect following immobilization was excessive, because it was unnecessary to the objective. By way of analogy, an inmate who challenges a three-drug protocol by arguing the intermediate drug (the paralytic agent) is unnecessary is making a similar claim. Yet the additional burden – that the inmate provide evidence comparing the risk of pain under one protocol with the risk of pain under another – is a distinctive and unique burden. Measured by this standard, the burden on inmates facing execution to delineate an execution protocol that would not create a similar risk of infliction of gratuitous pain is defective because it is a sui generis burden for a narrow class of inmates raising an otherwise generalizable Eighth Amendment claim.

That defect, however, is not the worst problem with this dubious rule. In two different respects, the rule apparently became part of the fabric of Eighth Amendment jurisprudence inadvertently, or at least surreptitiously, and the manner in which it seeped into current doctrine illuminates its larger weakness. We discuss these two inadvertencies in turn.

First, prior to the Supreme Court’s decision in Baze v Rees,25 the principal factors in determining whether a punishment was constitutionally cruel and unusual were whether the punishment involved gratuitous pain, and whether state officials acted intentionally in inflicting it. For example, in the 1940s, the State of Louisiana attempted to carry out an execution by electrocution,26 but the inmate did not die. The inmate sought to prevent the state from trying again, on the grounds that a second attempt would be cruel and unusual. By a vote of five-to-four, the Supreme Court permitted the execution to go forward, ruling that the botched attempt was not intentional, and that a second attempt would therefore not be gratuitous or a purposeful effort to impose cruelty.27

In Rees, this erstwhile focus subtly shifted. Writing for a plurality, Chief Justice Roberts concluded an inmate cannot demonstrate that an execution modality is cruel and unusual unless he can identify an alternative procedure that “significantly reduce[s] a substantial risk of severe pain.”28 The question, therefore, was no longer the inherent cruelty of a given procedure or even the intentionality of the state’s actions; the issue had started to become comparative. (But, despite this early shift, it was not yet precisely a burden of proof imposed on the inmate.)

The case cited in closest proximity to this new proposition by Chief Justice Roberts was a decision called Farmer v Brennan;29 Farmer, however, involved an entirely distinct issue: namely, whether an Eighth Amendment violation existed when state officials had no knowledge that their actions carried with them a “significant risk of harm.”30 In other words, Farmer was a case about intentionality. But by an act of judicial alchemy, the Court in Rees took the question of whether state officials were aware of a “significant risk” of harm and transformed it into the question of whether a procedure other than the one the state intend to employ posed a significantly lower risk of harm.

Second, notwithstanding Rees, until the Supreme Court’s decision in Glossip, the focus in challenges to a state’s method of execution protocol lay simply in the question of whether that protocol presented a substantial risk of serious harm. Whether something presents a substantial risk is not an inherently comparative inquiry. For example, whether jumping out of an airplane at 30,000
feet without a parachute presents a substantial risk of serious harm can be answered without comparison to the risk of serious harm presented by jumping out of an airplane from 3 feet.31 The focus on inherent risk shifted in Glossip, however, when the Court ruled that the burden on prisoners of identifying “a known and available alternative method of execution that entails a lesser risk of pain” is “a requirement of all Eighth Amendment method-of-execution claims.”32

In support of this critical proposition – that a requirement of successful method of execution challenges is to identify a better method – the Glossip Court cited two sentences from Chief Justice Roberts’ plurality opinion in Rees, where he wrote:

A stay of execution may not be granted on grounds such as those asserted here unless the condemned prisoner establishes that the State’s lethal injection protocol creates a demonstrated risk of severe pain. He must show that the risk is substantial when compared to the known and available alternatives.33

What is important to understand about these two sentences, however, is that, in Rees, the issue of alternatives was introduced by the inmates. Concerned that Kentucky’s three-drug protocol might result in the infliction of gratuitous pain, and that state officials were aware of this possibility, the inmates proposed that a single-drug protocol be used in place of the more familiar three-drug regimen. The inmates elected to identify an alternative because the evidence was substantial that the use of the paralytic agent as part of the lethal injection protocol presented a risk of inflicting unnecessary pain, and because it was unnecessary for carrying out the execution – it was akin to beating a suspect who has already been subdued.

In rejecting their challenge, the Court in Rees focused primarily on the risks inherent in the three-drug protocol; it did not accept the inmate’s invitation to conduct a side-by-side comparison of one method with another. In point of fact, Chief Justice Roberts’ opinion expressly rejected this approach. The federal courts, he explained, are not “boards of inquiry charged with determining ‘best practices’ for executions.”34 Paradoxically, however, the Court in Glossip, by taking a line from Rees out of context, inverted the Chief Justice’s warning and reached exactly the conclusion Chief Justice Roberts had eschewed. As a result, from Glossip until now, the burden on inmates raising an Eighth Amendment challenge to an execution modality is to persuade the Court that there is a superior method – a better (if not best) practice for carrying out an execution.

Whereas Rees, properly read, rejected transforming the federal courts into boards of inquiry, Glossip now requires precisely that role. Further, this evidentiary burden is one uniquely borne by inmates facing execution. Hence, insofar as one feature of a jurisprudentially informed rule is contextual uniqueness, the core of the Court’s method of execution jurisprudence is fatally infirm.

But there is a second defect with this line of jurisprudence. This second problem is largely unremarked upon, yet substantially more significant. For even if it were appropriate to carve out a sui generis legal requirement applicable only to method of execution challenges, the specific requirement imposed by the Court in Glossip is scientifically unsound.

Ironically, Chief Justice Roberts foresaw the very problem we will address. In rejecting the inmates’ invitation that the federal courts serve as so-called boards of inquiry, Roberts noted that, aside from finding “no support in our cases,” asking courts to compare one execution protocol to another “would embroil the courts in ongoing scientific controversies beyond their expertise.”35 Yet the very inquiry Roberts accurately characterized in Rees as beyond the competence of federal courts became entrenched by Glossip at the core of what federal courts must examine in challenges to a state’s execution protocol. Consequently, in contemporary method of execution litigation, federal courts are grappling with issues Chief Justice Roberts recognized as lying beyond their competence; worse still, those very questions have no clinically-supported answers.

It may be useful to tease apart the two related yet distinct empirical questions that are embedded in Glossip’s requirement that inmates compare the risks of one protocol with the risks associated with available alternatives. Because, in this context, risk refers to a risk of severe pain, the first question is how to define severe pain. The second distinct issue is to calculate the probability a given inmate will experience that degree of pain in any specified procedure.

Severity of Pain – There is no medically established and accepted definition of severe pain, and there are no clinical data identifying factors that might result in that degree of pain (nor, a fortiori, are there any data concerning the probability those factors would inhere in any particular execution protocol).36 For example, there are at least seven accepted subjective pain scales. They do not use a uniform set of criteria for characterizing a certain level of pain, and while some scales identify severe pain as the most intense, others have various degrees of severity.37 Glossip’s requirement, therefore, that an inmate facing execution demonstrate some probability he will experience severe pain as a result of the state’s execution method is a requirement that is conceptually impossible to meet, at least as a medical or scientific matter, because there is no rigorous definition of that standard. We return to this issue, and propose a potential solution, below in Part 3. For now, it would suffice to improve the Eighth Amendment’s method of execution jurisprudence, and make it coherent, by returning the rule of Wilkerson and
replacing the adjective “severe” with “unnecessary” or “gratuitous.”

Probability – Most litigation challenging existing state execution protocols has focused on the likelihood an inmate will experience some degree of pain during the procedure. The weight of authority certainly suggests that, at least with respect to the three-drug protocol, or any protocol using midazolam as the anesthetizing agent, there is a nontrivial risk the inmate will feel the effects of additional drugs, including the paralytic agent, thereby experiencing the sensation of suffocation, and may even experience pain associated with cardiac arrest, when potassium chloride is introduced. (We refer to some of this authority in the notes.)38 It must be said, however, that regardless of the soundness of these predictions, and regardless of a small sample of anecdotal evidence consistent with these predictions, there are no reliable published clinical data that would permit a court to assess precisely the probability an inmate would experience that level of pain.39

(To our knowledge, there has been only a single attempt to determine the risk that an inmate facing execution by the three-drug protocol would not be in a state of deep unconsciousness – and therefore could experience severe pain40 – when the second and third drugs of the protocol are administered. In two related studies, Dr. Leonidas Koniaris and his team examined post-mortem serum levels of sodium thiopental in cadavers of inmates executed by lethal injection in Arizona, Georgia, North Carolina, and South Carolina and reported their findings.41 Although these findings have been subject to some criticism,42 it is not our intention to examine either those criticisms or the responses of Drs. Koniaris and Zimmers; instead, we simply stress that the data set Leonidas examined – execution victims – was small, that the time between execution and post-mortem blood sampling varied, and that other characteristics varied from one inmate to another (including, for example, the time between injection of the various drugs comprising the cocktail). Regardless, therefore, of the correctness of their analysis – i.e., that the inmates subjected to this three-drug protocol were not in states of deep unconsciousness when the second and/or third drugs of the cocktail were administered – it is quite clear that the conditions for drawing rigorous conclusions based on carefully controlled clinical environments were not present.)

3. ACQUIRING THE DATA AND REPAIRING DOCTRINE

Lethal injection litigation turns on the answers to two empirical questions and one analytic issue: first, whether a particular inmate is enduring significant pain during his execution is a factual question, the answer to which can be ascertained by contemporaneous monitoring; second, whether there is a reasonable probability any given inmate will endure significant pain during an execution is also an empirical question, the answer to which can be illuminated by acquiring a sufficiently robust data set; finally, whether any given protocol inherently includes the potential of gratuitous pain is an analytical question that can be answered outside the context of a particular execution. We address each of these issues in reverse order.

3.1. Potential for Gratuitous Pain

In the commonly used three-drug execution protocol, the intermediate drug, a paralytic agent, typically pancuronium bromide, plays no essential role in the achievement of the execution.43 In ordinary application, a paralytic is administered to facilitate surgery.44 A substantial medical-legal literature (much of which has been at issue in execution protocol litigation in various states) has demonstrated that the potential for any barbiturate or anesthetizing agent to wear off or be improperly administered creates the potential for an inmate to experience pain during the execution from the paralytic agent, and that same agent would prevent observers for recognizing the pain being endured by the inmate. Under the Supreme Court’s original and coherent understanding of the Cruel and Unusual Punishments clause, because the intermediate drug plays no role in the carrying out of the execution, it is therefore, by definition, gratuitous, and any pain suffered as a result of the introduction of that drug would therefore also, by definition, be gratuitous. A return to and faithful application of the Wilkerson standard would result in the elimination of the paralytic agent from the lethal injection protocol.

3.2. Probability of Pain Given a Defined Protocol

As we have observed, there is no body of robust data examining either the efficacy or potential complications from any particular execution protocol. However, it would be possible to acquire data germane to answering the question of probability of pain in either a controlled experimental environment involving animals, or by compiling anecdotal reports from witnesses of individual executions, or by acquiring both contemporaneous as well as post-mortem data from executions.

Using laboratory animals to help ascertain whether human victims might experience significant pain during an execution is contrary to ethical guidelines for the use of animal research,45 and we therefore do not consider it further.

Modern litigation challenging lethal injection protocols has employed both anecdotal reports of individual executions as well as data gathered from post-mortem analyses of blood serum and other tissue.46 For example,
the challenge to the Arkansas lethal injection protocol (a three-drug cocktail employing midazolam as the sedating agent), which concluded in May 2019, relied heavily on testimony from eyewitnesses present for the executions of four inmates put to death in Arkansas in 2017 using the same three-drug protocol.\(^47\) In addition, in Arkansas and in similar litigation challenging the use of midazolam in Ohio, pharmacologists or anesthesiologists testified about the risk that midazolam would (or would not) result in deep unconsciousness,\(^48\) which is significant testimony because an inmate in the deepest level of unconsciousness\(^49\) would not feel pain, but an inmate is a shallower state might, unless the sedating agent also included an analgesic, which neither Arkansas nor Ohio protocols employ.

Insofar as eyewitness accounts of so-called botched executions credibly suggest the inmates were reacting to painful stimuli, that testimony is evidence that the sedative effect of the drug they received produced only minimal or moderate sedation. However, the combination of this anecdotal reporting, coupled with expert testimony that midazolam, for example, provides neither deep unconsciousness nor analgesia\(^50\) has not been adequate to demonstrate an Eighth Amendment violation, in part, it appears, because this evidence is incapable of providing the comparative analysis contemporary doctrine requires. One obvious remedy to contemporary doctrine, therefore, which would be consistent with Rees\(^2\) but would require a modification of Glossip\(^3\) and Bucklew,\(^4\) would be simply to require that a party challenging the execution protocol demonstrate only a substantial likelihood of pain. Moreover, given that state officials can be charged with knowledge of these anecdotal reports as well as expert testimony concerning the inefficacy of midazolam as a sedating agent during the execution protocol, this approach would perhaps be consistent with Justice Thomas’s position that an Eighth Amendment violation occurs only when state officials act purposefully.\(^5\) Under this understanding of the Eighth Amendment, the evidence presented in Arkansas, Ohio, and elsewhere would establish an unacceptable probability that a three-drug protocol, or any protocol relying on midazolam as the anesthetizing agent, presents an unconstitutionally high risk of the infliction of gratuitous pain.

### 3.3. Experience of Pain During a Specified Execution

Our discussion in each of the two preceding subsections assumes a modification (albeit minor) of existing legal doctrine. However, it is also possible, from entirely within the confines of the Glossip-Bucklew framework, to obtain contemporaneous data during an execution that would reveal whether the execution victim is experiencing pain or distress. This data could in turn be used both to address the issue during the ongoing execution and to modify the procedure for future executions to avoid that pain or distress level in other execution victims.

As we have indicated, an inmate might experience pain for a variety of reasons: because of inherent defects in the execution protocol; because drugs are adulterated; because IV lines are improperly set; because the drugs are administered too quickly, or too slowly, or with imprecise spacing; etc. Contemporaneous monitoring could remediate problems resulting from any of these occurrences.

Most death penalty states do not provide for continuous technical monitoring of inmates during the execution;\(^5\) such monitoring, however, could reduce the potential for the experience of pain to a level approaching zero, if performed by trained monitors. Lawyers who challenged the execution protocol in Ohio specifically requested that inmates undergoing execution have their potential pain assessed objectively and contemporaneously using various physiological markers.\(^5\) The federal district court and, on appeal, the United States Court of Appeals for the Sixth Circuit dismissed this request for monitoring, citing, among other reasons, the fact nonmedical personnel might not understand the data, might not have the knowledge to reconcile potentially conflicting parameters, and would lack training to identify or implement any required remedial measures dictated by the data.\(^5\)

There are, however, common monitoring mechanisms widely available and reliably useful to avoid pain during an execution. An inmate requesting such monitoring would not be challenging a state’s method of execution – and would therefore not be required by Glossip-Bucklew to identify another readily implementable method for carrying out the death sentence. Instead, the inmate would simply request that he have his level of consciousness continually monitored so as to assure he was in a state such that he would not experience gratuitous pain from either a paralytic agent or a drug intended to induce cardiac arrest. For example, the so-called BIS monitor\(^5\) is widely used in general surgery and reveals in real time the depth of (un)consciousness occupied by someone receiving a general anesthesia. There are various other similar monitoring devices available. As far as we can determine, however, no currently adopted execution protocols provide for such monitoring to occur.

In addition, it would also be possible, although somewhat less useful than EEG monitoring, to use (as the Ohio lawyers requested) an EKG to measure both heart rate and blood pressure during the execution procedure. An execution victim experiencing pain or distress would show an elevated heart rate and blood pressure. Again, however, as far as we can determine, no currently adopted execution protocols provide for such contemporaneous cardiac or blood pressure monitoring.

Crafting the precise dimensions of the legal argu-
ment in support of contemporaneous monitoring is beyond our present scope; the salient point is that the argument would not require overruling or alteration of the Supreme Court’s decisions in either Glossip or Bucklew, nor would the argument preclude the states from continuing to execute inmates.

4. CONCLUSION

In the medical anaesthesia literature relating to wakefulness during surgery, there are, as Dr. J. Bruhn and his colleagues report, an alarming high number of such incidents which, according to Dr. Bruhn, make for grim reading.56 We should not be surprised, therefore, to learn there could well be consciousness of pain during an alarmingly high number of executions, especially given that, according to the published protocols of the most active death penalty states, medical professionals, if present at all, are involved in neither the introduction of the lethal drugs nor state-of-the-art monitoring that could reveal in real time distress or severe pain during the execution. The fact that inmates challenging these protocols, including the accompanying lack of contemporaneous monitoring, repeatedly lose their legal challenges is not a reflection that inmates undergoing execution are not experiencing pain; it is simply a reflection that legal doctrine requires they prove a proposition for which the data necessary to establish such proof have not been collected.

Requiring contemporaneous monitoring by personnel trained to identify indications of pain or distress and take steps to remediate that distress would not require states to abandon the death penalty or even alter their execution protocols. It would merely require them to take easily achievable steps to reduce or eliminate the possibility inmates will suffer unnecessary pain during their executions. In contrast, not adopting these easily implementable measures may help preserve the fiction that executions are painless and simple, but the refusal also demonstrates an indifference to the possibility that existing execution protocols inflict gratuitous pain and therefore involve torture.

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In 1972, a narrowly divided Court had invalidated the death penalty. See Furman v Georgia, 408 U.S. 238 (1972). But capital punishment was reinstated a mere four years later, and there has been no serious categorical challenge to it since that time. See Gregg v Georgia, 428 U.S. 153 (1976); and its companions, including Jurek v Texas, 428 U.S. 262 (1976); and Proffitt v Florida, 428 U.S. 242 (1976).

In full, the Eighth Amendment to the U.S. Constitution provides: “Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.” The Amendment has been held to apply to the states (via incorporation through the Fourteenth Amendment’s Due Process clause) in a somewhat piecemeal fashion. The “excessive fines” limitation was finally incorporated by the Supreme Court’s recent decision in Timbs v Indiana, 139 S.Ct. 682 (2019).

Collins v Collins, 510 U.S. 1141 (1994) (Blackmun, J., dissenting).

Historically, as discussed below, the widely-used form was a three-drug cocktail. Some states now employ a single drug. For a useful summary of the various drugs used in different lethal injection protocols, as well as their therapeutic class and unique pharmaceutical characteristics, see Sean Riley, Navigating the New Era of Assisted Suicide and Execution Drugs, 4 J. Law and the Biosciences 424, 426 (2017).

These executions take place in a cluster of states, mostly in the south. For although thirty states (as well as the federal government and the U.S. military) allow for the death penalty, a much smaller number of states actually put inmates to death. The federal government has not carried out an execution since 2003 (when three inmates were executed), and of the 30 states with death penalty statutes, half (i.e., 15) have not carried out an execution for at least eight years. Thus, 15 states have carried out all executions in the U.S. since 2009. Of the 364 executions from 2009 through July 31, 2019, Texas has accounted for 158 of this number, followed by Florida (32), Georgia (31), Alabama (28), Oklahoma (24), Missouri (22), and Virginia (11).

The best source of information on specific execution protocols in each of the death penalty states is the regularly updated database maintained by the Death Penalty Information Center. https://deathpenaltyinfo.org/states-and-without-death-penalty

On occasion, Justice Breyer has intimated an interest in revisiting the general question of whether capital punishment necessarily amounts to cruel and unusual punishment, but his interest is rather desultory. Thus, he questioned the death penalty’s reliability, and raised questions of its arbitrariness, in his dissenting opinion in Glossip v Gross, 576 U.S. ___, 135 S.Ct. 2726, 2755 (2015) (Breyer, J., dissenting), and in his dissent from the denial of certiorari in Jordan v Mississippi, 585 U.S. ___, 138 S. Ct. 2567, 2568 (2018) (Breyer, J., dissenting from denial of certiorari). Apart from these occasional Hamlet-like indications of an interest in addressing the broad constitutional question of the death penalty’s permissibility, however, Justice Breyer routinely votes in favor of allowing individual executions to proceed.

Traditional Eighth Amendment challenges pursued in federal court will be discussed at greater length below. Not all lethal injection litigation has followed the traditional trajectory, however. For example, Cook v Food and Drug Administration, 733 F.3d 1 (D.C. Cir. 2013), was brought by three death row inmates in three different states to challenge the importation of foreign manufactured sodium thiopental. The inmates alleged the importation of this drug violated the Food, Drug, and Cosmetics Act, and they further alleged a violation of the Administrative Procedures Act. See Beatty v FDA, 853 F.Supp.2d 30 (D.D.C. 2012), aff’d in part and rev’d in part by Cook, supra. A useful discussion of this litigation is contained in Nicholas Meyers, Cook v FDA and the Importation and release of Lethal Injection Drugs, 1 J. Law & Biosciences 209 (2014). (However, the effect of this litigation could soon be undermined due to a recently released opinion from the Department of Justice’s Office of Legal Counsel, which concludes the FDA lacks jurisdiction to regulate the drugs used in executions. Whether the Food and Drug Administration Has Jurisdiction over Articles Intended for Use in Lethal Executions, 43 Op. O.L.C. (May 3, 2019).) As of May 1, 2019, the Westlaw federal courts data base identifies 391 cases when search with the following search terms: “death /p lethal /1 injection /s constitutionality constitutional unconstitutional & da(after 2000).”

99 U.S. 130 (1879). The other notable 19th century case dealing with mode of execution is, In re Kimmeler, 136 U.S. 436 (1890). Kimmeler involved a constitutional challenge to electrocution, which was used for the first time in the U.S. in 1890. As Professor Debbie Denno has shown, Kimmeler does not actually rest on the Eighth Amendment’s Cruel and Unusual Punishments clause, even though it is frequently cited, including by the Supreme Court, for that very proposition. See Deborah W. Denno, Adieu to Electrocution, 26 Ohio Northern L. Rev 665 (2000).

Wilkerson, 99 U.S. at 135-36.

While beyond the immediate scope of our analysis here, it is perhaps worth observing that the Supreme Court has never explicitly addressed the incorporation of the Cruel and Unusual Punishments clause. Cf. Timbs, supra note 2 (noting incorporation of excessive fines clause). In O’Neil v State of Vermont, the Court noted the Eighth Amendment did not apply to the states. 144 U.S. 323, 331-32 (1892). In contrast, when the Court struck down the death penalty in Furman, see supra note 1, the Court did not provide any incorporation analysis or formally overrule O’Neil, but, as Judge (and Professor) Stephen McAllister notes, following Furman, the Court seems to have assumed that Furman deemed the Cruel and Unusual Punishments Clause to have been incorporated. See Stephen R. McAllister, The Problem of Implementing a Constitutional System of Capital Punishment, 43 U. Kan. L. Rev 1039, 1039-40 & nn. 6, 63 (1995). On the other hand, former Chief Justice Rehnquist did think the Court had deemed the Cruel and Unusual Punishments Clause to be incorporated, and therefore applied to the states, by the Fourteenth Amendment, although his statement to that effect does not include a specific citation. See Hutto v Finney, 437 U.S. 678, 717-18 (1978)(Rehnquist, J., dissenting). He may, however, have had in mind either State of La. ex rel. Francis v Reswe-
ber, 329 U.S. 459, 463 (1947), where the Court assumed without deciding the Constitution did not prohibit the state from attempting a second execution after the first attempt failed (“When an accident, with no suggestion of malevolence, prevents the consummation of a sentence, the state’s subsequent course in the administration of its criminal law is not affected on that account by any requirement of due process under the Fourteenth Amendment.”), or the subsequent opinion in Robinson v California, 370 U.S. 660 (1962), where the Court, citing Resweber, held: “[I]n the light of contemporary human knowledge, a law which made a criminal offense of such a disease would doubtless be universally thought to be an infliction of cruel and unusual punishment in violation of the Eighth and Fourteenth Amendments.” Id. at 666; see also id. at 668-69 (Douglas, J., concurring). In any case, as a practical matter, it is clear the Cruel and Unusual Punishments clause applies to the states, despite the arguable absence of an express holding so stating.

13 See, e.g., In re Kimmler, 136 U.S. 436, 443-44 (1890) (noting electrocution presumably causes death “instantaneous[ly], and consequently . . . painless[ly]”); id. at 447 (“Punishments are cruel when they involve torture or a lingering death.”). We refer at times in the following discussion to “gratuitous” pain; in this context, gratuitous is coterminous with torture, i.e., it refers to any pain in excess of the quantum required to carry out the execution of the prisoner.

14 No legal academician has written more perceptively about lethal injection litigation and the broad range of constitutional issues associated with method of execution challenges, including lethal injection, than Professor Debbie Denno. See, e.g., Deborah W. Denno, Courting Abolition, 130 Harv L. Rev 1827, 1864-66 (2017) (reviewing Steiker & Steiker, Courting Death (2016)); Deborah W. Denno, Lethal Injection Chaos Post-Baze, 102 Geo. L.J. 1331 (2014); Deborah W. Denno, The Lethal Injection Debate: Law and Science, 35 Fordham Urban L.J. 701 (2008).

15 The displacement of other modes of execution by lethal injection has been authoritatively addressed by Debbie Denno. On the history of the lethal injection protocol, see, e.g., Deborah W. Denno, When Legislatures Delegate Death, 63 Ohio St. L.J. 63, 90-91 (2002).

16 553 U.S. 35 (2008).

17 135 S.Ct. 2726 (2015).

18 139 S.Ct. 1112 (2019). Bucklew was more precisely an as-applied challenge that grew out of Bucklew’s specific medical condition. But that distinction is not relevant to our discussion.

19 553 U.S. at 52.

20 The development of this requirement that inmates identify a superior mode of execution before they could prevail on their challenge to a state’s chosen mode is succinctly covered in Megan McCracken, Legally Indefensible: Requiring Death Row Prisoners to Prove Available Execution Alternatives, 41 FEB Champion 46, 47-48 (2017). As one anonymous reviewer stressed, the Court has steadily, and almost surreptitiously, imposed an increasingly heightened burden on inmates in the lethal injection cases. We address this stealthy augmentation of the burden facing inmates below in Part 2. The upshot is that inmates who challenge the method the state intends to use to carry out their executions cannot prevail unless they identify a better modality of death. (In this context, “better” is defined as a method involving less gratuitous pain, where “gratuitous” is defined as any pain beyond that which is inherently required to put someone to death. We return to how one might measure these alternatives below.) See, e.g., Bucklew, 139 S.Ct. at 1123-25.

However, as the same reviewer reminded us, Justice Gorsuch fleetingly suggested in Baze that even if there are better methods, the Eighth Amendment may not compel the state to use them. See 139 S.Ct. at 1125 (“Nor do Baze and Glossip suggest that traditionally accepted methods of execution—such as hanging, the firing squad, electrocution, and lethal injection—are necessarily rendered unconstitutional as soon as an arguably more humane method like lethal injection becomes available.”).

Finally, the Court in Bucklew, citing Glossip, stressed that any alternative mode of execution identified by the inmate must also be capable of ready implementation. See 139 S.Ct. at 1129. The protocol modifications we suggest below in Part 3 meet this requirement of being readily implementable.

21 In a sense, when a doctrine applies to a single, narrow factual context, it does not resemble what is known as the rule of law. For a thoughtful (and non-tendentious) discussion, see, e.g., Charles Fried, Saying What the Law Is, esp. 70-77 (2004). Not surprisingly, much of the criticism of the Supreme Court’s decision in Bush v Gore, 531 U.S. 98 (2000), focused on the sense in which the Court’s ruling did not resemble a decision based on a generally applicable rule of law. See, e.g., Robin West, Reconstructing the Rule of Law, 90 Georgetown L.J. 215 (2001).

22 See, e.g., McCracken, supra note 20.

23 See Hudson v McMillian, 503 U.S. 1, 8-11 (1992).

24 E.g., Sallenger v Oakes, 473 F.3d 731, 740-42 (7th Cir. 2007).

25 553 U.S. 35 (2008).

26 State of La. ex rel. Francis v Resweber, 329 U.S. 459 (1947).

27 For excellent analysis, see Brent E. Newton, The Slow Wheels of Furman’s Machinery of Death, 13 J. App. L. & Proc. 42 (2012). Among the Court’s current members, Justice Thomas has been most committed to the idea that a punishment is not cruel and unusual unless state officials act intentionally in inflicting gratuitous pain. See, e.g., Rees, 553 U.S. at 94 (Thomas, J., concurring).

28 25 Rees, 553 U.S. at 52 (Roberts, C.J., joined by Kennedy and Alito, JJ).

29 511 U.S. 825 (1994).

30 Id. at 837-38.

31 But for a cautionary tale on experimental design, see R.W. Yeh, Parachute use to prevent death and major trauma when jumping from aircraft: randomized controlled trial, BMJ 363:k5094 (2018), available at https://www.bmj.com/content/363/bmj.k5094.

32 Glossip, 135 S. Ct at 2731 (emphasis added). For the evolution of the burden of proof placed on inmates challenging the execution protocol, see supra note 20 and text accom-
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As Drs. Zimmers and Koniaris correctly observed, “[l]ethal injection was designed and carried out without any research at all.” Teresa A. Zimmers and Leonidas G. Koniaris, Peer-Reviewed Studies Identifying Problems in the Design and Implementation of Lethal Injection for Execution, 35 Fordham Urban L.J. 919 (June 2008). In contrast, data on animal euthanasia are widely reported, and veterinarians regularly update and modify the protocol for euthanizing animals. See Eric Berger, Lethal Injection and the Problem of Constitutional Remedies, 27 Yale Law & Policy Rev 259, 267 & n. 31 (2009); Ty Alper, Anesthetizing the Public Conscience, 35 Fordham Urban L. J. 817 (2008) (noting function of paralytic is to protect witnesses, who would otherwise see a thrashing inmate, rather than to accomplish the death of the inmate).

See “Pain Assessment Scales,” Pain Assessment and Management Initiative, University of Florida College of Medicine - Jacksonville, available at http://pami.emergency.med.ufl.edu/resources/pain-assessment-scales/ As one reviewer has pointed out, the data on pain severity are thin, but not non-existent. For one meta-analysis of non-communicative ICU patients, see Isabel Freire Azevedo-Santos and Josimari Melo DeSantana, Pain Measurement Techniques: Spotlight on mechanically ventilated patients, J. Pain Res. 11:2969-80 (2018), available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6255280/

Lethal injection litigation has been pursued in a number of jurisdictions. In Ohio, the most recent litigation has focused on potential problems with the use of midazolam as the first drug in the cocktail. See In re: Ohio Execution Protocol Litigation, No. 2:11-cv-01016 (S.D. Ohio, Eastern Div 2017), ECF 1295-1 testimony of Dr. Ashish Sinha, practicing anesthesiologist, and professor of anesthesiology in the Department of Anesthesiology at the Lewis Katz School of Medicine, Temple University, in Philadelphia, Pennsylvania, at para 12 (noting, inter alia, that “midazolam has no analgesic properties” and that, on the contrary, midazolam “increases sensitivity to pain, and creates the condition hyperalgesia” (citing Michael A. Frölich, Kui Zhang & Timothy J. Ness, Effect of Sedation on Pain Perception, 118 Anesthesiology 611, 611 (2013))). See also para 18 of Sinha affidavit (noting district court’s misunderstanding of relevant science). See generally Michael A. Frölich, Kui Zhang & Timothy J. Ness, Effect of Sedation on Pain Perception, 118 Anesthesiology 611, 611 (2013); Miller’s Anesthesia (8th ed., 2015); Cowen et al., Assessing pain objectively: the use of physiological markers, Anaesthesia 70: 828-847 (2015).

See Zimmers and Koniaris, supra note 36.

We repeat here that there is no medically accepted definition of what constitutes severe pain. Commonly used pain scales are widely recognized as entirely subjective. See, e.g., James Giordano, Kim Abramson, and Mark V Boswell, Pain Assessment: Subjectivity, Objectivity, and the Use of Neurotechnology - Part One: Practical and Ethical Issues, Pain Physician 13:305-315 (2010); see also Tan, M., Singh, A., Saluja, V, Dhankhar, M., Pandey, C.K., and Jain, P., Validation of a New “Objective Pain Score” Vs. “Numeric Rating Scale” For the Evaluation of Acute Pain: A Comparative Study, Anesth Pain Med. 2016:6(1), available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4834447/. We return to the issue of measuring pain objectively below in Part 3.

41 Koniaris, et al., Inadequate Anaesthesia in Lethal Injection for Execution, 365 Lancet 1412 (2005); Zimmers, et al., Lethal Injection for Execution: Chemical Asphyxiation?, 4 PLoS Med. 0646 (2007). The Lancet study in particular proved controversial. See, e.g., Jonathan I. Groner, Response, 366 Lancet 1073 (2005); Mark Heath, et al., Response, 366 Lancet 1073 (2005) (both suggesting limitations of post-mortem extrapolation of serum thiopental levels).

42 Both Koniaris and Zimmers stand by their conclusions. See supra note 37, at 925-29.

43 See supra note 37. One anonymous reviewer correctly points out that the paralytic agent, by preventing the inmate from thrashing or otherwise exhibiting distress during the execution, helps preserve the fiction that the procedure is carefully clinically controlled and painless. This view finds support in the legal literature. See, e.g., Seema Shah, How Lethal Injection Reform Constitutes Impermissible Research on Prisoners, 45 Am. Crim. L. Rev 1101, 1136 & n. 234 (2008) (noting that, in Rees, the State of Kentucky acknowledged the role played by the paralytic was to “maintain[] an appearance of dignity”).

44 See, e.g., Charles J. Cote, et. al. (eds), A Practice of General Anesthesia for Infants and Children (6th ed. 2019) (noting role pancuronium bromide plays in cardiac surgery and other high-risk procedures).

45 Using animals in this context is obviously simply immoral, period. It is also the case, however, that any experimental design that might provide robust data relevant to the Eighth Amendment inquiry would be inconsistent with accepted scientific ethical guidelines pertaining to animal experimentation. See, e.g., Bernard E. Rollin, The Ethics of Animal Research, in Lida Kalof, ed., The Oxford Handbook of Animal Studies (2017); Curzer, H.J., Perry, G., Wallace, M.C. et al., The Three Rs of Animal Research, Sci Eng Ethics 22:549 (2016), available at https://doi.org/10.1007/s11948-015-9659-8.

In addition, as an anonymous reviewer has pointed out, it is by no means clear that results from animal studies would be admissible to establish a risk that human subjects would face a significant possibility of experiencing gratuitous pain during an execution, because many courts have excluded the results of animal studies on Daubert grounds. (The so-called Daubert standard, named after Daubert v Merrell Dow Pharmaceuticals, 509 U.S. 579 (1993), establishes the criteria for the admission at trial of expert or scientific evidence.) See, e.g., Erica Beecher-Monas, The Heuristics of Intellectual Due Process: A Primer for Triers of Science, 75 N.Y.U. L. Rev 1563,1609-13 (2000) (identifying cases). Professor Beecher-Monas is rightly critical of many of these holdings. See also Amanda Hungerford, Note, Back to Basics: Courts’ Treatment of Agency Animal Studies After Daubert, 110 Colum. L. Rev 70 (2010) (ad-
dressing cases involving possible carcinogens). Finally, while animal studies in which laboratory specimens are put to death simply in order to acquire data regarding execution protocols would be unethical, there are in fact valuable animal studies regarding monitoring of EEG oscillations to obtain contemporaneous information regarding the experience of pain. Recently, analgesic effect in rats was observed by monitoring theta wave oscillations. See Suguru Koyama, et al., An Electroencephalography Bioassay for Preclinical Testing of Analgesic Efficacy, Scientific Reports 8:16402 (November 2018). We are not aware of any similar study in humans. These studies would, however, face the problems imposed by some courts’ reading of Daubert identified in the preceding paragraph.

46 Regarding post-mortem blood serum analysis, see Koniaris, supra notes 36, 41. For a sampling of contemporaneous witness accounts reporting apparent distress exhibited by execution victims during procedures in Florida, Oklahoma, and Arizona, see Lillian Segura, Our Most Cruel Experiment Yet, in The Intercept, August 5, 2018, available at https://theintercept.com/2018/08/05/death-penalty-lethal-injection-trial-tennessee/

47 A summary of the testimony, with hyperlinks to local news coverage, can be found at https://deathpenaltyinfo.org/node/7388.

48 For the Arkansas case, see id.; for the Ohio litigation, see supra note 38.

49 There are various stages of anesthesia depths, ranging from minimal, where the subject remains conscious, to the stage where there is no response to painful stimuli. We are particularly grateful to Dr. Neville Leibman for discussing these stages with us, and how to determine during the administration of anesthesia the depth at which the recipient has reached. See generally Musizza, B. and Ribaric, S., Monitoring the Depth of Anaesthesia, Sensors (Basel) 10(12):10896–10935. doi:10.3390/s101210896, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231065/.

50 Here again we are grateful to Dr. Neville Leibman. See testimony of Dr. Sinha, supra note 38.

51 Rees, 553 U.S. at 94 (Thomas, J., concurring) (noting Eighth Amendment is violated if and only if the protocol is designed to inflict pain).

52 We are grateful to the following death penalty lawyers for providing us with copies of their respective states’ execution protocols: John Palombi and Spencer Hahn (Alabama uses an EKG only at the completion of the execution, to confirm death); Kim Stout (Arizona monitors inmate level of consciousness with an EKG, which is marked at the outset and conclusion of the execution, but protocol provides nothing in the way of adjustments if the EKG reveals distress); Kelson Bohnet (California, Kentucky, and Nevada use heart monitors, but only for purposes of confirming death by flat-line); Jonah Horwitz (Idaho monitors inmate level of consciousness with an EKG, which is marked at the outset and conclusion of the execution, but protocol provides nothing in the way of adjustments if the EKG reveals distress); Adam Rusonak (Ohio protocol provides for no monitoring); Kelley Henry (Tennessee protocol provides for no monitoring); Maurie Levin (Texas protocol provides for no monitoring). All death penalty states do provide for visual monitoring during the execution procedure.

One anonymous reviewer has communicated to us an important caveat: There may be some states that use medical professionals to monitor executions without publicly acknowledging this fact. (The anonymous reviewer informed us that discovery in a particular case revealed a certain state’s use of medical professionals for this very purpose; it so happens, however, that this state no longer carries out executions.) Further, despite the shibboleth that physicians may not participate in executions because of prohibitory AMA Guidelines, the AMA Guidelines are precisely that: guidelines; and it is impossible to gainsay that physicians have in fact participated in numerous executions. See generally Ty Alper, The Truth About Physician Participation in Lethal Injection Executions, 88 N.C. L. Rev 11 (2009); see also Jonathan I. Groner, M.D., The Hippocratic Paradox: The Role of the Medical Professional in Capital Punishment, 35 Fordham Urban L.J. 883, 889-90 (2008) (noting that, with the exception of Georgia, where physicians have played what Dr. Groner characterizes as an “active role” in executions, the involvement of physicians elsewhere is to pronounce the time of death).

Nevertheless, it remains correct to state that the published execution protocols in the states carrying out most of the nation’s executions do not provide for contemporaneous monitoring (by physicians or otherwise) that could be used to identify the infliction of gratuitous pain and to take measures to ameliorate such pain should it be identified.

53 See supra note 38. The Ohio legal team identified, inter alia, blood pressure, heart rate, and ECG.

54 See Campbell v Kasich, 881 F.3d 447, 454 (6th Cir. 2018). Considering that the lack of expertise by those who implement the execution protocol is one principal reason the inmate might experience severe pain during the procedure, the Sixth Circuit’s identification of lack of expertise as a reason not to take steps that might mitigate the risk of pain is notable.

55 The bispectral index monitor, which uses an EEG, measures consciousness from a scale of 0 to 100, with 100 being wakefulness and numbers closer to 0 indicating deeper levels of unconsciousness. General surgery is typically performed at a BIS level of 40-60. Thanks again to Dr. Neville Leibman for discussing this monitoring technology with us. See, e.g., Rani, D. and Harsoor, S., Depth of General Anaesthesia Monitors. Indian J Anaesth., 56(5):437–441 doi:10.4103/0019-5049.103956 (2012), available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3530997/ .

We do not address the cost of necessary electrodes here. For a discussion, see, e.g., Anderson, R.E., et al., Use of Conventional ECG Electrodes for Depth of Anaesthesia Monitoring Using the Cerebral State Index, British Journal of Anaesthesia 98:5, 645-648 (2007), available at https://bjaesthesia.org/article/S0007-0912(17)34850-X/fulltext

56 See Bruhn, J., Myles, P.S., Sneyd, R., and Struys, M.M.R.F., Depth of Anaesthesia Monitoring, British Journal of Anaesthesia , 97:1, 85-94 (2006), available at https://bjaesthesia.org/article/S0007-0912(17)35187-5/fulltext