

# Why Are Executions Becoming Crueler?

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## INTRODUCTION

On January 24, 2024, Kenneth Eugene Smith became the first person in the world to be executed by nitrogen hypoxia and the first person in U.S. history to undergo two entirely different execution methods,<sup>1</sup> having just survived a horribly botched lethal injection.<sup>2</sup> After sitting on Alabama’s death row for thirty-five years,

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<sup>1</sup> For an analysis of execution methods and their changing legislation across time, see generally Deborah W. Denno, *Getting to Death: Are Executions Constitutional?*, 82 IOWA L. REV. 319 (1997) [hereinafter *Constitutional*] (providing a history and analysis of all American execution methods with a detailed look at the use of electrocution, lethal gas, and lethal injection); Deborah W. Denno, *Is Electrocution an Unconstitutional Method of Execution? The Engineering of Death Over the Century*, 35 WM. & MARY L. REV. 551 (1994) [hereinafter *Engineering*] (discussing the history and creation of electrocution, including a focus on the firing squad and lethal injection); Deborah W. Denno, *When Legislatures Delegate Death: The Troubling Paradox Behind State Uses of Electrocution and Lethal Injection and What It Says About Us*, 63 OHIO STATE L.J. 63 (2002) [hereinafter *Legislatures*] (examining the adoption of lethal injection and state-wide variations in lethal injection protocols); Deborah W. Denno, *Six U.S. Execution Methods and the Disastrous Quest for Humaneness*, in THE ELGAR COMPANION TO CAPITAL PUNISHMENT AND SOCIETY 144 (Benjamin Fleury-Steiner & Austin Sarat eds., 2024) [hereinafter *Humaneness*] (analyzing the history and modern status of all execution methods and how they interrelate).

<sup>2</sup> Prior to his execution by nitrogen hypoxia, Kenneth Smith filed a Second Amended Complaint, which detailed his first failed execution by lethal injection on September 22, 2022. On the night of Smith’s bungled injection, he was strapped to a gurney for two minutes before the Eleventh Circuit issued a stay. He was then left gurney-strapped for the next two hours, during which time he believed that his execution was imminent because he was never informed of the stay, and officials did not permit him to speak with his counsel. After those first two hours, the stay was lifted, and executioners attempted to insert the IV lines into Smith, but had challenges doing so. For the next two hours, executioners repeatedly stabbed and prodded Smith to create an incision, all the while causing him “excruciating” pain. Around midnight, approximately four hours after Smith was first gurney-strapped, he was informed that the execution was postponed. See generally Complaint, Smith v. Hamm,

Smith had faced a series of execution method possibilities, starting first with electrocution, then lethal injection, and, after finding that torturous method unfathomable, choosing instead to die by Alabama's newly adopted method of nitrogen hypoxia.<sup>3</sup> The consequences of that option were disastrous. The State's promise to Smith of a quick and humane death was countered by multiple eyewitnesses describing Smith's slow and painful agony as he suffocated in torment.<sup>4</sup> One conclusion was clear: Alabama's newest method appeared even crueler and more incompetently carried out than those preceding it, while also lacking any cultural or societal anchoring.<sup>5</sup>

How could such a disturbing death occur in a country that prides itself on life-enhancing progress and cutting-edge modernity, touting advances in medicine, technology, and artificial intelligence?<sup>6</sup> In the realm of execution methods, the U.S. should be drawing closer, not further away, from our society's shared values and norms of betterment, especially those reflected in constitutional doctrine. Indeed, at least theoretically, the history of the American death penalty is characterized by states' repeated efforts to implement more humane methods of executing condemned inmates, most derived from the precepts of the Eighth Amendment's Cruel and Unusual Punishment Clause<sup>7</sup> and its evolving standards of decency.<sup>8</sup>

As sincere as this approach to execution methods has initially appeared, its outcome has been staggering in its inefficiency and barbarism. From 1608 (this country's first documented execution) to 2025, the United States has created and retained six different execution methods: hanging, the firing squad, electrocution,

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No. 2:22-cv-00497 (M.D. Ala. Nov. 25, 2022) (arguing in part that nitrogen hypoxia would have been more humane than Smith's experience with lethal injection); *Kenneth Smith Describes Alabama's Failed Attempt to Execute Him*, DEATH PENALTY INFO. CTR. (Mar. 14, 2025), <https://deathpenaltyinfo.org/kenneth-smith-describes-alabamas-failed-attempt-to-execute-him> [<https://perma.cc/B8CT-K3UA>] (examining the attempt to execute Smith by lethal injection laid out in Smith's Second Amended Complaint.); Ed Pilkington, *What Is It Like to Survive an Execution by Lethal Injection?*, GUARDIAN (Dec. 28, 2022), <https://www.theguardian.com/world/2022/dec/28/lethal-injection-surviving-execution-attempt-alabama> [<https://perma.cc/JQ7E-NQG2>] (detailing the efforts to execute Smith by lethal injection within the context of other botched lethal injection executions).

<sup>3</sup> See *infra* notes 210–218 and accompanying text.

<sup>4</sup> See *infra* notes 210–218 and accompanying text.

<sup>5</sup> See *infra* notes 210–218 and accompanying text.

<sup>6</sup> See Claire Henshaw, *Top 5 AI-driven Medical Innovations in the United States*, WORLD HEALTH EXPO INSIGHTS (Nov. 17, 2023), <https://www.worldhealthexpo.com/insights/ai-automation/top-5-ai-driven-medical-innovations-in-the-united-states> [<https://perma.cc/MTA7-WFWV>].

<sup>7</sup> See U.S. CONST. amend. VIII. For a penetrating and rigorously researched exploration of the origins and purpose of the Eighth Amendment's Cruel and Unusual Punishment Clause, see JOHN D. BESSLER, *CRUEL AND UNUSUAL: THE AMERICAN DEATH PENALTY AND THE FOUNDERS' EIGHTH AMENDMENT* (2012).

<sup>8</sup> *Trop v. Dulles*, 356 U.S. 86, 101 (1958).

lethal gas, lethal injection, and nitrogen hypoxia.<sup>9</sup> Ostensibly, states devised each new method to supplant an earlier existing method's egregiously botched failures—lethal injection being the most pronounced example because it is the only method currently allowable in all death penalty states.<sup>10</sup> Yet, such a goal has been accompanied by legislative, judicial, and correctional evidence demonstrating how each method failed so appreciably to become more civilized than the method superseded.<sup>11</sup>

To assuage the vast number of challenges with lethal injection, a handful of states have experimented with the latest technique—nitrogen hypoxia—or have turned to the past with the resurrection of an older method—the firing squad.<sup>12</sup> Yet, the executions of Kenneth Smith by nitrogen hypoxia and the other inmates who have followed him are seemingly just as problematic, if not worse, than their predecessors.<sup>13</sup> Likewise, the 2025 botched firing squad execution of Mikal Mahdi has reinforced the public's open questions about that method's comeback after fifteen years of nonuse, despite the firing squad's history of being relatively problem-free.<sup>14</sup> Such trends expose the reality that all six methods are highly problematic in different ways, each riddled with opportunities for bungles that contravene the goals of the Eighth Amendment.

Indeed, the execution of Anthony Boyd, the eighth (and, as of this writing, last) person to be executed by nitrogen hypoxia, has fortified perceptions about the

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<sup>9</sup> See generally *Humaneness*, *supra* note 1 (explaining and analyzing the methods and history behind the six different types of executions in American history).

<sup>10</sup> See generally *id.* (explaining how each successive method attempted to improve upon the perceived moral failings of the previous method.); see *infra* tbl. 1; see *Methods of Execution*, DEATH PENALTY INFO. CTR., <https://deathpenaltyinfo.org/executions/methods-of-execution> [<https://perma.cc/D3AU-25BS>] (last visited Sep. 17, 2025); *Authorized Methods by State*, DEATH PENALTY INFO. CTR., <https://deathpenaltyinfo.org/executions/methods-of-execution/authorized-methods-by-state> [<https://perma.cc/2DJR-HL8J>] (last visited Nov. 16, 2025) (noting that all states list lethal injection to some capacity).

<sup>11</sup> *Legislatures*, *supra* note 1, at 90–95; Deborah W. Denno, *Courting Abolition*, 130 HARV. L. REV. 1827, 1862–63 (2016) [hereinafter *Abolition*]; Deborah W. Denno, *Back to the Future with Execution Methods*, in THE EIGHTH AMENDMENT AND ITS FUTURE IN A NEW AGE OF PUNISHMENT 212, 212–13 (Meghan J. Ryan & William W. Berry III eds., 2020) [hereinafter *Future*]. For a superb account of the social, cultural, and political forces that have steered the American death penalty's constitutional course, see CAROL S. STEIKER & JORDAN M. STEIKER, *COURTING DEATH: THE SUPREME COURT AND CAPITAL PUNISHMENT* (2016).

<sup>12</sup> *Future*, *supra* note 11, at 231; *Humaneness*, *supra* note 1, at 157; see also Deborah W. Denno, *The Firing Squad as a “Known and Available Method of Execution” Post-Glossip*, 49 U. MICH. J.L. REFORM 749, 781 (2016) [hereinafter *Firing Squad*]; Alexandra L. Klein, *When Police Volunteer to Kill*, 74 FLA. L. REV. 205, 207–08 (2022); *Methods of Execution*, *supra* note 10.

<sup>13</sup> See *supra* notes 210–232 and accompanying text.

<sup>14</sup> See David Greenwald, *South Carolina's Firing Squad Execution Raises Questions on Humane Death*, VANGUARD NEWS GRP., (May 14, 2025), <https://davisvanguard.org/2025/05/firing-squad-execution-botched-sc/> [<https://perma.cc/CG24-LE6N>].

appalling application of this newest method.<sup>15</sup> Prior to his execution, Boyd filed a stay requesting an execution by firing squad, which the Supreme Court denied, and to which Justice Sotomayor dissented, along with Justice Kagan and Justice Jackson. Justice Sotomayor described execution by nitrogen hypoxia as a “torturous suffocation lasting up to four minutes.”<sup>16</sup> Unbeknownst to Justice Sotomayor, those “torturous” four minutes would be nearly five times longer for Boyd.<sup>17</sup> As soon as Boyd’s executioners administered the gas, witnesses observed Boyd lift his legs off the gurney and take “deep, shuddering breaths” for approximately fourteen minutes, as though he was “gasping for air.”<sup>18</sup> According to Boyd’s spiritual advisor, Boyd seemed as though he “was conscious and fighting for his life for at least nineteen minutes,” telling reporters, “It’s torture . . . We are . . . suffocating people to death.”<sup>19</sup> As reporter Lee Hedgepeth made clear, “Alabama subjected Anthony Boyd to the longest nitrogen execution in U.S. history.”<sup>20</sup>

One potentially viable solution is for states to go back in time over the course of centuries and readopt the firing squad, the method considered the least inhumane, albeit the one with the most brutal reputation.<sup>21</sup> Yet, arguments that Mahdi’s executioners may have been acting intentionally when they missed his chest target suggest that no method, not even the simplest, is foolproof. Likewise, efforts to find a new method that was presumably botch-free resulted in the discovery of the highly problematic application of nitrogen hypoxia. With all the attention paid to the technical viability of execution methods, it can be easy to forget that performing executions is a very human process. Executioners are not exempt from retributive impulses, nor are legislatures immune from the pressures to keep executions moving, no matter the consequences.

In the first half of 2025 alone, we have seen rapid and unprecedented changes in the execution methods landscape. Idaho has already elected to designate the firing squad as its primary method of execution for 2026.<sup>22</sup> In turn, Arkansas became the

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<sup>15</sup> See Nicholas Bogel-Burroughs, *Lengthy Execution by Nitrogen Gas in Alabama Renews Concerns Over Method*, N.Y. TIMES (Oct. 24, 2025), <https://www.nytimes.com/2025/10/24/us/alabama-nitrogen-execution-anthony-boyd.html> [<https://perma.cc/HP7L-SXYM>].

<sup>16</sup> *Boyd v. Hamm*, No. 25A457 (25-5928) slip op. at 2 (U.S. Oct. 23, 2025) (Sotomayor, J., dissenting).

<sup>17</sup> See Amanda Lee Myers, *Alabama Executes Killer with Nitrogen Gas Amid Objections Over ‘Gratuitous Suffering’*, USA TODAY (Oct. 23, 2025), <https://www.usatoday.com/story/news/nation/2025/10/23/alabama-execution-anthony-todd-boyd/86861744007/> [<https://perma.cc/FME3-U9LE>].

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> Lee Hedgepeth, *Hope in the House of Death*, TREAD (Oct. 23, 2025), <https://www.treadbylee.com/p/hope-in-the-house-of-death> [<https://perma.cc/22ZM-TA23>].

<sup>21</sup> See *Firing Squad*, *supra* note 12, at 791–92; Greenwald, *supra* note 14 (describing Mahdi’s execution).

<sup>22</sup> *Methods of Execution*, *supra* note 10.

fifth state to adopt nitrogen hypoxia.<sup>23</sup> Strikingly, two states—Florida and Tennessee—have statutes that embrace the turmoil of changing execution methods by enabling the use of any constitutional method if lethal injection or electrocution is not an option.<sup>24</sup> For example, Florida has amended its death penalty statute to allow for any execution method not deemed unconstitutional to be on the table, opening the door for the state’s adoption of the firing squad and nitrogen hypoxia, and also for a nearly extinct method like hanging to be revived or a wholly new and untested method to be considered.<sup>25</sup> Tennessee has a similar statute, yet is also seeking to expand its lethal injection protocol by introducing a bill that has passed the Senate to include “pharmaceutical fentanyl.”<sup>26</sup> These examples serve as snippets of the chaos that is swiftly evolving in a sphere where state ignorance and error have always been intertwined with shocking desolation. Why, then, are executions getting worse? In short, because the political need for executions has never been so desperate and reckless.

This article examines the trajectory of the United States’ six execution methods—a topic relevant to every death row inmate—with a particular focus on some states’ recent adoption of nitrogen hypoxia and reinvigoration of the firing squad. A major premise is that, apart from nitrogen hypoxia, every method, no matter how faulty, started as a sincere, pragmatic effort to make executions more humane based on the cultural science and norms of the time. Yet, states’ efforts to push for the death penalty’s survival at any cost have propelled the retention of antiquated execution protocols with flawed and unscientific origins, along with unqualified executioners that only impede the pursuit of execution humaneness.<sup>27</sup> Indeed, even an outdated but generally workable method like the firing squad can be cruel if executioners make it so.<sup>28</sup> In desperation, the result is the creation of the nitrogen hypoxia method that is unmoored by any connection to current society and culture and completely divorced from scientific backing, all in an effort to keep the death penalty going. Earlier in this country’s history, states spent far more time evaluating their proposed execution methods, using the resources available at the

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<sup>23</sup> *Id.*; See also Andrew DeMillo, *Arkansas Governor Signs Legislation Allowing Executions by Nitrogen Gas*, ASSOC. PRESS (Mar. 18, 2025), <https://apnews.com/article/executions-arkansas-nitrogen-sarah-huckabee-sanders-4af9ebd60f272f65a09e266444bb0831> [<https://perma.cc/BMZ4-3EDT>].

<sup>24</sup> See *infra* tbl. 1; FLA. STAT. § 922.105 (2025) (stating that “a method not deemed unconstitutional” may be used if lethal injection or electrocution is not an option); TENN. CODE ANN. § 40-23-114 (2024) (stating that if lethal injection or electrocution is held to be unconstitutional, then “any constitutional method of execution” will be used).

<sup>25</sup> See C.A. Bridges, *Will Florida Use Firing Squads, Hanging, Nitrogen Gas in Executions? New Law Allows It*, TALLAHASSEE DEMOCRAT (June 3, 2025), <https://www.tallahassee.com/story/news/politics/2025/06/03/new-florida-law-allows-execution-nitrogen-gas-hanging-firing-squad/84006301007/> [<https://perma.cc/22CT-YUJV>]; see also FLA. STAT. § 922.105 (2024).

<sup>26</sup> S.B. 491, 114th Gen. Assemb., Reg. Sess. (Tenn. 2025).

<sup>27</sup> See *infra* Part II and accompanying text.

<sup>28</sup> See Greenwald, *supra* note 14, and *infra* notes 157–170 and accompanying text.

time, irrespective of how faulty the methods later proved to be. In contrast, states have recently made knee-jerk changes without attempting to reflect or evaluate, all in an effort to appease governmental pressures and expectations.

The following discussion begins with detailing the current status of the types of execution techniques adopted across death penalty states up to November 1, 2025. It then analyzes the six execution procedures and their societal and cultural touchstones, explaining how they were implemented in the context of the times. The next part highlights the shared flaws and unscientific origins and protocols of the methods, as well as their reliance on untrained, unqualified, or unknown executioners. While legislatures and courts claim that states move from one technique to the next to enhance greater humaneness, history shows that such switches are primarily propelled by constitutional challenges to a state's particular technique. In theory, rendering a state's execution method unconstitutional could threaten the death penalty's very existence, hence one reason states hold tight to a problematic method for decades. Some states go back in time by adopting older methods (such as electrocution or the firing squad), while other states attempt to experiment with wholly new and untested methods (for example, nitrogen hypoxia).

This article ends by focusing on this country's "perfect storm" of recent executions and their divorce from current cultural science or norms, a development juxtaposed with the resurgence of the firing squad, one of this country's oldest and most entrenched execution methods. A confluence of forces, especially at the start of 2025, has bypassed concerns about the humaneness of executions and focused nearly exclusively on their mere perpetuation. On all levels, the U.S. experiment with the death penalty has surged, resulting in execution outcomes that are worse than they ever have been, especially in light of today's push to pursue the latest technological advances.

## I. EXECUTION METHODS BY STATE IN 2025

Table 1 presents how the different execution methods are used in the twenty-seven states that have the death penalty. Notably, lethal injection is an option to some degree in all death penalty states, while some states also enable a choice between lethal injection and additional procedures. However, the nature of that choice varies among the states, thereby explaining why Table 1 categorizes some states as both "single-method" and "choice" states. For example, lethal injection falls into three different types of categories. It is (1) the sole method of execution in twenty states; (2) one of two or more methods of execution in fifteen choice states; and (3) one of three methods of execution in three states (Alabama, Louisiana, and South Carolina).

Four states (Arizona, Kentucky, Tennessee, and Utah) are included in both the "single-method" and "choice" state categories because their respective legislatures did not render their execution methods retroactive when the states adopted lethal

injection; therefore, these states allow choices for some inmates.<sup>29</sup> New Mexico is a bit of an outlier. The state's repeal of the death penalty in 2009 was not retroactive, leaving two people on death row who can be executed by lethal injection. Because this circumstance is not a choice between methods, Table 1 lists New Mexico as a state without the death penalty as opposed to a single-method state.<sup>30</sup>

**Table 1. Execution Methods by State 2025\***

<b><i>Single-Method States (20)</i></b>
Arizona • Georgia • Idaho • Indiana • Kansas • Kentucky • Mississippi** • Montana • Nebraska • Nevada • North Carolina • Ohio • Oklahoma** • Oregon† • Pennsylvania† • South Dakota • Tennessee • Texas • Utah • Wyoming (Also—the U.S. Government, U.S. Military)
<b><i>Choice States (15)**</i></b>
Lethal injection or electrocution (6): Alabama • Florida± • Kentucky • Louisiana • South Carolina • Tennessee± Lethal injection or firing squad (3): Idaho • South Carolina • Utah Lethal injection or lethal gas (3): Arizona • California† • Missouri Lethal injection or nitrogen hypoxia (3): Alabama • Arkansas • Louisiana
<b><i>States Without the Death Penalty (23)</i></b>
Alaska • Colorado • Connecticut • Delaware • Hawaii • Illinois • Iowa • Maine • Maryland • Massachusetts • Michigan • Minnesota • New Hampshire± • New Jersey • New Mexico± • New York • North Dakota • Rhode Island • Vermont • Virginia • Washington • West Virginia • Wisconsin (Also—the District of Columbia)
<b><i>Notes to Table 1:</i></b>
* Some states are listed twice in Table 1. Alabama, Louisiana, and South Carolina are listed twice under the Choice States category because they are the only states that allow inmates to choose among three execution methods. Alabama enables an inmate to choose between lethal injection, electrocution, or nitrogen hypoxia. South Carolina enables an inmate to choose between electrocution (the fallback), the firing squad, or lethal injection, “if it is available at the time of election.” Louisiana authorizes the

<sup>29</sup> See *infra* tbl. 1.

<sup>30</sup> See *infra* tbl. 1.

secretary of the Department of Public Safety and Corrections to notify the condemned within seven days of execution, which of three possible methods may be used, “with no preference” regarding which method: lethal injection, nitrogen hypoxia, or electrocution. Four states—Arizona, Kentucky, Tennessee, and Utah—fall into both the Single-Method State category and the Choice State category because their provisions declaring lethal injection as the sole method are not retroactive, allowing inmates sentenced before a specific date to choose their method of execution. Arizona allows inmates sentenced before November 15, 1992, to choose between lethal injection and lethal gas. Kentucky allows inmates sentenced before March 31, 1998, to choose between lethal injection and electrocution. Tennessee allows inmates sentenced before January 1, 1999, to choose between lethal injection and electrocution. Utah allows inmates sentenced before May 3, 2004, to choose between lethal injection and the firing squad.

\*\* Mississippi and Oklahoma share identically worded multitiered statutes. Each state “[a]uthorizes use of nitrogen hypoxia if either lethal injection is held unconstitutional or ‘otherwise unavailable’; then authorizes electrocution if nitrogen hypoxia and lethal injection are held unconstitutional or ‘otherwise unavailable’; then finally authorizes firing squad if nitrogen hypoxia, lethal injection, and electrocution are held unconstitutional or ‘otherwise unavailable.’” Idaho authorizes using the firing squad if lethal injection is unavailable or held unconstitutional. The firing squad will be the primary method in Idaho as of July 1, 2026. Arkansas authorizes the use of electrocution if lethal injection and nitrogen hypoxia are “invalidated by a final and unappealable court order.” Wyoming “[a]uthorizes lethal gas if lethal injection is held unconstitutional.” Utah authorizes the use of the firing squad if lethal injection drugs are unavailable or if lethal injection is held to be unconstitutional. Also, if a prisoner was sentenced to death before May 3, 2004, he may choose the firing squad as the method of execution. Florida and Tennessee have expanded their options to basically include all available methods. Under Florida’s July 1, 2025, change, “[i]f electrocution or lethal injection is held to be unconstitutional . . . or if the acquisition of chemicals necessary for lethal injection by the department becomes impossible or impractical, all persons sentenced to death for a capital crime shall be executed by a method not deemed unconstitutional.” Fla. Stat. Ann. § 922.105 (2025). Under Tennessee’s July 1, 2023, change: “[i]f lethal injection or electrocution is held to be unconstitutional . . . all persons sentenced to death for a capital crime shall be executed by any constitutional method of execution.” TENN. CODE ANN. § 40-23-114 (2024).

† States with Gubernatorial Moratoria.

± As of May 2019, the three states that allowed hanging as an execution method (Delaware, New Hampshire, and Washington) have abolished the death penalty. In New Hampshire, the repeal of the death penalty was not retroactive, leaving one person on death row who could potentially still be executed by hanging. Likewise, New Mexico’s repeal of the death penalty in 2009 was not retroactive, leaving two people on death row who can be executed by lethal injection. The information in Table 1 reflects updates as of November 2025. See *infra* notes 31–32 and accompanying text.

No state lists hanging as an execution technique, although one non-death penalty state, New Hampshire, also an outlier, could still potentially use it. The three

states that previously enabled hanging in modern times (Delaware, New Hampshire, and Washington) abolished the death penalty and eliminated hanging by default. Yet, because New Hampshire's repeal of the death penalty is not retroactive, there is still one person on New Hampshire's death row who could potentially be hanged. In turn, five states allow the firing squad (Idaho, Mississippi, Oklahoma, South Carolina, and Utah)—the highest number of legislative adoptions of this older method since at least 1888.<sup>31</sup> Over the course of a century and a half, the U.S. has undergone a daunting array of adoptions, dumps, and modifications of all six execution methods, seemingly unparalleled by any other country.<sup>32</sup>

Overall, then, while all death penalty states still have lethal injection as an option, in recent years states have started to switch to other methods, most notably nitrogen hypoxia and the firing squad. For example, more than at any other time in this country's history, states permit a choice between methods of execution or provide an alternative procedure if lethal injection is found unconstitutional or "otherwise unavailable." Indeed, most choice states maintain an overwhelming complexity of tiered methods or options to ensure the death penalty's survival in that state if a method is continuously challenged or declared unconstitutional. For example, while Mississippi and Oklahoma authorize lethal injection, both states provide a rank of substitutes if lethal injection is rendered unconstitutional or unavailable. Sequentially, these fallbacks start with nitrogen hypoxia, then electrocution, and finally the firing squad, thereby ensuring that no inmate will go unexecuted because of an unavailable execution method. Likewise, Florida and Tennessee have broadened their choices to basically all available methods, theoretically even hanging, if lethal injection or electrocution are rendered unconstitutional. At this point, seemingly any method is game if it provides a chance that an execution will go forward.<sup>33</sup> This degree of recklessness has no precedent, and certainly no cultural foundation.

## II. EXECUTION METHODS IN CULTURAL CONTEXT

All execution methods, except for nitrogen hypoxia, have a cultural fit of some kind with the science and norms of the era in which they were developed, which can explain their emergence. While each method is barbaric and defunct in its own way, at one time, that method was part of a societal progression toward a seemingly more humane and effective procedure. This part discusses the context of these cultural fits

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<sup>31</sup> See *Engineering*, *supra* note 1, at 624; *Constitutional*, *supra* note 1, at 351–52 n.195; *supra* tbl. 1; William W. Berry III, *State Constitutional Limits on Nitrogen Hypoxia Executions*, 2025 U. ILL. L.R. 1121, 1129 (2025); *Methods of Execution*, *supra* note 10.

<sup>32</sup> See generally *Constitutional*, *supra* note 1, at 339; *Legislatures*, *supra* note 1, at 65; *Humaneness*, *supra* note 1; Deborah W. Denno, *The Lethal Injection Quandary: How Medicine Has Dismantled the Death Penalty*, 76 FORDHAM L. REV. 49, 62 (2007) [hereinafter *Medicine*]; Deborah W. Denno, *Lethal Injection Chaos Post-Baze*, 102 GEO. L.J. 1331, 1339 (2014) [hereinafter *Chaos*]; *Future*, *supra* note 11, at 212.

<sup>33</sup> See *supra* tbl. 1.

and why, due to them, nitrogen hypoxia and the expansion of execution choices among choice states are especially alarming. Like the last decade of changes in lethal injection, nitrogen hypoxia is fueled primarily by a dangerously pragmatic level of desperation to keep the death penalty going, thereby making so-called modern executions even crueler. The broadening umbrella of choices compounds the hazards of these circumstances.

### A. Hanging

Hanging was this country's dominant death penalty method and socio-cultural symbol for centuries.<sup>34</sup> Brought over to the U.S. by English colonists, the first hanging was likely that of Daniel Frank in 1623 in Virginia.<sup>35</sup> By 1853, the method was the "nearly universal form of execution,"<sup>36</sup> used in 48 "states" (many of which were still considered territories at that time).<sup>37</sup> Likewise, hanging was the most common method of execution in England until 1964, when the last executions in the United Kingdom were conducted.<sup>38</sup>

Initially, the procedure's requirements were simplistic; they involved a rope, an executioner who could tie the rope into a knot around a person's neck, and a sufficiently strong structure that could hold an inmate's body as it dropped.<sup>39</sup> The eventual building of gallows and scaffolding created the opportunity for faster and more forceful drops, heightening the chances for a clean break of an inmate's neck (the "hangman's fracture") and a quick death.<sup>40</sup> Yet, this long-drop method prompted a series of gruesome and visually shocking strangulation deaths, during which inmates would defecate, talk, or have bulging eyes.<sup>41</sup>

Such disturbing events were especially pronounced in the seventeenth through the start of the nineteenth century, when outdoor hangings became public ritualistic festivities held before thousands of spectators, often charging admission tickets.<sup>42</sup> With time, critics perceived the crowds "as a rabble out for a good time, too caught up in a carnival spirit to appreciate the moral lessons that were being imparted."<sup>43</sup>

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<sup>34</sup> DAVID GARLAND, *PECULIAR INSTITUTION: AMERICA'S DEATH PENALTY IN AN AGE OF ABOLITION* 122 (2010) (noting that "[r]eligious officials, speeches, and symbols stood at the center of the American scaffold, giving its rituals a different shape from those of early-modern Europe").

<sup>35</sup> See JACK SHULER, *THE THIRTEENTH TURN: A HISTORY OF THE NOOSE* 55 (2014).

<sup>36</sup> See *Campbell v. Wood*, 18 F.3d 662, 697 (9th Cir. 1994) (citing *State v. Frampton*, 627 P.2d 922, 934 (1981)).

<sup>37</sup> See *Campbell*, 18 F.3d at 697 (9th Cir. 1994) (Reinhardt, J., concurring in part and dissenting in part).

<sup>38</sup> *Id.* at 684.

<sup>39</sup> See STUART BANNER, *THE DEATH PENALTY: AN AMERICAN HISTORY* 44 (2002).

<sup>40</sup> *Id.* at 45–46.

<sup>41</sup> *Id.* at 47.

<sup>42</sup> See *Engineering*, *supra* note 1, at 564; SHULER, *supra* note 35, at 158.

<sup>43</sup> See BANNER, *supra* note 39, at 146.

Likewise, New York's growing opposition to capital punishment during the 1820s and 1830s was fueled by the public's enthusiasm over and commercialization of public hangings.<sup>44</sup> While hangings were eventually moved to the far more private jail yards, the method's critics gathered steam, fueling the efforts of attorneys to challenge hanging through the end of the twentieth century.<sup>45</sup>

By the early 1990s, the evidence accumulated on hanging's failures started to gain traction in the courts. While the Ninth Circuit Court of Appeals in *Campbell v. Wood*<sup>46</sup> held that execution by hanging does not violate the Eighth Amendment, the Court's 6–5 *en banc* opinion was confined only to how hanging was conducted in Washington State. Soon after *Campbell*, the United States District Court of the Western District of Washington held in *Rupe v. Wood*<sup>47</sup> that although hanging under Washington State's protocol "generally" did not violate the Eighth Amendment, Mitchell Rupe's execution would because his obesity created a "significant risk" he would be decapitated, an outcome that could not "be dismissed as a 'possible error' or 'accident.'"<sup>48</sup> While no state has ever declared hanging unconstitutional, the revelations from *Campbell* and *Rupe* impacted how hanging was perceived, both legally and societally, especially given the method's horrific association with violence and racial lynching.<sup>49</sup>

In 2025, with one exception, hanging no longer exists, the first time this country has retired any execution method. While New Hampshire abolished the death penalty in 2019, the decision was not retroactive, leaving one inmate on death row who could choose to be hanged if he is ever executed, an unlikely scenario.<sup>50</sup> In 1996, Delaware's Billy Bailey was the last person to be hanged in the U.S.,<sup>51</sup>

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<sup>44</sup> *Engineering*, *supra* note 1, at 563–64.

<sup>45</sup> *Id.* at 565; *Future*, *supra* note 11, at 231; GARLAND, *supra* note 34, at 118.

<sup>46</sup> *Campbell v. Wood*, 18 F.3d 662, 674 (9th Cir. 1994).

<sup>47</sup> *Rupe v. Wood*, 863 F. Supp. 1307, 1314 (W.D. Wash. 1994).

<sup>48</sup> *Id.*

<sup>49</sup> See generally NGOZI NDULUE, DEATH PENALTY INFO. CTR., ENDURING INJUSTICE: THE PERSISTENCE OF RACIAL DISCRIMINATION IN THE U.S. DEATH PENALTY (Robert Dunham ed., 2020), <https://files.deathpenaltyinfo.org/documents/Enduring-Injustice-Race-and-the-Death-Penalty-2020.pdf> [<https://perma.cc/E6QC-FNSQ>] (describing the instrumental role hanging has played in racial subordination and its continuing association with racial injustice); SHULER, *supra* note 35, at 142; GARLAND, *supra* note 34, at 117–20; STEIKER & STEIKER, *supra* note 11, at 17–26.

<sup>50</sup> See *supra* tbl. 1; Joan T. Stylianos, *Written in Granite: Capital Punishment in New Hampshire*, SUN, (Dec. 30, 2024), <https://www.lowellsun.com/2024/12/30/written-in-granite-capital-punishment-in-new-hampshire/> [<https://perma.cc/LLD3-9ALC>] (noting that Michael Addison is the only inmate on New Hampshire's death row even though the state's last execution occurred in 1939).

<sup>51</sup> SHULER, *supra* note 35, at 231–33; *Delaware*, DEATH PENALTY INFO. CTR., <https://deathpenaltyinfo.org/state-and-federal-info/state-by-state/delaware> [<https://perma.cc/3Z42-5TXU>] (last visited Sep. 16, 2025).

therefore ceasing a method supplanted by the rash of states moving to other seemingly more appealing methods.<sup>52</sup>

### B. *Electrocution*

Hanging's modern disappearance downplays its strong cultural connection to this country's history and its role in prompting the creation of new execution methods.<sup>53</sup> During the first half of the nineteenth century, parts of the United States experienced substantial social and political upheavals that brought progressive humanitarian reforms highly critical of how hangings were carried out, especially in New York.<sup>54</sup> This movement fueled New York legislators' repeated requests for the State to improve capital punishment and perhaps abolish hanging altogether. In 1885, the Governor of New York informed the state legislature that hanging was barbaric, choosing a year later to appoint a Commission of three prominent citizens to determine "the most humane and practical method known to modern science" of carrying out the death penalty.<sup>55</sup>

The Commission's search included a study of every execution method ever used worldwide. Yet, the Commission's final selection of electrocution was seemingly influenced by commercial and business interests—not scientific knowledge or testing—and swayed in large part by an intense financial competition brewing between George Westinghouse and Thomas Edison during the country's "Age of Electricity."<sup>56</sup> Edison believed that if the Commission endorsed Westinghouse's current for use in an electric chair, the public would associate that particular current with death and danger, and deter Westinghouse's financial ascendance.<sup>57</sup> The Commission never suggested a specific current, yet Edison's influential lobbying encouraged executioners to turn to Westinghouse's product.<sup>58</sup>

New York's decision to enact electrocution as an execution method prompted a series of legal and scientific conflicts necessitating the U.S. Supreme Court's involvement in the case of William Kemmler, the first person designated to die by electrocution. In *In re Kemmler*,<sup>59</sup> the Court resisted deciding Kemmler's claim that the use of electrocution to inflict death was cruel and unusual punishment, holding instead that the Eighth Amendment did not apply to the states. Likewise, the Court

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<sup>52</sup> See *Engineering*, *supra* note 1, at 683; *Constitutional*, *supra* note 1, at 401; *Legislatures*, *supra* note 1, at 82; *Future*, *supra* note 11, at 212; see *supra* tbl. 1.

<sup>53</sup> GARLAND, *supra* note 34, at 116–26.

<sup>54</sup> *Engineering*, *supra* note 1, at 563–66.

<sup>55</sup> *Id.* at 566.

<sup>56</sup> *Id.* at 568–69.

<sup>57</sup> *Id.*

<sup>58</sup> *Id.* at 570–71.

<sup>59</sup> *In re Kemmler*, 136 U.S. 436, 447–49 (1890).

deferred to the New York legislature's conclusion that electrocution was not a cruel and unusual punishment under the State's Electrical Execution Act.<sup>60</sup>

On August 6, 1890, Kemmler became the first person in the world to be executed by electrocution, an event the media described in great detail to capture the confusion, mistakes, and extreme physical violence that Kemmler endured. Because Kemmler's body twitched a half-minute after being pronounced dead, officials reapplied the electrical current to ensure his demise, during which Kemmler's hair and flesh began to burn. Electricians claimed the machinery was grossly defective, while Edison finger-pointed at the ineptitude of the doctors involved.<sup>61</sup>

Kemmler's botched execution and evidence that he may have felt pain and suffered did not deter the method's adoption in other states, which also faced horrifyingly conducted electrocutions. Indeed, a half-century later, the method's constitutionality would again come under the Supreme Court's Eighth Amendment review in *Louisiana ex rel. Francis v. Resweber*,<sup>62</sup> in which a highly divided Court enabled the electrocution execution of 15-year-old Willie Francis, despite Francis surviving the first attempted execution due to an incompetent and careless execution team and faulty chair. Yet, in 1947, the Eighth Amendment still did not apply to the states, further hampering a Court encumbered by conflict and political maneuvering.<sup>63</sup> Although two years later, in 1949, the number of electrocution states peaked at twenty-six, no additional states ever adopted the increasingly troublesome method.<sup>64</sup>

Other influential changes were also taking shape. In 1962, the Court held in *Robinson v. California*<sup>65</sup> that the Eighth Amendment applies to the states through the Fourteenth Amendment's Due Process Clause—a holding further set forth in *Furman v. Georgia*,<sup>66</sup> when Justice Douglas relied on *Francis* and *Robinson* to establish the Eighth Amendment's applicability to the states. The *Furman* Court's impact would also be substantially broader, concluding in a famously splintered opinion that the death penalty's imposition in the cases before it violated the Eighth and Fourteenth Amendments, primarily due to their arbitrariness.<sup>67</sup> With *Furman*,

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<sup>60</sup> *Engineering*, *supra* note 1, at 585–87. As the Steikers note, before the Supreme Court began regulating the death penalty more proactively, the most pervasive constitutional challenges concerning the death penalty were focused on execution methods, especially electrocution and the firing squad. See STEIKER & STEIKER, *supra* note 11, at 26–31. That said, the Court bypassed such “invitations” to constitutional regulation. *Id.* at 26.

<sup>61</sup> *Engineering*, *supra* note 1, at 600–01.

<sup>62</sup> *Louisiana ex rel. Francis v. Resweber*, 329 U.S. 459, 463–64 (1947).

<sup>63</sup> See Deborah W. Denno, *When Willie Francis Died: The “Disturbing” Story Behind One of the Eighth Amendment’s Most Enduring Standards of Risk*, in DEATH PENALTY STORIES 17, 90–91 (John H. Blume & Jordan M. Steiker eds., 2009) [hereinafter DEATH PENALTY STORIES].

<sup>64</sup> *Constitutional*, *supra* note 1, at 365.

<sup>65</sup> *Robinson v. California*, 370 U.S. 660, 675 (1962).

<sup>66</sup> *Furman v. Georgia*, 408 U.S. 238, 239–41, 309 (1972).

<sup>67</sup> *Furman* was a per curiam decision consisting of just one paragraph and nine separate opinions. *Id.* at 239–470.

the Court struck down every death penalty system in the country, coming close to abolishing capital punishment.<sup>68</sup>

Yet, a mere four years later, Georgia vowed to follow *Furman*'s dictates to rehabilitate the country's death penalty process. In 1976, in *Gregg v. Georgia*,<sup>69</sup> the Court made clear that the death penalty did not fundamentally violate the Eighth Amendment, upholding against a constitutional challenge the viability of newly created guided-discretion standards comparable to those proposed by Georgia.<sup>70</sup> While *Gregg*'s restoration drew to a close a near-decade moratorium of the death penalty (from 1967 to 1976), it would also prompt the search for a new execution method given electrocution's decades-long history of failure.<sup>71</sup>

That search uncovered lethal injection in 1977,<sup>72</sup> but not soon enough to stop electrocution's continuing mayhem in the execution process. While for over a decade (from 1979 to 1990), Fred Leuchter controlled the modern design and creation of the electric chair, evidence shows his typical electric chair did not differ substantially from the one created for William Kemmler.<sup>73</sup> As Leuchter explained, a properly conducted electrocution should produce no pain and instantaneous unconsciousness; yet an improperly employed electrocution can cause an inmate to experience a slow and highly painful death.<sup>74</sup> Eventually, revelations of Leuchter's lack of expertise and professional ethics led to the closure of his business; yet there seemed to be no steady executioners to conduct or repair the remaining electric chairs, creating havoc for wardens still in need of the devices.<sup>75</sup>

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<sup>68</sup> See *id.* at 411 (Blackmun, J., dissenting); see also BANNER, *supra* note 39, at 264 (noting that the nine opinions "divided along philosophical lines").

<sup>69</sup> *Gregg v. Georgia*, 428 U.S. 153, 176–78, 187 (1976).

<sup>70</sup> *Id.* at 187, 206–07 (plurality opinion).

<sup>71</sup> See *Abolition*, *supra* note 11, at 1862.

<sup>72</sup> See *infra* Section II. D (discussing lethal injection).

<sup>73</sup> *Engineering*, *supra* note 1, at 626–76. Electric chairs, including Leuchter's chair, remained remarkably the same over the decades. Granted, the voltage generally increased over time and the procedures varied in terms of how many electrodes might be applied to the body and at what intervals. *Id.* at 630–31. For example, Leuchter's chair applied 2,640 volts and five amperes of electric current in two one-minute jolts because, according to him, that approach kept the body intact for the family's burial. *Id.* at 631–32. Likewise, Leuchter created electric chair parts so that prison personnel could easily purchase them, or he replaced the older leather harnesses with nylon seatbelts, allowing prison personnel to remove the inmate's body from the chair more quickly. In addition, he provided taller backrests to secure the prisoner's head and a helmet that ensured the prisoner greater privacy. *Id.* at 632–33. But these cosmetic and practical changes aside, the overall electrode-inflicting method remained consistent, which accounts for why the process continued to botch so egregiously since its inception. As Leuchter explained, most of the electric chairs he examined country-wide were "nearly a century old, and either in 'questionable condition' or 'downright defective,'" and thus might have induced pain. *Id.* at 633. For example, Virginia's electric chair, "Old Sparky," remained unchanged from 1908 to 1990; yet, even when the state decided to "rewire" it to improve it, the outcome was still flawed. *Id.* at 648–49.

<sup>74</sup> *Engineering*, *supra* note 1, at 633.

<sup>75</sup> *Id.* at 665–66, 658–59, 661–62.

These challenges were most evident in the context of the method's consistently high-profile botches and blunders, which scholars have meticulously documented.<sup>76</sup> Florida's electrocutions were particularly appalling. Both Jesse Tafero's in 1990 and Pedro Medina's in 1997 were disturbing scenes in which each inmate's head caught on fire, emanating high flames and burning flesh, while each inmate clenched and released agonal noises, sickening witnesses.<sup>77</sup>

Allen Lee Davis's 1999 execution was so visibly shocking it attracted worldwide notice when the Florida Supreme Court posted color photos of the deceased Davis on its website. The photos depicted deep burns on Davis's head and body while a nosebleed—caused by a five-inch-wide body strap the guards used to hold Davis's head to the chair—bloodied his face and shirt. The strap was so large and tight that it had started to asphyxiate Davis and squash his nose even before the electrocution began.<sup>78</sup>

Davis's execution was a turning point in Florida's electrocution process, although other states reacted differently to electrocution botches. While most states continued switching to lethal injection (as did Florida), some retained their original execution method.<sup>79</sup> It was not until 2009 that electrocution ceased being the sole method of execution in any state (Nebraska being the last holdout), although electrocution remains an option in several states.<sup>80</sup> Notably, two states have rendered electrocution unconstitutional: Georgia (in *Dawson v. State*<sup>81</sup>) and Nebraska (in *State v. Mata*<sup>82</sup>).

Given electrocution's troubling track record, it may appear odd that, since 2009, some inmates still choose electrocution over lethal injection.<sup>83</sup> Yet, the reason for their selection says more about lethal injection's own disturbing history than the purported draw of electrocution. Inmates are electing to revert to a method created before the turn of the twentieth century (electrocution) rather than one of the latest methods deemed purportedly more humane (lethal injection) because they are aware of the decades of failed “medicalized” substitutes, including lethal gas.

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<sup>76</sup> See *Botched Executions*, DEATH PENALTY INFO. CTR., <https://deathpenaltyinfo.org/executions/botched-executions> [<https://perma.cc/8GDL-CXGJ>] (last visited Mar. 31, 2025) (providing an overview of scholars discussing botched executions).

<sup>77</sup> See *Engineering*, *supra* note 1, at 670; *Constitutional*, *supra* note 1, at 360; *Legislatures*, *supra* note 1, at 81.

<sup>78</sup> See *Legislatures*, *supra* note 1 at 78–79.

<sup>79</sup> See *Chaos*, *supra* note 32, at 1341–42.

<sup>80</sup> See *supra* tbl. 1.

<sup>81</sup> *Dawson v. State*, 554 S.E.2d 137, 143–44 (Ga. 2001).

<sup>82</sup> *State v. Mata*, 745 N.W.2d 229, 278 (Neb. 2008).

<sup>83</sup> See *Future*, *supra* note 11, at 228; *Execution Database*, DEATH PENALTY INFO. CTR., <https://deathpenaltyinfo.org/facts-and-research/data/executions> [<https://perma.cc/53NU-XZP2>] (last visited Dec. 3, 2025).

### C. Lethal Gas

Some states never adopted electrocution instead of hanging, opting instead for a potentially more humane and viable technique. In 1921, Nevada was the first state to change from its prior methods (hanging and shooting) to lethal gas to accommodate the State's new Humane Death Bill.<sup>84</sup> Yet, Nevada's goal for greater compassion toward inmates has a worrisome backstory. The state's initial use of gas for lethal purposes was inspired by the U.S. military's extensive research on chemical warfare conducted during World War I. Some military and political leaders vowed to exterminate as humanely as possible enemy civilian populations, whom they thought should not be subjected to the same pain and suffering as soldiers.<sup>85</sup> Nevada borrowed the idea of lethal gas for executions from the U.S. military's research.

This sequence of events regarding lethal gas is typically not known to the public, which assumes that the U.S. gas chamber derives from the chambers used during the Nazi Holocaust, when the opposite is true.<sup>86</sup> For example, the Nevada Department of Corrections used gas to execute an American inmate sixteen years before the Nazis employed gas to kill anyone, with the Nazis eventually selecting the same type of hydrocyanic acid used in American gas chambers.<sup>87</sup> While the association of lethal gas with the Nazi Holocaust impaired gassing's reputation as a more humane method of execution in the U.S.,<sup>88</sup> lethal gas still gained ground in this country. From 1924, when Gee Jon, a Chinese immigrant convicted of murder, became the first person executed by lethal gas in a Nevada gas chamber,<sup>89</sup> up to 1977, thirteen states had enacted the use of lethal gas.<sup>90</sup> During this time, states continuously tinkered with different gases, chambers, and strategies to make the technique more palatable to the public.<sup>91</sup> Indeed, after 1935, lethal gas surpassed electrocution as the preferred new execution method, even though electrocution was adopted by more states. However, since 1973, no state has enacted lethal gas as an execution method.<sup>92</sup>

Lethal gas execution botches created extraordinary problems and Eighth Amendment challenges from the start, with inmates gasping, convulsing, straining,

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<sup>84</sup> See *Constitutional*, *supra* note 1, at 366.

<sup>85</sup> See generally SCOTT CHRISTIANSON, *THE LAST GASP: THE RISE AND FALL OF THE AMERICAN GAS CHAMBER* (2010).

<sup>86</sup> *Id.* at 13.

<sup>87</sup> *Id.* at 1–12.

<sup>88</sup> *Id.*

<sup>89</sup> *Id.* at 1; see *Constitutional*, *supra* note 1.

<sup>90</sup> See *Constitutional*, *supra* note 1, at 407, tbl. 6.

<sup>91</sup> See CHRISTIANSON, *supra* note 85, 69–124.

<sup>92</sup> See *Constitutional*, *supra* note 1, at 367; see *Legislatures*, *supra* note 1, at 83; see generally *Future*, *supra* note 11; *Humaneness*, *supra* note 1; *Execution Database*, *supra* note 83.

and shouting out in pain during executions that took far longer than predicted.<sup>93</sup> The horrifying 1983 execution of Jimmy Gray (for twelve minutes) and later those of Edward Earl Johnson (for seventeen minutes), Connie Ray Evans (for thirteen minutes), Leo Edwards (for fourteen minutes), and Donald Harding (for eleven minutes) were visible to dozens of witnesses and reporters as inmates thrashed in pain, suffocating slowly.<sup>94</sup> While California in *Fierro v. Gomez*,<sup>95</sup> would be the first state to determine that lethal gas violated the Eighth Amendment, a decision the Ninth Circuit affirmed,<sup>96</sup> the Supreme Court vacated<sup>97</sup> that decision with a refrain not uncommon in choice-method states. As the Court explained, because California's provision enables inmates to choose lethal injection, those inmates, therefore, have another option apart from gas, and it is moot if one of their choice methods may be unconstitutional.<sup>98</sup>

On March 3, 1999, in Arizona, Walter LaGrand was the last individual executed by lethal gas,<sup>99</sup> opting for it rather than lethal injection as a form of protest. Tragically, seventy-five years after Gee Jon's execution, LaGrand required even longer to die—eighteen minutes,<sup>100</sup> a botched procedure for sure. While, in 2025, three states have retained lethal gas as a “choice,”<sup>101</sup> the feasibility of such an option remains unlikely given the method's torturous track record.

#### D. Lethal Injection

By the early 1970s, the country's immense challenges with hanging, electrocution, and lethal gas had existed for decades and without any sign of improvement, a circumstance ripe for the country's next turn. In 1976, the Supreme Court reinstated the death penalty<sup>102</sup> after a four-year moratorium imposed by *Furman v. Georgia*<sup>103</sup> and a nine-year hiatus overall<sup>104</sup> that invited renewed consideration of how death row inmates would be executed. Strikingly, one of the first signs of a direction emanated from then-Governor Ronald Reagan's suggestion

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<sup>93</sup> See generally CHRISTIANSON, *supra* note 85.

<sup>94</sup> See *Constitutional*, *supra* note 1, at 424–28.

<sup>95</sup> *Fierro v. Gomez*, 865 F. Supp. 1387, 1415 (N.D. Cal. 1994).

<sup>96</sup> See *Fierro v. Gomez*, 77 F.3d 301, 307 (9th Cir. 1996).

<sup>97</sup> See *Gomez v. Fierro*, 519 U.S. 918, 919 (1996).

<sup>98</sup> *Id.*

<sup>99</sup> See *Methods of Execution*, *supra* note 10.

<sup>100</sup> See CHRISTIANSON, *supra* note 85, at 229.

<sup>101</sup> See *supra* tbl. 1.

<sup>102</sup> See *Gregg v. Georgia*, 428 U.S. 153, 209 (1976).

<sup>103</sup> *Furman v. Georgia*, 408 U.S. 238, 239 (1972).

<sup>104</sup> See STEIKER & STEIKER, *supra* note 11, at 60–67.

in 1973 that inmates be put to death by an injection procedure similar to the humane euthanizing of horses.<sup>105</sup>

With bolstering from medical professionals and the prospect of videotaped executions, the injection idea took hold. A societal connection was clear.<sup>106</sup> In 1977, Oklahoma became the first state to pass a lethal injection law, with Texas following the next day and, by 1981, three more states. Yet, despite these early state changes, no state actually conducted a lethal injection execution until 1982. That year, Texas executed Charles Brooks, the first lethal injection in this country and perhaps the world, in a botched procedure<sup>107</sup> that would be an omen for decades to come, up to 2025 (and most likely beyond). Lethal injection would become not only the most widely used execution method—eventually adopted by all death penalty states—but seemingly among the most problematic and botched,<sup>108</sup> an outcome that could have been predicted considering the lack of medical and scientific studies of lethal injection on human beings.<sup>109</sup>

From 1977 to 2009, all states (with occasional exceptions) used the same three-drug lethal injection protocol that A.J. Chapman, M.D., and a politician created in just several hours, which consisted of (1) sodium thiopental, a barbiturate anesthetic intended to induce deep unconsciousness; (2) pancuronium bromide, a muscle relaxant able to paralyze all skeletal muscles and the diaphragm, thereby causing suffocation; and (3) potassium chloride, a toxin that results in irreversible cardiac arrest.<sup>110</sup> While most of the earlier Eighth Amendment challenges to the constitutionality of lethal injection focused on the formula's use of the second drug, the paralytic pancuronium bromide, courts eventually agreed that if an inmate did not receive a sufficient amount of sodium thiopental and remained conscious, it would be unconstitutional for executioners to inject the second and third drugs; the major concern was that the paralytic would prevent inmates from communicating their pain and suffering.<sup>111</sup>

Beginning in 2006, the accumulated effects of lethal injection litigation became so influential<sup>112</sup> they led to the Supreme Court's first-ever constitutional review of

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<sup>105</sup> See *Constitutional*, *supra* note 1, at 374 n.315; *Medicine*, *supra* note 32, at 76.

<sup>106</sup> For excellent analyses of the country's adoption of lethal injection and its repercussions, see generally CORINNA BARRETT LAIN, *SECRETS OF THE KILLING STATE: THE UNTOLD STORY OF LETHAL INJECTION* (2025); AUSTIN SARAT, *LETHAL INJECTION AND THE FALSE PROMISE OF HUMANE EXECUTION* (2022).

<sup>107</sup> See *Constitutional*, *supra* note 1, at 375; *Medicine*, *supra* note 32, at 79.

<sup>108</sup> *Medicine*, *supra* note 32, at 93; *Chaos*, *supra* note 32. For informative and detailed discussions of the botches, see generally LAIN, *supra* note 106.

<sup>109</sup> See *Medicine*, *supra* note 32, at 59.

<sup>110</sup> See *Medicine*, *supra* note 32, at 65–69.

<sup>111</sup> See generally *Chaos*, *supra* note 32.

<sup>112</sup> See Eric Berger, *Courts, Culture, and the Lethal Injection Stalemate*, 62 WM. & MARY L. REV. 1, 1 (2020); see generally *Constitutional*, *supra* note 1; *Legislatures*, *supra* note 1; Deborah W. Denno, *Death Bed*, 124 TRIQUARTERLY J. 141 (2006) [hereinafter *Death Bed*]; *Medicine*, *supra* note 32; *Chaos*, *supra* note 32; *Future*, *supra* note 11.

any execution method.<sup>113</sup> In 2008, in *Baze v. Rees*,<sup>114</sup> the Court upheld Kentucky’s lethal injection protocol, determining that defendants had failed to demonstrate that the State’s three-drug approach posed a “substantial” or “objectively intolerable” risk of “serious harm”<sup>115</sup> compared to “known and available alternatives.”<sup>116</sup>

Yet, just two years later, *Baze* would be followed by a circumstance no one could have predicted—a nationwide shortage of the first drug, sodium thiopental—and the spawning of wildly unforeseeable efforts by states around the country searching for substitute drugs and encountering roadblocks at every turn.<sup>117</sup> This fervent and complicated process lasted well over the next decade and a half.<sup>118</sup> Indeed, states’ desperate and secretive efforts to use and switch drugs, including compounded medications, have fueled risks and recklessness among executioners unfamiliar with the consequences. One of the most controversial of the drugs was midazolam, a substitute for sodium thiopental, and all too frequently linked to troublesome executions in which inmates were not properly rendered unconscious.<sup>119</sup>

In 2015, in *Glossip v. Gross*,<sup>120</sup> the Court assessed the constitutionality of Oklahoma’s three-drug protocol, which used midazolam as a substitute for sodium thiopental, a mere seven years after the *Baze* Court had upheld the original three-drug protocol that incorporated sodium thiopental. In *Glossip*, the Court held that inmates failed to show that midazolam created “a substantial risk of severe pain” when used in Oklahoma’s protocol.<sup>121</sup> Just as controversially, the Court further complicated the *Baze* standard, establishing a more rigorous two-pronged test instead: plaintiffs must prove that the planned method of execution poses “a substantial risk of severe pain” and “identify a known and available alternative method of execution that entails a lesser risk of pain.”<sup>122</sup> The *Glossip* test was, to many, daunting, pushing inmates to propose other execution techniques the state might use that would substantially reduce their risks of pain and suffering compared to the state’s intended method. Likewise, states’ secrecy about their execution processes would make such a test nearly impossible to pass.<sup>123</sup>

<sup>113</sup> See *Death Bed*, *supra* note 112.

<sup>114</sup> *Baze v. Rees*, 553 U.S. 35, 41 (2008).

<sup>115</sup> *Id.* at 50.

<sup>116</sup> *Id.* at 61.

<sup>117</sup> See *Chaos*, *supra* note 32, at 1360–66.

<sup>118</sup> See *id.* at 1360–66; see generally *Future*, *supra* note 11.

<sup>119</sup> See *Chaos*, *supra* note 32, at 1357; *Future*, *supra* note 11, at 227; see generally *Firing Squad*, *supra* note 12; SARAT, *supra* note 106; Austin Sarat, Theo Dassin & Aidan Orr, *A Dark Shadow: The Intensification and Expansion of Lethal Drug Secrecy*, 12 BRIT. J. AM. LEGAL STUDS. 1 (2023).

<sup>120</sup> *Glossip v. Gross*, 576 U.S. 863 (2015).

<sup>121</sup> *Id.* at 867.

<sup>122</sup> *Id.*

<sup>123</sup> See William W. Berry III & Meghan J. Ryan, *Cruel Techniques, Unusual Secrets*, 78 OHIO STATE L.J. 403, 423 (2017); *Chaos*, *supra* note 32, at 1376–78; *Firing Squad*, *supra* note 12, at 771–

Four years later, the Court encountered a different kind of lethal injection challenge, this time in Missouri, involving a circumstance that concerned one inmate's medical vulnerabilities rather than a challenge to the state's entire lethal injection protocol. In *Bucklew v. Precythe*,<sup>124</sup> the Court rejected inmate Bucklew's as-applied challenge to Missouri's one-drug pentobarbital protocol in which Bucklew claimed that Missouri's protocol would be unconstitutional when used on him specifically because of his unusual medical condition. According to Bucklew, blood-filled tumors in his head, neck, and throat would rupture and cause him to suffer "excruciating" pain when injected by Missouri's protocol.<sup>125</sup> In addition, the state's execution team's training and qualifications were flawed, particularly in their ability to accommodate his condition. Yet, the Court held that Bucklew did not meet his burden under the Court's revised Eighth Amendment standard,<sup>126</sup> thereby demonstrating the difficulties of as applied challenges.

All three lethal injection cases—*Baze*, *Glossip*, and *Bucklew*—did not convince the Court that particular lethal injection protocols are unconstitutional.<sup>127</sup> Yet lethal injection challenges have made inroads in other ways, given the massive variability of the protocols and continuing incompetence of the executioners.<sup>128</sup> These circumstances are all the more compelling when considering lethal injection's "botch rate." A "botch" can result when an execution does not proceed as intended—for example, executioners fail to find a vein to administer the drugs, puncture an inmate multiple times and in different places to discover an access point, mix up drugs, administer incorrect drugs and dosages, and create an array of additional problems that cause delays, pain, and agony.<sup>129</sup>

"Botch rates" can be measured in terms of the number of times executions are "botched" during a particular period compared to the number of times they proceed as intended. Yet, this statistic is challenging for two reasons. First, the botch rates of all execution methods, including lethal injection, have been underestimated because researchers have rarely possessed complete information on a sample or

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72; see generally Alexandra L. Klein, *Nondelegating Death*, 81 OHIO STATE L.J. 923 (2020); *Future*, supra note 11.

<sup>124</sup> *Bucklew v. Precythe*, 587 U.S. 119 (2019).

<sup>125</sup> *Id.* at 126.

<sup>126</sup> See *id.* at 119.

<sup>127</sup> For an insightful discussion of this trilogy of cases and their roadblocks, see generally Alexandra L. Klein, *The Eighth Amendment's Paper Tiger: Pain, Executions, and the Cruel and Unusual Punishment Clause*, 17 NE. UNIV. L. REV. 1 (2025).

<sup>128</sup> See *Chaos*, supra note 32, at 1360–66; *Firing Squad*, supra note 12, at 764–65; *Future*, supra note 11; *Lethal Injection Cases*, DEATH PENALTY INFO. CTR., <https://deathpenaltyinfo.org/stories/lethal-injection-cases> [<https://perma.cc/YA98-E8EN>] (last visited July 5, 2025).

<sup>129</sup> See *Constitutional*, supra note 1, at 338 n.110 (defining what a "botch" is); *Legislatures*, supra note 1, at 100–05; *Death Bed*, supra note 112, at 144–46; *Medicine*, supra note 32, at 92; *Chaos*, supra note 32, at 1335–36; *Firing Squad*, supra note 12, at 764–66; see generally AUSTIN SARAT, GRUESOME SPECTACLES: BOTCHED EXECUTIONS AND AMERICA'S DEATH PENALTY (2014); SARAT, supra note 106.

universe of cases. Second, the number of witnesses is limited because inmates and their lawyers often rely on journalists or family members to attend an execution, and these individuals may not always be available. This circumstance creates three additional types of impediments to documenting a botch even if witnesses are present: (1) journalists and others may not always report if a botch occurred (for example, they may not have time or the botch may not be a priority), (2) they may not have been aware if a botch does occur (especially if an inmate has been paralyzed during a lethal injection), or (3) they may have had their viewing curtailed by departments of corrections that can often prohibit a full viewing by pulling a curtain around the inmate.<sup>130</sup>

The reports of more defined samples of inmates whose executions have been studied more intently may be more reliable for creating a botch rate. For example, in 2006, in *Morales v. Hickman*,<sup>131</sup> a California federal district court took seriously the following information when evaluating the state's use of lethal injection: of the eleven inmates lethally injected in California, six of those inmates—or fifty-five percent—may have been conscious and tormented by the state's three-drug regimen, based on evidence from execution logs. This study's medical scrutiny of all eleven lethally injected inmates in California (a universe of cases) enabled a more reliable and systematic botch rate because all executions were examined and all in the same way.<sup>132</sup>

The Death Penalty Information Center's 2022 year-end report was also systematic in its examination of all executions for that year, and its botch rate was startling.<sup>133</sup> As the report noted, over one-third (thirty-five percent) of the twenty attempts at lethal injection in that year visibly failed for all the same reasons they have faltered since this country's first lethal injection execution four decades ago: executioner incompetence, inappropriate use of torturous drugs, and defects in lethal injection protocols, among a host of other factors.<sup>134</sup>

Another underestimated measure of lethal injection's increasing botch rate is the number of executions that inmates have survived—what this article calls “execution survivors.” While there was only one known electrocution execution that failed the first time—the attempted electrocution of Willie Francis in 1947<sup>135</sup>—there

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<sup>130</sup> See *Legislatures*, *supra* note 1, at 126–28 (discussing the foundational cases involving media challenges of departments of corrections concerning limited visibility of lethal injection executions).

<sup>131</sup> *Morales v. Hickman*, 415 F. Supp. 2d 1037 (N.D. Cal. 2006). While *Morales* mentions execution mishaps “in at least six out of thirteen executions by lethal injection in California,” *id.* at 1045, only eleven executions were conducted by lethal injection (the other two were by lethal gas); see also *Morales v. Tilton*, 465 F. Supp. 2d 972, 975 n.3 (N.D. Cal. 2006) (“In fact, there have been only eleven executions by lethal injection in California.”).

<sup>132</sup> See *Medicine*, *supra* note 32, at 51.

<sup>133</sup> See DEATH PENALTY INFO. CTR., THE DEATH PENALTY IN 2022: YEAR END REPORT 2 (2022), <https://dpic-cdn.org/production/documents/reports/year-end/Year-End-Report-2022.pdf?dm=1683576592> [<https://perma.cc/T66Z-6H2G>].

<sup>134</sup> *Id.*

<sup>135</sup> See DEATH PENALTY STORIES, *supra* note 63.

are six such lethal injection attempts, all following the Court's approval of lethal injection in *Baze v. Rees*.<sup>136</sup> All six execution attempts were horrifically botched: Romell Broom in Ohio in 2009; Alva Campbell in Ohio in 2017; Doyle Lee Hamm in Alabama in 2018; Alan Eugene Miller in Alabama in 2022; Kenneth Eugene Smith in Alabama in 2022; and Thomas Creech in Idaho in 2024. In addition, all inmates were subject to numerous punctures in different parts of their bodies caused by executioners' incompetent efforts to find a viable entry point. Such failures resulted in prolonged periods of time, stress, pain, injury, bruising, and fear.<sup>137</sup> Notably, three of the six execution survivors were inmates in Alabama.

The vast numbers of lethal injection botches have, since 1982, revealed daunting executioner ignorance and department of corrections indifference, ranging from the 2014 torturous and chaotic execution of Clayton Lockett in Oklahoma to Alabama's 2022 execution of Joe Nathan James, Jr., described as a scene of "carnage."<sup>138</sup> As of this writing, the latest example is Tennessee's 2025 disastrous execution of Byron Black, who all seven reporter-witnesses said suffered from pain and distress, purportedly from a heart device his attorneys requested be removed because it might shock him repeatedly in an attempt to keep him alive.<sup>139</sup> The nature and extent of the botches in recent years, in addition to the historically new group of execution survivors, suggest that lethal injection debacles have only become crueler and more egregious with time, aggravated all the more by states' efforts to adopt quick and sloppy fixes such as new or different drugs.

Increasingly, some states have enabled inmates to choose other execution methods that are constitutional, even if they still may be problematic (such as electrocution), or a new method, such as nitrogen hypoxia.<sup>140</sup> For example, on March 7, 2025, South Carolina executed an inmate for the first time using the firing squad, the method the inmate, Brad Sigmon, selected because he so distrusted the other choices of electrocution or lethal injection.<sup>141</sup> As Mr. Sigmon's attorney

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<sup>136</sup> *Baze v. Rees*, 553 U.S. 35, 37 (2008).

<sup>137</sup> See *As Lethal Injection Turns Forty, States Botch a Record Number of Executions*, DEATH PENALTY INFO. CTR. (Dec. 7, 2022), <https://deathpenaltyinfo.org/news/as-lethal-injection-turns-forty-states-botch-a-record-number-of-executions> [<https://perma.cc/73D6-ADRM>]; *Botched Executions*, *supra* note 76.

<sup>138</sup> *Id.*; *Private Autopsy Documents 'Carnage,' Experienced by Alabama Death-Row Prisoner Nathan James During Longest Botched Lethal-Injection Execution in History*, DEATH PENALTY INFO. CTR. (Mar. 14, 2025), <https://deathpenaltyinfo.org/private-autopsy-documents-carnage-experienced-by-alabama-death-row-prisoner-joe-nathan-james-during-longest-botched-lethal-injection-execution-in-history> [<https://perma.cc/35AP-4S8M>].

<sup>139</sup> Byron Black's execution on August 5, 2025, is being investigated and an autopsy will be conducted to determine the exact cause of his pain. See Emily Cochrane, *Tennessee Inmate Executed Despite Ethical Health Concerns*, N.Y. TIMES (Aug. 5, 2025), <https://www.nytimes.com/2025/08/05/us/politics/tennessee-execution-heart-implant.html> [<https://perma.cc/3EJ5-EC2Z>].

<sup>140</sup> See *supra* tbl. 1; see generally *Future*, *supra* note 11.

<sup>141</sup> Eduardo Medina, *South Carolina Executes Inmate by Firing Squad*, N.Y. TIMES (Mar. 7, 2025), <https://www.nytimes.com/2025/03/07/us/south-carolina-firing-squad-execution.html> [<https://perma.cc/3YYK-DG8X>].

explained, “the firing squad is what is left, given what [Mr. Sigmon] knows about the electric chair, and what he doesn’t know about lethal injection” because officials were unable to answer his questions about it.<sup>142</sup> Justice Sonia Sotomayor, while commenting on *Glossip v. Gross*’s<sup>143</sup> “perverse requirement” that inmates offer an alternative execution method if the state’s principal method violates the Eighth Amendment, also expressed the viewpoint that the firing squad would be the better choice over other methods. However, as 2025 executions have now proven, this method has its own drawbacks.

### E. *The Firing Squad*

Next to hanging, the firing squad is the oldest of the six execution methods, having been used in this country’s first-ever execution, that of George Campbell in 1608. While over time, the military conducted a substantial number of shooting executions, firing squads have also executed a total of 146 civilians, including those of Brad Sigmon and Mikal Mahdi.<sup>144</sup>

Five states—Idaho, Oklahoma, Mississippi, South Carolina, and Utah—currently authorize shooting executions in some capacity, the largest such number documented at least since 1888, when New York first enacted electrocution.<sup>145</sup> Since 1976, there have been five firing squad executions in the United States, the first three only in Utah: Gary Gilmore in 1977, Albert Lee Taylor in 1995, and Ronnie Lee Gardner in 2010.<sup>146</sup> Currently, there are two more in South Carolina, Brad Sigmon

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<sup>142</sup> *Id.*

<sup>143</sup> *Glossip v. Gross*, 576 U.S. 863, 946 (2015) (Sotomayor, J., dissenting).

<sup>144</sup> See *supra* notes 129–130 and accompanying text; see also *Firing Squad*, *supra* note 12, at 778–79; *Execution Database*, *supra* note 83; Jacey Fortin, *U.S. Firing Squad Executions Are Rare, but Their History Is Long*, N.Y. TIMES (Mar. 7, 2025), [https://www.nytimes.com/2025/02/21/us/firing-squad-executions-us.html#:~:text=During%20the%20Civil%20War%2C%20both,that%20way%20in%20some%20states](https://www.nytimes.com/2025/02/21/us/firing-squad-executions-us.html#:~:text=During%20the%20Civil%20War%2C%20both,that%20way%20in%20some%20states.). [https://perma.cc/4ZG5-TLC9]; Abigail Brooks, Erik Ortiz & Tim Stelloh, *South Carolina Kills Death-Row Prisoner in State’s First Firing Squad Execution*, NBC NEWS (Mar. 7, 2025, at 7:20 PM EST), <https://www.nbcnews.com/news/us-news/south-carolina-set-execute-brad-sigmon-firing-squad-rcna194955> [https://perma.cc/Q7Q4-HFCC]; Skylar Laird, *SC Executes Second Death Row Inmate by Firing Squad*, S.C. DAILY GAZETTE (Apr. 11, 2025, at 12:57 PM), <https://scdailygazette.com/2025/04/11/u-s-supreme-court-declines-to-halt-scs-second-firing-squad-execution/> [https://perma.cc/S5GC-W63K].

<sup>145</sup> Of those five states, Idaho has also elected to have firing squad be the primary method of execution as of July 2026. See *supra* tbl. 1; see also *Engineering*, *supra* note 1, at 573; *Constitutional*, *supra* note 1, at 371; *Future*, *supra* note 11, at 230.

<sup>146</sup> See *Firing Squad*, *supra* note 12, at 788; *Execution Database*, *supra* note 83.

in 2025,<sup>147</sup> and Mikal Mahdi in 2025,<sup>148</sup> with the expectation that more executions will follow.<sup>149</sup>

The limited number of modern firing squad executions hampers the extent to which information is available about them; yet, as Sigmon’s attorney indicated, there was more detail about South Carolina’s firing squad than was ever distributed about their lethal injection protocol. The protocol followed in South Carolina is not all that different on the surface than the one used in Utah for Ronnie Lee Gardner in 2010.<sup>150</sup> According to news sources, Sigmon “was strapped to a specially made chair and had a hood over his head while three volunteer corrections staffers aimed loaded rifles at his heart and fired off live rounds.”<sup>151</sup> The firing squad chair was in the corner of the same room as the state’s electric chair, which, the South Carolina Department of Corrections explained, could not be put elsewhere.<sup>152</sup> Accordingly, the shooters stood behind a wall fifteen feet from Sigmon, all with loaded rifles. A member of the execution team placed a “small aim point” over Sigmon’s heart, and, after the warden read the execution order, the team fired. Witnesses could view Sigmon’s “right-side profile” behind bullet-resistant glass.<sup>153</sup>

Sigmon’s attorney described his death as “horrifying and violent,” yet such terms could also be applied to a botched lethal injection execution, which can often require more than two hours to finalize, assuming the inmate does not survive.<sup>154</sup> Indeed, according to a wide range of commentators, the firing squad appears to be the least inhumane execution, if for no other reason than the inmate’s death occurs more quickly than the other methods, even if the process is visually violent. In one test of the method’s effectiveness in 1938, when a condemned Utah inmate allowed doctors to conduct an electrocardiograph tracing during his execution, the doctors

<sup>147</sup> Fortin, *supra* note 144; Brooks, Ortiz & Stelloh, *supra* note 144.

<sup>148</sup> Chiara Eisner, *A Firing Squad Tried to Shoot a Prisoner in the Heart. They Missed, Autopsy Indicates*, NPR (May 8, 2025, at 2:41 PM ET), <https://www.npr.org/2025/05/08/nx-s1-5389846/firing-squad-south-carolina-death-penalty-execution> [<https://perma.cc/6RXB-CRMD>].

<sup>149</sup> Katie McKellar, *Utah Corrections Officials Say They’ll Be Ready to Execute Ralph Menzies by Firing Squad*, UTAH NEWS DISPATCH (July 14, 2025, at 2:51 PM), <https://utahnewsdispatch.com/2025/07/14/utah-corrections-officials-will-be-ready-to-execute-ralph-menzies-by-firing-squad/#:~:text=another%20murder%20charge.-,The%20chair%20used%20for%20firing%20squad%20execution%20is%20shown%20in,by%20firing%20squad%20traumatized%20him> [<https://perma.cc/YZK6-ZD75>]; *Upcoming Executions*, DEATH PENALTY INFO. CTR. (Sep. 2, 2025), <https://deathpenaltyinfo.org/executions/upcoming-executions> [<https://perma.cc/Z6ZJ-AWAB>].

<sup>150</sup> See *Firing Squad*, *supra* note 12, at 783–84.

<sup>151</sup> Amanda Lee Myers, *Firing Squad Executes Brad Keith Sigmon in South Carolina in “Bloody Spectacle,”* USA TODAY (Mar. 8, 2025, at 12:08 PM ET), <https://www.usatoday.com/story/news/nation/2025/03/07/firing-squad-execution-brad-keith-sigmon-south-carolina/81974007007/> [<https://perma.cc/Q7NV-8GSB>].

<sup>152</sup> *Id.*

<sup>153</sup> Lee Myers, *supra* note 151; CNN, *Firing Squad Execution Set for South Carolina Man, a First for the Palmetto State*, WJCL (Mar. 7, 2025, at 9:06 AM EST), <https://www.wjcl.com/article/brad-sigmon-death-row-firing-squad/64087283?utm> [<https://perma.cc/396T-XWV6>].

<sup>154</sup> Lee Myers, *supra* note 151.

determined the inmate's heartbeat stopped within seconds after the bullets entered his body. They pronounced him dead two minutes later.<sup>155</sup> British scientist Harold Hillman similarly concluded that execution by firing squad entailed among the lowest levels of potential pain compared to hanging, electrocution, lethal gas, or even beheading, which he classified as causing an inmate "severe" pain.<sup>156</sup>

Until the execution of Mikal Mahdi, the firing squad would have been considered the least likely method to be botched,<sup>157</sup> a status affirmed by the speed and certainty of Sigmon's death. Of the then 145 civilian firing squad executions recorded, only two—the executions of Wallace Wilkerson in 1877 and Eliseo Mares in 1951—reported any problems, and they involved executioners who killed recklessly or intentionally.<sup>158</sup> Likewise, there was general agreement that all three firing squad executions since 1976 have been swift, dignified, and consistent with protocol,<sup>159</sup> even though witnessing an individual being shot is incredibly disturbing. Yet all this changed with Mahdi's execution, which came closer to mirroring those of Wilkerson and Mares.

About a month after the execution of Brad Sigmon, South Carolina carried out its second firing squad execution, but this time with disastrous results. On April 11, 2025, Mikal Mahdi was placed in the same room as Brad Sigmon and faced the same protocol involving a three-person firing squad, strapped to a chair with a hood over his head and a target placed upon his chest.<sup>160</sup> As before, the three members of the firing squad took aim and fired at close range (fifteen feet away) through gunports in the execution chamber's walls.<sup>161</sup> While the South Carolina protocol required that the executioners aim for Mahdi's heart, quite shockingly, the state's autopsy report revealed that none of the three shots directly hit his heart.<sup>162</sup> According to Jonathan Ardan, M.D., who was commissioned by Mahdi's attorneys to examine the report, Mahdi's body had only two bullet wounds, both visually lower than the heart, that

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<sup>155</sup> See Phillips H. Lord, *Public Guinea Pig No. 1*, SCRIBNER'S COMMENTATOR, Mar. 1940, at 94, 94–98.

<sup>156</sup> Harold Hillman, *The Possible Pain Experienced During Execution by Different Methods*, 22 PERCEPTION 745, 745 (1993) ("It is difficult to know how much pain the person being executed [by firing squad] feels or for how long, because many of the signs of pain are obscured by the procedure or by physical restraints, but one can identify those steps which are likely to be painful.").

<sup>157</sup> See *Firing Squad*, *supra* note 12, at 787; see generally SARAT, *supra* note 129.

<sup>158</sup> See *Firing Squad*, *supra* note 12, at 787.

<sup>159</sup> *Id.* at 791.

<sup>160</sup> Laird, *supra* note 144.

<sup>161</sup> Ted Clifford, *S.C. Firing Squad 'Intended to Miss,' Cause Inmate 'Extreme Suffering,' Suit Says*, STATE (June 12, 2025, at 4:09 PM), <https://www.thestate.com/news/local/crime/article308216510.html> [<https://perma.cc/97YX-GCMS>].

<sup>162</sup> Eisner, *supra* note 148; Clifford, *supra* note 161. Mahdi's execution was a far cry from the execution of Sigmon, who made no sound, whose chest moved two or three times before going still, and whose autopsy revealed all three bullet wounds overlapping his heart. Mahdi's autopsy, in contrast, showed two separate bullet paths, neither of which completely destroyed the heart. Clifford, *supra* note 161.

hit Mahdi's other internal organs.<sup>163</sup> While the state suggested that two of the three shots together caused one of the gunshot wounds, other pathologists have disagreed with this determination, claiming it would be impossible for two independent bullets to enter the exact same place.<sup>164</sup> There remains no conclusive answer as to what happened to the third bullet, which never appeared to have entered Mahdi's body.<sup>165</sup>

There was strong evidence that Mahdi was in agony. Witnesses reported that he cried out and groaned before taking what appeared to be a final gasp eighty seconds after the guns were fired.<sup>166</sup> Dr. Arden also indicated that Mahdi "experienced excruciating conscious pain and suffering for about thirty to sixty seconds after he was shot."<sup>167</sup> Likewise, Mahdi's attorney explained, "We don't know what went wrong, but nothing about his execution was humane."<sup>168</sup> In light of Mahdi's torturous experience, attorneys submitted two filings with the South Carolina Supreme Court: (1) counsel for Mahdi filed a notice of a botched execution<sup>169</sup> and (2) an attorney representing other inmates filed a suit claiming, among other things, that the South Carolina firing squad intended to miss.<sup>170</sup>

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<sup>163</sup> Anumta Ali, *Lawyers Raise Concern as Autopsy Finds South Carolina's Second Firing Squad Execution May Have Been Botched*, DEATH PENALTY INFO. CTR. (May 15, 2025), <https://deathpenaltyinfo.org/news/lawyers-raise-concern-as-autopsy-finds-south-carolinas-second-firing-squad-execution-may-have-been-botched> [<https://perma.cc/5822-3VA8>]. Despite the autopsy report from the state pathology report which suggested that two bullets entered through one wound, a separate pathologist observed that the odds of that dual entry were "minuscule." The autopsy also indicated that none of the bullets directly hit Mahdi's heart. Mahdi's attorneys indicated that this was a "massive botch" in their filing to the South Carolina Supreme Court. *Id.*

<sup>164</sup> See Mikal D. Mahdi Autopsy Report, Exhibit A at 3, Mahdi v. Stirling, No. 2025-000491 (S.C. Apr. 14, 2025), <https://www.wsps.com/wp-content/uploads/sites/53/2025/05/Exhibit-A-Mikal-D.-Mahdi-Autopsy-Report.pdf> [<https://perma.cc/T4LG-P8YM>]

<sup>165</sup> *Id.*

<sup>166</sup> Eisner, *supra* note 148.

<sup>167</sup> *Id.*

<sup>168</sup> Viola Flowers, *S.C. Inmate's Firing Squad Execution Was 'Botched,' with Bullets Mostly Missing His Heart, Lawyers Say*, NBC NEWS (May 9, 2025, at 5:54 PM EDT), <https://www.nbcnews.com/news/us-news/south-carolina-inmates-firing-squad-execution-botched-bullets-mostly-m-rca205838> [<https://perma.cc/H5L8-R8X6>].

<sup>169</sup> See Status Report and Notice of Botched Execution, Mahdi v. Stirling, No. 2025-000491 (S.C. May 8, 2025), <https://static.foxnews.com/foxnews.com/content/uploads/2025/05/2025-05-08-status-report-re-botched-execution.pdf> [<https://perma.cc/5U5K-QVF6>] (arguing that the execution was a "massive botch").

<sup>170</sup> Clifford, *supra* note 161 (Lawyers representing another death row inmate, Stephen Stanko, scheduled to be executed by lethal injection in South Carolina are arguing that all three execution methods—lethal injection, electric chair, and firing squad—violate the protections against cruel and unusual punishment, noting specifically that the execution of Mikal Mahdi was botched and that the firing squad intentionally missed at such a close range.); Emergency Application for Stay of Execution to Preserve Jurisdiction at 16, Stanko v. South Carolina Dep't. Corr., No. 24A1231 (U.S. June 12, 2025), [https://www.supremecourt.gov/DocketPDF/24/24A1231/363053/20250612224033048\\_SCS-2025.06.12-stay.app.pdf](https://www.supremecourt.gov/DocketPDF/24/24A1231/363053/20250612224033048_SCS-2025.06.12-stay.app.pdf) [<https://perma.cc/FTF3-9HWF>] (In the complaint arguing for a stay of execution, Counsel for Stanko stated, "This available evidence reflects that those responsible for conducting the Mahdi firing squad intended to miss the direct target...").

Even in light of the botched execution of Mikal Mahdi, Utah appears ready to join South Carolina in using the firing squad; when the time comes, the state will purportedly search for eight individuals to comprise their firing squad: a leader, five sharpshooters, and two alternates, all of whom must be law enforcement officers.<sup>171</sup> Historically, firing squads were a preferred method of execution in Utah, which houses a substantial Mormon population. According to early Mormon teachings, to make amends for an eternal sin, the kind that death row inmates have committed, the sinner should be killed in a manner that sheds blood as a means of atonement.<sup>172</sup> With the additional members in the firing squad and the procedures that Utah has in place to test the applicants for the firing squad, the state may make the botch that occurred with Mahdi's execution the exception rather than a "new normal" that we have seen with other execution methods.

Members of the Supreme Court with conflicting ideologies have also reinforced the firing squad's viability. While Justice Sotomayor's dissent in *Glossip v. Gross* supported the firing squad's humaneness relative to other methods, the Justice also emphasized how much the firing squad meshed with *Glossip*'s three-part test for alternative methods, specifically, that the firing squad is "known and available,"<sup>173</sup> "significantly more reliable,"<sup>174</sup> and also "vastly preferable to an excruciatingly painful death hidden behind a veneer of medication."<sup>175</sup> Similarly, if witnesses could see behind lethal injection's "curtain," she said, they may conclude that the method is even more violent than the firing squad.<sup>176</sup> In *Arthur v. Dunn*, Justice Sotomayor also noted in her dissent that "historically, the firing squad has yielded significantly fewer botched executions."<sup>177</sup>

Justice Brett Kavanaugh's concurrence in *Bucklew v. Precythe* noted that all the Justices agreed that the alternative method "need not be authorized under current state law"; inmates can propose any constitutional method as an alternative, even one that their own state has not adopted.<sup>178</sup> While Justice Kavanaugh did not "prejudge the question whether the firing squad, or any other alternative method of execution would be a feasible and readily implemented alternative for every State," he did stress that an acceptable alternative method should be available.<sup>179</sup> In turn, Alex Kozinski, former Chief Judge of the Ninth Circuit Court of Appeals, was

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<sup>171</sup> Martha Harris, *Utah Corrections Prepares for Firing Squad Execution of Ralph Menzies*, KUER (July 14, 2025, at 4:14 PM MDT), <https://www.kuer.org/news/2025-07-14/utah-corrections-prepares-for-firing-squad-execution-of-ralph-menzies> [<https://perma.cc/YQT5-ETSR>].

<sup>172</sup> *Constitutional*, supra note 1, at 395 (explaining the concept of blood atonement in early Mormon teachings).

<sup>173</sup> *Glossip v. Gross*, 576 U.S. 863, 880, 976 (2015).

<sup>174</sup> *Id.* at 976.

<sup>175</sup> *Id.*

<sup>176</sup> *Id.*

<sup>177</sup> *Arthur v. Dunn*, 580 U.S. 1141, 1153 (2017) (Sotomayor, J., dissenting).

<sup>178</sup> See *Bucklew v. Precythe*, 587 U.S. 119, 153 (2019) (Kavanaugh, J., concurring).

<sup>179</sup> *Id.*

among the first to suggest that the firing squad is the “most promising [method].”<sup>180</sup> As he explained, while the method “can be messy” because “we are shedding human blood,”<sup>181</sup> lethal injection can also be messy and bloody in ways that medical experts, lawyers, and scholars have increasingly documented.<sup>182</sup>

For sure, the firing squad meets the practical limitations lethal injection could never fulfill: there are endless numbers of weapons, ammunition, and trained shooters in this country.<sup>183</sup> Yet, the method’s problem lies with its antiquated image and violent Wild West reputation. Generally, the public considers the firing squad more barbarous than lethal injection, and that reputational hurdle may be the method’s biggest obstacle. Likewise, human error or intentional misconduct, previously considered relics of the past, are now an added concern in light of Mahdi’s debacle. That said, states like Idaho and Utah, which at different times have wavered on their allegiance to the firing squad, have now firmly reembraced it.<sup>184</sup> South Carolina’s adoption of the firing squad in 2021 appeared to continue the trajectory, with the South Carolina Supreme Court overturning a trial court’s holding that both the firing squad and electrocution violated the South Carolina State constitution and its prohibition on cruel, corporal, or unusual punishments.<sup>185</sup>

Therefore, irrespective of Mahdi’s botch, the firing squad may still be the most viable method for execution, assuming that states such as Utah are taking greater protective measures. Indeed, despite the botch, Justice Sotomayor still suggests that execution by firing squad may be a better alternative to the other available methods.<sup>186</sup>

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<sup>180</sup> See *Wood v. Ryan*, 759 F.3d 1076, 1103 (9th Cir. 2014) (Kozinski, C.J., dissenting from denial of rehearing *en banc*) (“The firing squad strikes me as the most promising [method of execution].”).

<sup>181</sup> *Id.*

<sup>182</sup> See generally LAIN, *supra* note 106; *Botched Executions*, *supra* note 76; *Legislatures*, *supra* note 1; *Medicine*, *supra* note 32; *Future*, *supra* note 11; *Execution Database*, *supra* note 83.

<sup>183</sup> See *Firing Squad*, *supra* note 12, at 777–78.

<sup>184</sup> While Idaho legalized the method in 1982, the state never used it and removed it as an option in 2009 (after *Baze v. Rees*), only to bring it back again in 2023 in case lethal injection drugs were not available. Likewise, the Utah legislature voted to eliminate the method in 2004 but voted it back as a secondary method in 2015. See *Firing Squad*, *supra* note 12, at 780–81; *supra* tbl. 1.

<sup>185</sup> See *Owens v. Stirling*, 882 S.E.2d 858, 859 (2023); Steve Garrison, *South Carolina Court Weighs Death Row Inmates’ Challenge to Firing Squad, Electric Chair*, COURTHOUSE NEWS SERV. (Feb. 6, 2024), <https://www.courthousenews.com/south-carolina-court-weighs-death-row-inmates-challenge-to-firing-squad-electric-chair/> [<https://perma.cc/DSK8-TMSV>].

<sup>186</sup> See *Boyd v. Hamm*, No. 25A457 (25-5928) slip op. at 8 (U.S. Oct. 23, 2025) (Sotomayor, J., dissenting). Justice Sotomayor, in her dissent to the denial of Boyd’s stay of execution, compared the pains suffered by inmates between execution by nitrogen hypoxia and firing squad, arguing that while the immediate physical pain may be greater with the firing squad, the person would be rendered unconscious quickly; meanwhile the several minutes that a person is conscious during a nitrogen hypoxia execution would superadd psychological pain. *Id.* “There is a significant constitutional difference between three to six seconds of physical pain and terror and two to seven minutes of conscious suffocation with its associated psychological pain and terror.” *Id.*

These developments and evidence raise a key question: with the resurgence of the firing squad, why would a state ever use nitrogen hypoxia? The firing squad has the historical foundation and current potential to avoid future botches. Why are the states considering a wholly untested method devoid of scientific or cultural anchoring? The following section discusses the “perfect storm” of factors that may have led to nitrogen hypoxia’s creation and its future implications.

#### F. Nitrogen Hypoxia

There are several perfect-storm factors fueling the creation of nitrogen hypoxia, especially in Alabama, which first implemented the method. First, Alabama was desperate to switch to a new method of execution because it had recently experienced the greatest number of botched executions of any state in modern times. Three of the six lethal injection survivors—fifty percent—were Alabama inmates with attempted executions in close succession. Add to that number the private autopsy results for Joe Nathan James, the Alabama death row prisoner who endured in 2022 the “longest botched lethal injection execution in history,”<sup>187</sup> and Alabama’s Department of Corrections was facing relentless criticism for its incompetence. Second, unlike preceding methods, nitrogen hypoxia has no cultural mooring or socio-scientific foundation. It was not inherited from another country (like hanging), or part of an age of discovery (like electrocution), derived from a world war (like lethal gas), or even the product of a politician’s recommendation based on practices for humanely euthanizing animals (lethal injection). It seemingly came out of nowhere to fulfill an immediate need to execute, devoid of any current knowledge or data about the human body. Nitrogen hypoxia is the result of states dangerously grasping for whatever may be in “the kitchen” to shift from the shelter of incompetence they have created to perpetuate the death penalty’s existence.<sup>188</sup>

##### 1. Backdrop

Since 2015, five states—Alabama (in 2018), Arkansas (in 2025), Louisiana (in 2024), Mississippi (in 2017), and Oklahoma (in 2015)—have adopted nitrogen hypoxia as an alternative to lethal injection because of their challenges in acquiring lethal injection drugs and conducting executions. Alabama is the only state in which an inmate can “affirmatively choose” nitrogen hypoxia; in Louisiana, the Secretary of the Department of Public Safety and Corrections makes the choice and in Arkansas, the Director of the Department of Corrections makes the choice. In contrast, Mississippi and Oklahoma allow this new method only as a substitute if lethal injection is rendered unconstitutional or “otherwise unavailable.”<sup>189</sup>

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<sup>187</sup> *Private Autopsy Documents ‘Carnage,’ supra* note 138.

<sup>188</sup> For an insightful and convincing analysis of the cruelty of nitrogen hypoxia, *see generally* Berry, *supra* note 31.

<sup>189</sup> *See supra* tbl. 1.

No jurisdiction in the world (as far as is known) had executed anyone by nitrogen hypoxia until Alabama's execution of Kenneth Smith.<sup>190</sup> It appears that the method was first linked to Stuart Creque, a self-described technology consultant who proposed it thirty years ago in a two-page commentary in the *National Review*.<sup>191</sup> Creque described an execution technique derived from accidents during which individuals inhaled nitrogen, an odorless and invisible gas, and became unconscious immediately, with brain trauma and death following soon after.<sup>192</sup>

In 2015, Oklahoma—the birthplace of lethal injection—became the first state to adopt nitrogen hypoxia<sup>193</sup> when the legislature's overwhelming passage of its nitrogen hypoxia bill relied heavily on a sloppy, typo-ridden, unpublished and undated short paper by three arts and sciences faculty members at East Central University who lacked any medical or scientific credentials.<sup>194</sup> To provide further evidence, Oklahoma legislators also watched YouTube videos of teens inhaling helium, laughing, and passing out to better understand the gas's effects.<sup>195</sup> With these resources, the paper's authors concluded that nitrogen hypoxia would be “humane”<sup>196</sup> and “simple,”<sup>197</sup> while also ensuring “a quick and painless death of the offender.”<sup>198</sup> The method would not require licensed professionals to administer (an asset compared to lethal injection) and would be easily available.<sup>199</sup> With no further details, protocol, or foundation, Mississippi and Alabama adopted the untried method.

No protocol for nitrogen hypoxia existed until months after the Alabama Department of Corrections (ADOC) attempted to execute Smith by lethal injection on November 17, 2022.<sup>200</sup> During the execution attempt, Smith was strapped to a gurney for hours and subjected to one to two hours of repeated, painful attempts to

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<sup>190</sup> See Nicholas Bogel-Burroughs, Shaila Dewan & Anna Betts, ‘Textbook’ Execution or Botched One? Alabama Case Leaves Sides Divided., N.Y. TIMES (Jan. 26, 2024), [www.nytimes.com/2024/01/26/us/alabama-execution-kenneth-smith-nitrogen.html](http://www.nytimes.com/2024/01/26/us/alabama-execution-kenneth-smith-nitrogen.html) [<https://perma.cc/72XZ-ZEPW>].

<sup>191</sup> See Stuart A. Creque, *Killing with Kindness: Capital Punishment by Nitrogen Asphyxiation*, 47 NAT'L REV. 51 (1995).

<sup>192</sup> See *id.* at 51-5; *Future*, *supra* note 11, at 231–32.

<sup>193</sup> See *supra* tbl. 1.

<sup>194</sup> MICHAEL COPELAND, THOM PARR & CHRISTINE PAPAS, NITROGEN INDUCED HYPOXIA AS A FORM OF CAPITAL PUNISHMENT (2015), [https://dpic-cdn.org/production/legacy/Copeland%20Report\\_Nitrogen-Hypoxia.pdf](https://dpic-cdn.org/production/legacy/Copeland%20Report_Nitrogen-Hypoxia.pdf) [<https://perma.cc/6V23-NT3C>].

<sup>195</sup> See Eli Hager, *Why Oklahoma Plans to Execute People with Nitrogen*, MARSHALL PROJECT (Mar. 15, 2018, at 4:27 PM EDT), [www.themarshallproject.org/2018/03/15/why-oklahoma-plans-to-execute-people-with-nitrogen](http://www.themarshallproject.org/2018/03/15/why-oklahoma-plans-to-execute-people-with-nitrogen) [<https://perma.cc/94UQ-3FSS>].

<sup>196</sup> COPELAND, PARR & PAPAS, *supra* note 194, at 2.

<sup>197</sup> *Id.* at 3.

<sup>198</sup> *Id.* at 9.

<sup>199</sup> *Id.* at 10–11.

<sup>200</sup> See *Smith v. Hamm*, No. 2:22-cv-497, 2023 U.S. Dist. LEXIS 114853, at \*28 (M.D. Ala. July 5, 2023). For a detailed overview, see *Humaneness*, *supra* note 1, at 160.

establish intravenous (IV) access.<sup>201</sup> After prolonged and unsuccessful efforts, the ADOC aborted the execution, an outcome that caused Smith “extreme physical and psychological pain.”<sup>202</sup> Because it appeared increasingly likely that Smith would be executed again, despite his challenges, Smith selected nitrogen hypoxia to avoid another lethal injection; yet, he also contended that alternative methods, including the firing squad, could reduce the risk of experiencing severe and unnecessary pain.<sup>203</sup>

There are many procedural complexities in Smith’s case that are too intricate to describe here. In addition, it is clear that Smith and his attorneys were aware of and detailed the viable dangers he could experience, including the following: improper mask fit and potential dislodgement during the execution, risks of vomiting, the introduction of oxygen, failure to monitor pulse oximeters, and possible outcomes like a vegetative state, stroke, or painful suffocation.<sup>204</sup> Smith also argued that the Alabama execution protocol violated his First Amendment rights, specifically that the protocol requirement interfered with his ability to make an audible statement or pray during his execution.<sup>205</sup> For example, he claimed that the mask requirement could lead to issues such as dislodging the mask or increasing carbon dioxide levels, which would compromise his ability to speak or pray audibly.<sup>206</sup>

On August 23, 2023, nearly five years after Alabama adopted nitrogen hypoxia and a mere five months before Smith’s execution, the Alabama Department of Corrections published the execution procedures it had developed for the method.<sup>207</sup> Yet, criticisms of their vagueness pushed the ADOC to provide further information, which seemingly created additional conflict on how the execution would be performed.<sup>208</sup> Despite continuing litigation detailing the concerns over Alabama’s nitrogen hypoxia procedure and a persuasive dissent by three Supreme Court

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<sup>201</sup> Smith was strapped to the gurney for hours, leading to severe discomfort and circulation issues. He experienced severe physical pain and emotional distress caused by the trial-and-error methods of the execution team in regard to their attempts to establish IV access. Smith claimed that the team disregarded his pleas for relief. *See* Smith, 2023 U.S. Dist. LEXIS 114853, at \*1–2; *see also supra* note 2 and accompanying text.

<sup>202</sup> *Id.*

<sup>203</sup> *See* Smith v. Hamm, No. 2:23-cv-656, 2024 U.S. Dist. LEXIS 5071, at \*2, \*21–22 (M.D. Ala. Jan. 10, 2024).

<sup>204</sup> *Id.* at \*9–12.

<sup>205</sup> *Id.* at \*12.

<sup>206</sup> *Id.* at \*12–13.

<sup>207</sup> *See* Smith v. Hamm, No. 2:22-cv-497, 2022 U.S. Dist. LEXIS 188494, at \*4 (M.D. Ala. Oct. 16, 2022).

<sup>208</sup> Smith v. Hamm, 144 S. Ct. 414, 416 (2024) (Kagan, J., dissenting); Robert Hart, *U.S. Should Halt First Planned Execution by Nitrogen Gas, UN Experts Say*, FORBES (Jan. 3, 2024, at 10:51 AM EST), [www.forbes.com/sites/roberthart/2024/01/03/us-should-halt-first-planned-execution-by-nitrogen-gas-un-experts-say/?sh=6d546af36389](https://www.forbes.com/sites/roberthart/2024/01/03/us-should-halt-first-planned-execution-by-nitrogen-gas-un-experts-say/?sh=6d546af36389) [https://perma.cc/6XEJ-FADP].

justices, where the Court denied Smith’s application for a stay of execution, Alabama remained unmoved by the arguments.<sup>209</sup>

On January 25, 2024, with “[t]he world [...] watching,”<sup>210</sup> Smith’s execution rapidly descended into disaster. Rather than Smith quickly falling unconscious as the State had argued, his execution did not proceed as expected. Smith’s spiritual advisor depicted Smith’s prolonged and desperate gasping reaction to the nitrogen gas, stressing that the prison officials with him in the chamber “appeared ‘visibly surprised at how bad this thing went.’”<sup>211</sup> Witnesses agreed that Smith “remained conscious for several minutes” and was “gasping for air” for four minutes, during which time “he was convulsing, he was writhing, the gurney was shaking noticeably.”<sup>212</sup> According to one reporter, Smith “began thrashing against the straps” holding him down on the gurney, “his whole body and head violently jerking back and forth for several minutes.”<sup>213</sup> In contrast to some lethal injection executions that look serene only because the inmate is paralyzed and incapable of movement, the reporter emphasized, “there was no mistaking this for what it was.”<sup>214</sup> Even one of the murder victim’s sons, Mike Sennett, who wanted Smith dead, agreed that Smith’s execution was unexpectedly long and disturbing: “‘With all that struggling and jerking, and [Smith] trying to get off that table, more or less, it’s just something I don’t ever want to see again.’”<sup>215</sup> Sennett explained that it was hard for him to “get the violence of Mr. Smith’s last moments out of his mind.”<sup>216</sup>

Dr. Jonathan Groner’s analysis of Smith’s autopsy report confirms the extraordinary degree of violence Smith suffered,<sup>217</sup> noting, in summary, that the

<sup>209</sup> See *Smith*, 144 S. Ct. at 414 (Sotomayor, J., dissenting).

<sup>210</sup> *Id.* at 415.

<sup>211</sup> See Bogel-Burroughs, Dewan & Betts, *supra* note 190.

<sup>212</sup> See Nicholas Bogel-Burroughs, *A Select Few Witnessed Alabama’s Nitrogen Execution. This is What They Saw*, N.Y. TIMES (Feb. 1, 2024), [www.nytimes.com/2024/02/01/us/alabama-nitrogen-execution-kenneth-smith-witnesses.html](https://www.nytimes.com/2024/02/01/us/alabama-nitrogen-execution-kenneth-smith-witnesses.html) [https://perma.cc/F965-VRVQ].

<sup>213</sup> See Bogel-Burroughs, Dewan & Betts, *supra* note 190.

<sup>214</sup> See Bogel-Burroughs, *supra* note 212.

<sup>215</sup> *Id.*

<sup>216</sup> *Id.*

<sup>217</sup> Memorandum from Jonathan I. Groner, M.D., Comments on Nitrogen Executions (Feb. 1, 2025) (on file with the author) (analyzing Kenneth Smith’s autopsy report). Dr. Groner is an Emeritus Professor of Clinical Surgery at The Ohio State University College of Medicine. He is also the author of *THE HIPPOCRATIC PARADOX: HOW THE HEALING PROFESSION KEPT THE DEATH PENALTY ALIVE OVER THE PAST TWO CENTURIES* (2026) (forthcoming). Dr. Groner reviewed Smith’s autopsy report and concluded as follows:

“An execution by nitrogen suffocation is torture for the inmate and agonizing for the witnesses. Although nitrogen is odorless and colorless, the inmate will be aware of his impending death because when the valve of the nitrogen cylinder is opened, the nitrogen flows at several liters per minute and then the inmate will likely feel a “blast” of air on his nose and mouth. Once the inert gas begins flowing into the tight-fitting face mask, the inmate can forestall his own death by holding his breath as long as possible. Prolonged breath holding is extremely difficult, and causes extreme distress. It may also cause

inmate would be “fully aware of the terror of his impending death. . . . Death will eventually occur, but it will take several minutes and a violent struggle to get there.”<sup>218</sup> Indeed, despite Alabama’s awareness of the torturous effects of nitrogen hypoxia and the fact that Smith had requested the firing squad, the state has executed other inmates the same way, with comparably disturbing results: Alan Eugene Miller (on September 26, 2024),<sup>219</sup> Carey Dale Grayson (on November 21, 2024),<sup>220</sup> Demetrius Frazier (on February 6, 2025),<sup>221</sup> Gregory Hunt (on June 10, 2025),<sup>222</sup> Geoffrey West (on September 25, 2025),<sup>223</sup> and Anthony Boyd (on October 23,

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negative pressure pulmonary edema (NPPE) as the inmate fights to keep his glottis closed as his diaphragm reflexively flattens to draw air into the lungs. This likely accounts for the fluid seen in the lungs in Mr. Smith’s autopsy. I have seen NPPE in patients with foreign body airway obstruction and it is a frightening sight: pink frothy fluid pours out of the airway, making oxygenation difficult. But once the inmate’s strength gives out, he will inhale a breath of air that contains only nitrogen and no oxygen. The gas has no anesthetic qualities (it is pure nitrogen, not nitrous oxide), so he will not be sedated, but will be fully aware of the terror of his impending death. The sudden drop in oxygen level in the blood can cause seizures, which can cause the inmate to shake violently. Death will eventually occur, but it will take several minutes and a violent struggle to get there.”

Memorandum from Jonathan I. Groner, M.D., Comments on Nitrogen Executions.

<sup>218</sup> *Id.*

<sup>219</sup> Michelle Del Rey, *Alan Miller Becomes the Second Death Row Inmate Executed by Nitrogen Hypoxia in the US*, MSN (Sep. 26, 2024), <https://www.msn.com/en-us/news/crime/alan-miller-becomes-the-second-death-row-inmate-executed-by-nitrogen-hypoxia-in-the-us/ar-AA1rho3Y?ocid=BingNewsVerp> [<https://perma.cc/KH6M-7WWX>] (Witnesses report that Miller struggled against the restraints, was shaking for about two minutes, and gasped on and off for an additional six minutes. The Alabama Attorney General stated that the execution “went as expected and without incident.”).

<sup>220</sup> Ralph Chapoco, *Alabama Executes Carey Dale Grayson for 1994 Murder of Vickie Deblieux*, ALA. REFLECTOR (Nov. 21, 2024, at 7:03 PM), <https://alabamareflector.com/2024/11/21/alabama-executes-carey-dale-grayson-for-1994-murder-of-vickie-deblieux/> [<https://perma.cc/TC88-NBAK>] (Witnesses reported labored and heavy breathing for approximately ten minutes and sudden muscle movements from Grayson.).

<sup>221</sup> Sarah Clifton, *Alabama Executes Demetrius Frazier by Nitrogen Gas for 1991 Murder*, SOONERS WIRE (Feb. 6, 2025, at 8:46 PM CT), <https://soonerswire.usatoday.com/story/news/local/alabama/2025/02/06/alabama-executes-demetrius-frazier-by-nitrogen-gas-for-1991-murder/78282236007/> [<https://perma.cc/RTW2-EVCA>] (After the gas began to be administered, Frazier’s breathing appeared to get heavier and then turned into gasps; he was shuddering, twitching and raised his leg before there was no perceptible movement approximately thirteen minutes after the gas started.).

<sup>222</sup> Kim Chandler, *Alabama Executes a Man by Nitrogen Gas for the Beating Death of a Woman in 1988*, ASSOC. PRESS (June 10, 2025, at 9:03 PM EDT), <https://apnews.com/article/execution-alabama-nitrogen-gas-1799b231099c2e260bee7f55b97fa31f> [<https://perma.cc/FNT8-WJG2>] (Hunt was observed shaking, raising his feet, letting out a moan and lifting his head, and then taking gasping breaths with long pauses in between before making no further discernible movements approximately ten minutes after the gas was started.).

<sup>223</sup> Kim Chandler, *Alabama Executes Man with Nitrogen Gas for 1997 Shooting Death of Store Clerk*, ASSOC. PRESS (Sep. 25, 2025, at 8:52 PM EST), <https://apnews.com/article/alabama-execution-nitrogen-abee4a788ad61f5b8d7cfe0d7afe992> [<https://perma.cc/4L42-5XJ4>] (Geoffrey West was described as struggling for breath during the first two minutes, rocking his head from side to side, his left fist curled up, and he appeared to slightly foam at the mouth before going still approximately ten

2025).<sup>224</sup> Louisiana has also joined Alabama with the execution of Jessie Hoffman, Jr., on March 18, 2025, Louisiana’s first nitrogen hypoxia execution.<sup>225</sup> Each of the decedents in these executions has exhibited similar behaviors as Kenneth Smith, including gasping and bodily movements for prolonged periods of time, usually exceeding ten minutes from when the gas was administered.<sup>226</sup>

The execution of Boyd proved to be the longest nitrogen hypoxia execution in this country’s history, taking more than thirty minutes.<sup>227</sup> Justice Sotomayor’s dissent to the denial of stay of execution detailed the executions leading up to Boyd’s, recounting that each execution involved the individual being conscious for several minutes, thrashing against restraints, gasping, and struggling.<sup>228</sup> Boyd’s execution was no different, likewise convulsing and gasping, but according to Boyd’s spiritual advisor, who was present at the execution, Boyd was trying to breathe and suffocated for nineteen minutes.<sup>229</sup> Alabama reporter Lee Hedgepeth described witnessing Boyd gasp for air over 200 times as Boyd’s eyes rolled back and his body strained and shuddered against his restraints.<sup>230</sup> Justice Sotomayor’s critique of nitrogen hypoxia in the dissent emphasizes the “superadded psychological torment” that a person undergoing this method of execution is required to endure, namely, that for several minutes the person is conscious and struggling with the “primal urge to breathe...while knowing that breathing will cause death . . .”<sup>231</sup>

Alabama’s (and now Louisiana’s and Arkansas’s) efforts to embrace a method different from lethal injection have certainly worked in their own way. The state need not concern itself with acquiring drugs or risking the survival of inmates. But

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minutes after the gas was administered. The Corrections Commissioner stated that the execution went “just as expected, according to protocol.”)

<sup>224</sup> Bogel-Burroughs, *supra* note 15 (witnesses described seeing Boyd convulse and heave for about fifteen minutes).

<sup>225</sup> Michelle Del Rey, *Louisiana Kills Jessie Hoffman in State’s First Nitrogen Gas Execution*, INDEP. (Mar. 19, 2025, at 7:36 EDT), <https://www.the-independent.com/news/world/americas/crime/jesse-hoffman-execution-nitrogen-gas-b2717577.html> [https://perma.cc/9D8W-L49T] (Louisiana prison’s chief of prison operations stated that Hoffman did move and shake briefly, similarly to accounts of prior nitrogen hypoxia executions. Department of Public Safety and Corrections Secretary Gary Westcott stated that execution “was flawless.”).

<sup>226</sup> Safia Samee Ali, *Louisiana Execution Recharges Debate on Death by Nitrogen Gas*, MSN (Mar. 8, 2025), <https://www.msn.com/en-us/news/other/louisiana-execution-recharges-debate-on-death-by-nitrogen-gas/ar-AA1AvMA6?ocid=BingNewsSerp> [https://perma.cc/99RM-69ML].

<sup>227</sup> Elizabeth Bruenig, *Tortured to Death in Alabama*, ATL. (Oct. 24, 2025), <https://www.theatlantic.com/ideas/archive/2025/10/death-penalty-alabama-torture/684680/> [https://perma.cc/QNZ5-V3BW].

<sup>228</sup> *Boyd v. Hamm*, No. 25A457 (25-5928) slip op. at 3–4 (U.S. Oct. 23, 2025) (Sotomayor, J., dissenting).

<sup>229</sup> Bogel-Burroughs, *supra* note 15.

<sup>230</sup> Bruenig, *supra* note 227.

<sup>231</sup> *Boyd v. Hamm*, No. 25A457 (25-5928) slip op. at 7 (U.S. Oct. 23, 2025) (Sotomayor, J., dissenting).

the approach presents a new conflict this country has not fully encountered, especially in light of the resurgence of the firing squad. As Elizabeth Bruenig noted in her article on the execution of Boyd, “[n]itrogen hypoxia is only the latest in this long-term quest for a humane style of execution.”<sup>232</sup> No matter what we think of the firing squad’s barbaric history and the violence it inflicts on the human body, it is substantially less inhumane than nitrogen hypoxia, which inflicts further violence. States’ adoption of methods that look less like obvious death seems to be far more appealing to the public, but it is science and reality that should dominate here.

#### CONCLUSION

The history of executions in the United States has taken many turns, leading to the six methods that states have adopted to carry them out. Yet, this country has entered a new age of execution strategies, moving away from lethal injection and either back to older techniques, such as electrocution and the firing squad, or forward to wholly new methods, such as nitrogen hypoxia, which lack any substantial cultural, scientific, or historical connection with U.S. society. However, despite all these changes, executions are becoming crueler, sloppier, and more reckless in society’s quest to continue the death penalty. With such ongoing experimentation, it appears that states are requiring less evidence of a method’s efficacy before implementing it. States are already blindly approving nitrogen gas and the firing squad to ensure the ongoing churn of executions, which raises a key question: how many botches must occur before states again turn their gaze to the next new method, one even crueler and more devoid of cultural foundation?

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<sup>232</sup> Bruenig, *supra* note 227.

