FROM GALLOWS TO GAS TO BULLETS: AMERICA'S DEATH CHAMBER AND THE CASE AGAINST NITROGEN HYPOXIA

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ABSTRACT

Nitrogen hypoxia has emerged as a new method of execution amid the decline of lethal injection, yet its adoption raises serious ethical, legal, and constitutional concerns. This Article examines the development of nitrogen hypoxia, evaluating its scientific basis, implementation in Alabama, Oklahoma, and Mississippi, and the risks it poses under the Eighth Amendment's prohibition against cruel and unusual punishment. Drawing on expert critiques and eyewitness accounts, particularly the controversial execution of Kenneth Smith, this Article reveals significant doubts about the method's reliability and humanity. The Article further explores whether nitrogen hypoxia represents a genuine advancement or merely a façade of humaneness in capital punishment. Finally, as a counterpoint, the Article evaluates the firing squad, highlighting its historical acceptance, legal viability, and empirical evidence supporting its effectiveness in minimizing pain and error. In light of modern challenges surrounding execution protocols, the Article argues that the firing squad may better satisfy constitutional and ethical standards than untested methods like nitrogen hypoxia.

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"Punishments are cruel when they involve torture or a lingering death; but the punishment of death is not cruel, within the meaning of that word as used in the Constitution. It implies there is something inhuman and barbarous, something more than the mere extinguishment of life."[2]

INTRODUCTION

Nitrogen hypoxia has emerged as a new alternative execution method in response to the challenges surrounding lethal injection. However, its use raises significant ethical, legal, and practical concerns, particularly regarding its reliability, humanity, and ability to meet the constitutional standards established by the Eighth Amendment. By analyzing its development, expert critiques, and real-world cases, this Article highlights the unresolved risks of suffering associated with nitrogen hypoxia. It then explores the firing squad as an alternative method to address these issues.

Part I of this Article provides a historical background on capital punishment, tracing its origins from ancient civilizations to modern practices. It then explores how execution methods evolved, analyzing how early public executions eventually gave way to private, centralized procedures as states sought methods perceived as less painful and more humane. This marked shift led to the adoption of various methods of execution, including hanging, the electric chair, gas chambers, and, eventually, lethal injection.

Part II of this Article discusses how lethal injections and subsequent challenges to states' concealment of this method served as a pathway to exploring nitrogen hypoxia as an alternative method. The introduction of lethal injection in the late 20th century marked a turning point, with its three-drug protocol touted as a medicalized and humane alternative. That image has since been undermined by ongoing controversies, such as botched executions, drug shortages, and opposition from medical professionals, which have cast doubt on its reliability and humanity. In response

2. In re Kemmler, 136 U.S. 436, 447 (1890).

to this mounting scrutiny, several states have implemented laws to protect the identities of execution team members and drug suppliers.

Part III of this Article next explores the emergence of nitrogen hypoxia as a controversial alternative to traditional execution methods. As of 2024, Alabama, Oklahoma, and Mississippi have approved its use. Supporters of nitrogen hypoxia argue that it is practical, easy to administer, and humane. However, experts in physiology have challenged these conclusions, emphasizing that the process may cause severe air hunger, intense discomfort, and prolonged suffering rather than the quick and painless death promised. Specifically, these concerns were underscored in the case of *Smith v. Hamm*,[3] where Kenneth Smith became the first person in U.S. history to be executed by nitrogen hypoxia.[4]

Part IV concludes by evaluating the firing squad as an alternative execution method, analyzing its legal framework under *Wilkerson v. Utah*.[5] Historical and medical evidence support the firing squad as a method that, when properly administered, results in swift death with minimal suffering. Data also confirms this, showing a 0% rate of botched executions compared to significantly higher rates for all other methods. While concerns remain over its overt violence, the transparency, efficiency, and consistent reliability of the firing squad make it not only a viable alternative but a demonstrably superior option to nitrogen hypoxia in the ongoing debate over execution methods.

I. BACKGROUND ON CAPITAL PUNISHMENT

This Part explores the historical development of capital punishment, tracing its transformation across civilizations and legal systems. The evolution of capital punishment spans from ancient retributive justice, as seen in Hammurabi's Code,[6] to culturally and religiously influenced methods in Greek and Persian societies, such as poison, stoning, and crucifixion.[7] English common law initially reserved the death penalty for a few felonies, but later expanded its use.[8] By the 19th century, however, reforms began to significantly reduce the number of capital offenses, ultimately leading to the abolition of the death penalty in the United Kingdom in 1965.[9] In the United States, capital punishment transitioned from public executions

3. 144 S. Ct. at 414, 414 (2024).
4. *Id*.
5. 99 U.S. 130, 135–36 (1879).
6. *The Code of Hammurabi*, YALE L. SCH., https://avalon.law.yale.edu/ancient/hamframe.asp (last visited Apr. 20, 2025).
7. *See* Donald H.J. Hermann, *Restorative Justice and Retributive Justice: An Opportunity for Cooperation or an Occasion for Conflict in the Search for Justice*, 16 SEATTLE J. FOR SOC. JUST. 71, 81 (2017); Josho Brouwers, *The Death Penalty in Athens*, ANCIENT WORLD MAG. (Apr. 6, 2018), https://www.ancientworldmagazine.com/articles/death-penalty-classical-athens/.
8. *See* Larry Holzwarth, *18 Examples of Crime and Punishment in the Ancient Persian Empire*, HIST. COLLECTION (Dec. 24, 2018), https://historycollection.com/18-examples-of-crime-and-punishment-in-the-ancient-persian-empire/; LOUIS J. PALMER, JR., THE DEATH PENALTY: AN AMERICAN CITIZEN'S GUIDE TO UNDERSTANDING FEDERAL AND STATE LAWS 8 (McFarland Publishing, 1998).
9. *See* JULIAN B. KNOWLES, THE ABOLITION OF THE DEATH PENALTY IN THE UNITED KINGDOM: HOW IT HAPPENED AND WHY IT STILL MATTERS 12 (2015).

to more regulated and private methods.[10] The South's heavy reliance on the death penalty, shaped by its history of slavery and racial violence, highlights regional disparities.[11]

A. Historical Practices of the Death Penalty: From Hammurabi to England

The death penalty has ancient roots, evolving over centuries from a principle of retributive justice to a modern penalty under growing scrutiny. One of the earliest origins of the death penalty, Law 196 of Hammurabi's Code, established that the punishment should match the crime.[12] It states: "*If a man puts out the eye of another man, his eye shall be put out. If he breaks another man's bone, his bone shall be broken.*"[13] While not explicitly enacted for murder,[14] Hammurabi's Code provided the death penalty for several other provisions.[15] For the ancient Greeks, the death penalty was reserved for the gravest offenses, such as intentional homicide.[16] Out of concern that direct killing would bring religious pollution, executions were carried out indirectly.[17] This approach prevented those enforcing the sentence from being seen as murderers.[18] Methods in ancient Greece included binding the condemned to a ground-fixed board to die from exposure and thirst, casting them into a bottomless pit, or administering poison, commonly hemlock.[19]

As we shift focus eastward to Persia, some punishments began with blinding and stripping the accused, followed by the particularly agonizing act of flaying.[20] Stoning was also practiced, with victims either pelted to death or crushed under gradually increasing weights placed on their torsos, leading to suffocation.[21] This method was commonly inflicted on servants or the poor.[22] Crucifixion typically involved securing the condemned's hands to an upright pole, resulting in a slow, excruciating death that could

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10. *See* CAROL S. STEIKER & JORDAN M. STEIKER, COURTING DEATH: THE SUPREME COURT AND CAPITAL PUNISHMENT 13 (Belknap Press, 2016); *see also*, John H. Blume, *Ghosts of Executions Past: A Case Study of Executions in South Carolina in the Pre-Furman Era*, 107 CORNELL L. REV. 1799, 1826 (2022).

11. *See* VICTOR STREIB, DEATH PENALTY IN A NUTSHELL 4–5 (West Acad. Publ'g, 3d ed. 2008); STEIKER, *supra* note 10, at 17.

12. Hermann, *supra* note 7.

13. *The Code of Hammurabi*, *supra* note 6.

14. *See generally id.*

15. For example, theft from a temple or palace (Law 6), kidnapping (Law 14), and adultery (Law 129) all carried the death penalty. *Id. See also* Tang Lu, *Analysis of the Death Penalty System in the Code of Hammurabi*, 5 J. SOCIO. & ETHNOLOGY 73 (2023).

16. Brouwers, *supra* note 7.

17. *Id.* The fear of religious pollution (*miasma*) drove the ancient Greeks to avoid direct forms of execution, such as hanging or decapitation, as these acts would have been seen as outright murder, tainting the executioner and others involved. *Id.* To mitigate this, they favored indirect methods like throwing individuals into a precipice, leaving them tied to die of exposure, or administering poison, such as hemlock. *Id.* These practices allowed the Greeks to carry out death sentences without the moral and religious consequences associated with personally taking a life. *Id.*

18. *Id.*

19. *Id.*

20. Holzwarth, *supra* note 8.

21. *Id.*

22. *Id.*

last days, with the body often left on display post-mortem to decompose publicly.[23] Impalement was also practiced, with various techniques selected based on the desired level of pain and suffering.[24] Each method was conducted publicly, serving to punish the individual and to instill fear and obedience among the population through visible displays of both physical and psychological torment.[25]

Under English common law, the key distinction between a convicted misdemeanant and a convicted felon lies in the severity of the punishment: a misdemeanant would not forfeit their life, whereas a felon could face capital punishment.[26] Furthermore, under common law, only a few offenses—"murder, arson, larceny, robbery, burglary, rape, treason, and petty treason"—were classified as felonies.[27] However, parliamentary statutes expanded the list to 263 felonies by 1822, all punishable by death.[28] The method of execution varied based on the crime.[29] Sodomy was punished by being buried alive,[30] while murder, rape, and arson were punishable by hanging.[31] Particularly heinous offenses could result in beheading, and convicted heretics were burned alive.[32] Yet, by the early 19th century, reforms, including the Punishment of Death Act of 1832, began to limit the use of capital punishment by reducing the number of capital crimes.[33] Between 1832 and 1861, offenses like shoplifting, forgery, and arson were removed.[34] By 1861, only four crimes—murder, treason, violent piracy, and arson in Royal Dockyards—carried the death penalty.[35] In effect, only murder remained a capital offense in peacetime, marking a significant shift in English law.[36] In 1965, England abolished the death penalty entirely.[37]

B. Historical Context of Execution Methods in the United States

The death penalty in the United States dates back to European colonization, with the first recorded execution occurring in 1608.[38] Capital punishment then became ingrained in early American legal codes,[39] and by the time the Eighth Amendment was adopted in 1791, states uniformly

23. *Id.*
24. *Id.*
25. *Id.*
26. PALMER, *supra* note 8.
27. *Id.* at 9.
28. *Id.*
29. *Id.*
30. *Id.*
31. *Id.*
32. *Id.*
33. KNOWLES, *supra* note 9.
34. *Id.* at 12–13
35. *Id.* at 13.
36. *Id.*
37. STREIB, *supra* note 11, at 3.
38. *Id.* at 4.
39. *Id.*

imposed mandatory death sentences for specific serious offenses.[40] Although the American Colonies listed fewer capital crimes than England, they still mandated death for offenses such as murder, treason, piracy, arson, rape, robbery, burglary, and sodomy.[41]

In colonial America, executions were public events intended to serve spiritual and educational purposes.[42] Public executions were brutal spectacles, often involving decapitations, public hangings, and the display of bodies as warnings.[43] While extreme measures, like burning at the stake, were occasionally used, most executions focused on retribution, rather than excessive physical pain.[44] Over time, however, public executions were abandoned.[45] They were increasingly viewed as uncivilized and moved to private settings, reflecting a transition from local to bureaucratic control.[46]

As executions became increasingly centralized, efforts also shifted toward finding methods that were less painful and visually gruesome.[47] Hanging thus emerged as one of the earliest and most widely used methods.[48] In 1630, John Billington became the first English colonist to be executed by hanging, marking the beginning of this method's long history in America.[49] Hanging methods included the "short drop," causing painful suffocation, and the "long drop," designed to break the neck and sever the

40. Woodson v. North Carolina, 428 U.S. 280, 289 (1976).
41. *Id.* at 289–92. Initially, all murders carried a mandatory death sentence unless they were involuntary, justified, or excused. *Id.* at 289. Public dissatisfaction with this harshness led states to limit capital offenses, beginning with Pennsylvania in 1794, which confined the death penalty to first-degree murder—willful and premeditated killings. *Id.* at 290. Other states, like Virginia and Ohio, soon followed. *Id.* Despite these reforms, juries often found the death penalty too severe and refused to convict, exposing the limitations of distinguishing murderers by rigid legal definitions. *Id.* In response, states began granting juries sentencing discretion, starting with Tennessee in 1838. *Id.* at 291. By the early 20th century, most states had adopted discretionary sentencing or abolished mandatory death penalties altogether. *Id.* at 291–92. By 1963, all jurisdictions had replaced automatic death sentences with systems allowing jury discretion or had eliminated the death penalty entirely. *Id.* at 292.
42. STEIKER, *supra* note 10, at 12.
43. Blume, *supra* note 10, at 1802.
44. *Id.* at 1804.
45. *Id.* at 1826. The last public execution in the United States drew a spectacle of twenty thousand spectators to Owensboro, Kentucky. *Id.* Rainey Bethea, a twenty-two-year-old Black man, was hanged for the rape of a seventy-year-old white widow. *Id.* Although Bethea had also killed the victim, the prosecutor chose to charge him only with rape to allow for a public execution under Kentucky law. *Id.* At the time, a statute required those convicted of murder to be electrocuted at the state penitentiary, while individuals convicted of rape could be hanged in the county of conviction. *Id.* News reports described the event as a "Roman Holiday carnival" atmosphere, with spectators—many reportedly intoxicated—feasting on hot dogs and lemonade. *Id.* The executioner, reportedly drunk and dressed in a white suit and Panama hat, hesitated to pull the lever until a spectator shouted; "Do it now." *Id.* According to some accounts, chaos followed the hanging, as hundreds of onlookers rushed the gallows to collect souvenirs, tearing pieces of the black hood from Bethea's head. *Id.*
46. STEIKER, *supra* note 10.
47. *Id.*
48. *Id.*
49. Blume, *supra* note 10, at 1804.

spinal cord for a quicker death.[50] However, even this method required meticulous calculations.[51] Despite these intentions, hangings could turn into scenes of unexpected brutality.[52] In Missouri, three men endured a disastrously botched hanging that turned into a horrifying spectacle, writhing in agony and groaning for minutes, with one even being dragged back to the gallows, spitting blood, for a second attempt to complete the execution.[53] A local newspaper grimly summarized the event: "The execution today was a horrible piece of butchery owing to the blunders of the sheriff."[54] Decades later, Arizona's first female execution offered a different kind of horror as Eva Dugan's hanging was not drawn out, but no less shocking, with the noose snapping her head clean off and sending it tumbling to the floor as witnesses gasped in disbelief.[55] These instances of inexpertly administered hangings, which often resulted in prolonged suffering or decapitation,[56] highlighted a growing concern for reform[57] that prompted the governor of New York to address the issue in his annual message to the legislature on January 6, 1885.[58] He stated:

> The present mode of executing criminals by hanging has come down to us from the dark ages, and it may well be questioned whether the science of the present day cannot provide a means for taking the life of such as are condemned to die in a less barbarous manner. I commend this suggestion to the consideration of the legislature.[59]

Following this reasoning, states began adopting alternative methods, such as the electric chair.[60] The electric chair, introduced in the late nineteenth century, was hailed as a step forward—a cleaner, more "modern"

50. *See* Zaria Gorvett, *The People Rethinking Methods of Execution*, BBC (June 6, 2018), https://www.bbc.com/future/article/20180604-is-there-a-humane-way-to-kill-a-criminal; *see also* Blume, *supra* note 10, at 1805. Hanging, once a simple execution method requiring only a rope and a tree, evolved over time. *Id.* Early hangings, where the condemned were dropped from a ladder or wagon, often resulted in prolonged, graphic deaths by suffocation, with visible physical reactions. *Id.* To reduce public spectacle, and make the process quicker and less painful, hangings shifted to gallows designed to break the neck with a calculated drop, aiming for a swift death. *Id.*

51. *See* Gorvett, *supra* note 50.

52. *See* STEIKER, *supra* note 10, at 14; Blume, *supra* note 10, at 1808.

53. STEIKER, *supra* note 10, at 14.

54. *Id.*

55. *Id.*

56. *See* STEIKER, *supra* note 10, at 14; *see also* Blume, *supra* note 10, at 1808. As Professor Blume noted, James Black's execution in Marion County on March 18, 1881, was a grim spectacle. *Id.* During the initial fall, the rope broke, leaving Black in a "strangling condition" as he was brought back to the gallows while a new rope was prepared. *Id.* Witnesses reported that he "appeared to suffer terribly" and was "spitting blood." *Id.* On the second attempt, the rope held, but his neck did not break. *Id.* Black struggled for nine minutes, with his pulse still evident, and was pronounced dead twelve minutes later. *Id.* Similarly, John Wright's execution in Darlington on December 10, 1897, took an equally harrowing turn. *Id.* Initially pronounced dead and placed in jail, Wright was discovered alive an hour later and returned to the gallows, where he was hung again until he finally died. *Id.*

57. STEIKER, *supra* note 10, at 14.

58. In re Kemmler, 136 U.S. 436, 444 (1890).

59. *Id.*

60. STEIKER, *supra* note 10, at 14.

way to carry out executions, emblematic of American technological progress.[61] Yet, its debut was anything but smooth.[62] William Kemmler, convicted of murder,[63] became the first individual to be executed by this method.[64] His case tested the constitutionality of the electric chair, with Kemmler arguing before the Supreme Court that it violated the Fourteenth Amendment's due process protection against cruel punishment.[65] However, the Court did not apply an Eighth Amendment analysis in this case, as it was not considered applicable to the states at the time.[66] Instead, the arguments focused on whether the Fourteenth Amendment's due process clause implicitly prohibited cruel and unusual punishment.[67] Nevertheless, the Court upheld the use of electrocution, determining that it provided an instantaneous and painless death.[68] The Court's decision was profoundly mistaken.[69]

In 1985, nearly a century after the Supreme Court upheld the constitutionality of electrocution as humane, the method was scrutinized in *Glass v. Louisiana*,[70] where Justice Brennan critiqued the assumption that death by electrocution was instantaneous and painless, deeming it highly questionable and subject to significant expert disagreement.[71] He highlighted arguments from electrical scientists and medical professionals who asserted that electrocution inflicted unimaginable pain and suffering.[72] These experts explained that the restricted flow of current destroyed tissue

61. *Id.*

62. Philip R. Nugent, *Pulling the Plug on the Electric Chair: The Unconstitutionality of Electrocution*, 2 WM. & MARY BILL RTS. J. 185, 196 (1993). Kemmler was the first person to be executed by electrocution. *Id.* Kemmler's electrocution was described as a "ghastly spectacle," with some witnesses deeming it "far worse" than hanging and predicting that "the electrical experiment" would never again be used for capital punishment. *Id.* Notably, three witnesses who might have been expected to defend the process—the chair's operating engineer, the prosecuting sheriff, and a spokesman for the District Attorney's office—spoke of its cruelty. *Id.* The spokesman acknowledged that "unnecessary and revolting cruelty was inflicted upon the unfortunate Kemmler," describing the execution as causing "horrible suffering," and concluding that "The first great experiment in this matter could hardly be termed a success." *Id. See also* STEIKER, *supra* note 10, at 14. The first electrocution was marred by gruesome failure. *Id.* Over time, adjustments to the method spurred widespread adoption, and by the mid-twentieth century, many states had transitioned from hanging to electrocution. *Id.* Between 1890 and 1950, over 4,000 individuals were executed in the electric chair across twenty-six states. *Id.* However, the promise of a refined method often gave way to horrifying realities. *Id.* Malfunctioning equipment turned some executions into agonizing spectacles. *Id.* In 1928, Philip Jackson, a Black man convicted in Washington, D.C., endured six separate shocks over seventeen excruciating minutes before succumbing. *Id.* Decades later, Florida's infamous "Old Sparky" would ignite new horrors, with flames erupting from the heads of inmates during botched electrocutions in 1990 and 1997. *Id.* Faced with such failures, some states turned to lethal gas, a method born from chemical experimentation during World War I, as they sought alternatives to these brutal missteps. *Id.*

63. *Kemmler*, 136 U.S. at 441.

64. Kelly Wynne, *Today in History: William Kemmler Became the First Person Executed by Electric Chair 129 Years Ago*, NEWSWEEK (Aug. 6, 2019, 11:42 AM), https://www.newsweek.com/today-history-william-kemmler-became-first-person-executed-electric-chair-129-years-ago-1452807.

65. *Kemmler*, 136 U.S. at 438–39.

66. *Id.* at 446.

67. *Id.*

68. *Id.* at 443–44.

69. Nugent, *supra* note 62; *see also*, STEIKER, *supra* note 10, at 14.

70. 471 U.S. 1080, 1088 (1985). *See Kemmler*, 136 U.S. at 436.

71. *Glass*, 471 U.S. at 1088 (Brennan, J., dissenting, joined by Marshall, J.).

72. *Id.*

along its path while often preserving vital organs, resulting in unbearable pain that seemed eternal to those subjected to it.[73] Justice Brennan vividly details the violent and degrading nature of electrocution, emphasizing that it causes extreme suffering far beyond the "mere extinguishment of life."[74]

Witness accounts described prisoners convulsing violently; their bodies contorted as electrical currents coursed through them.[75] The power of the current is so severe that it can cause eyes to pop out, limbs to swell, and skin to stretch and break.[76] Prisoners often defecate, urinate, vomit blood, and sometimes catch fire, accompanied by the nauseating smell of burning flesh.[77] The body heats to extreme levels—autopsies reveal organs too hot to touch, with the brain temperature nearing boiling.[78] Electrocution leaves bodies burned, disfigured, and marked by indignities, underscoring its cruel and inhumane nature.[79] Kemmler's execution offered an early and chilling example of this brutality.[80] Lasting eight agonizing minutes, he was subjected to 2,000 volts, filling the chamber with smoke and a nauseating odor.[81] Decades later, Philip Jackson's experience mirrored this suffering, as multiple shocks over seventeen minutes failed to deliver a swift death.[82]

In addition to the electric chair, states also adopted the gas chamber, which promised a more humane approach, but often caused prolonged suffering.[83] The gas chamber, a method once touted as humane, reveals a grim tale of inhumanity.[84] Prisoners were seated in a sealed chamber filled with cyanide gas, which stops cells from using oxygen, effectively suffocating

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73. *Id.*
74. *Id.* at 1086.
75. *Id.* at 1086–88. In his dissent, Justice Brennan argued that electrocution is not simply a method of extinguishing life, but one marked by extreme violence and indignity. *Id.* Witnesses have described prisoners convulsing, straining against the straps, and displaying grotesque physical reactions—limbs twisting, neck cords protruding, and faces contorted. *Id.* at 1087. The current can cause eyes to pop out, bodies to swell and burn, and involuntary functions like defecation, urination, and vomiting of blood. *Id.* The chamber often fills with the stench of burning flesh and the crackling sound of frying meat. *Id.* at 1087–88. Autopsies reveal severe internal trauma: brains near boiling, livers untouchable from heat, and skin split or charred. *Id.* at 1088. Brennan challenged the claim that electrocution is instantaneous or painless, citing conflicting expert opinions. *Id.* Medical and electrical experts, including French scientist L.G.V. Rota, warned that the current may leave vital organs intact while destroying tissue along its path—inflicting prolonged, conscious suffering. *Id.* For Brennan, this evidence underscored that electrocution amounts to torture, not justice. *Id.* at 1093.
76. *Id.* at 1087.
77. *Id.*
78. *Id.* at 1088.
79. *Id.* at 1086–88.
80. AUSTIN SARAT, GRUESOME SPECTACLES: BOTCHED EXECUTIONS AND AMERICA'S DEATH PENALTY 69 (2014).
81. *Id.*
82. *Id.* at 75–76.
83. STEIKER, *supra* note 10, at 15. By the time the last execution by lethal gas took place in Arizona in 1999, twelve states had adopted the gas chamber, and eleven of them had carried out at least one execution for a total of 594 such executions. *Id.* However, the gas chamber's promise of a "swift and painless" death proved elusive, with prolonged and convulsive executions reported on multiple occasions. *Id.*
84. Randy Dotinga, *Execution by Gas has a Brutal 100-year History. Now it's Back*, WASH. POST (Jan. 24, 2024), https://www.washingtonpost.com/history/2024/01/24/gas-chamber-execution/.

the body from within.[85] Advocates claimed it offered a painless death, but the process was rife with opportunities for error, often leading to prolonged and agonizing deaths.[86] Donald Eugene Harding's execution provides a stark example of this suffering.[87] As cyanide gas filled the chamber, Harding convulsed violently, his face reddening as he gasped and struggled for over ten long minutes.[88] Witnesses were horrified, and one shaken reporter remarked: "[A]nimals are put to sleep more humanely."[89] Furthermore, prisons adopted peculiar measures to manage the deadly gas and mitigate risks to staff.[90] From coating doorways with Vaseline to prevent leaks to patting down the inmate's hair and clothes after execution to avoid poisoning handlers, the procedure underscored its dangers.[91] In some cases, inmates were shaved and stripped to their underwear to reduce the chance of gas lingering on their bodies.[92] Perhaps unsurprisingly, outside the United States, lethal gas has not been adopted as a constitutional execution method; it was only during the Holocaust that Nazi Germany used gas chambers to kill Jewish people.[93] Far from the humane promise, the gas chamber was a chilling experiment in controlled suffering.[94] These historical methods—hanging, electrocution, and lethal gas—were each introduced with the promise of greater humaneness, yet repeatedly failed to deliver on that promise. As these methods drew increasing legal, ethical, and public scrutiny, states turned once again to science in search of a more acceptable alternative. This turn marked the rise of lethal injection.

II. RISE OF LETHAL INJECTION AND ASSOCIATED CONTROVERSIES

This Part examines the rise of lethal injection and the legal, medical, and logistical controversies that have accompanied its use. It begins by outlining the origins of lethal injection as a supposedly humane, science-based alternative to older methods like hanging and electrocution. The discussion then turns to the constitutional framework governing execution

85. *See* Deborah W. Denno, *Gas Chamber Execution Device*, BRITANNICA, https://www.britannica.com/topic/gas-chamber (Jan. 6, 2025). As Deborah Denno describes, the inmate in the gas chamber was strapped to a chair with a perforated seat, positioned above a mixture of chemicals that generated cyanide gas. *Id.* While the gas affected the body extensively, determining the exact moment of unconsciousness or death was difficult, given the challenges in measuring pain and awareness. *Id.*

86. Dotinga, *supra* note 84.

87. SARAT, *supra* note 80, at 111–15. Donald Eugene Harding was the first man executed in Arizona in the harrowing gas chamber in over three decades. *Id.* at 115. Witnesses observed him seated in a black steel chair, restrained by nylon straps, as guards sealed the airtight chamber with the "locking wheel." *Id.* at 112. Once secured, cyanide crystals were released into a pail of sulfuric acid, producing a lethal gas that filled the room. *Id.*

88. *Id.*

89. *Id.*

90. Dotinga, *supra* note 84.

91. *Id.*

92. *Id.*

93. Paul Kirby, *Dutch Jews Died in 'Secret Nazi Gas Chamber' in 1941*, BBC (Feb. 17, 2021), https://www.bbc.com/news/world-europe-56096686.

94. Dotinga, *supra* note 84; *see also* Denno, *supra* note 85. Professor Deborah W. Denno, a death penalty historian, noted: "Every gas execution involved torture of some sort. It's the worst method of execution we've ever had and the most cruel." *Id.*

methods, focusing on *Baze v. Rees*[95] and *Glossip v. Gross*,[96] where the Supreme Court established the standards for Eighth Amendment challenges. From there, it explores the pharmaceutical industry's growing resistance to providing execution drugs, the resulting shortages, and the rise of compounding pharmacies. In response to these pressures, many states have adopted shielding statutes to protect the identities of suppliers and execution teams. Finally, this Part considers how these legal and regulatory shifts have impacted the practical administration of executions, often resulting in failed procedures and prolonged suffering for the condemned. Before lethal injection, states relied on older methods like electrocution, which remained the dominant method of execution for nearly a century, alongside other methods such as hanging, firing squad, and lethal gas.[97] However, growing public concerns about its humanity led state legislatures to reexamine electrocution.[98] By the late 20th century, lethal injection became the main method, prioritizing reduced pain and visible harm.[99]

A. The Medicalization of Execution: Development and Dissent

In 1977, Oklahoma became the first state to propose lethal injection as a method of execution.[100] Five years later, in 1982, Texas carried out the nation's first execution by lethal injection.[101] Dr. Stanley Deutsch, an anesthesiologist at the University of Oklahoma, conceptualized lethal injection as a method resembling a medical procedure: the intravenous induction of general anesthesia.[102] He suggested a three-drug cocktail, describing it as a quick, cost-effective, and "extremely humane" way to carry

95. 553 U.S. 35, 52 (2008).
96. 576 U.S. 863, 878 (2015).
97. *Baze*, 553 U.S. at 42.
98. *Id*; *see also* SARAT, *supra* note 80, at 177, Appendix A. From 1900 to 2010, 3.15% of U.S. executions were botched. *Id.* Of the 8,776 executions Sarat analyzed during this period, 276 were flawed. *Id.* Lethal injection had the highest botched execution rate at 7.12% (75 out of 1,054 executions), followed by lethal gas at 5.4% (32 out of 593). *Id.* Hanging and electrocution had botched rates of 3.12% (85 out of 2,721) and 1.92% (84 out of 4,374), respectively. *Id.* The firing squad, by contrast, reported no botched executions out of 34 instances. *Id.*

Method	**Total Executions**	**Botched Executions**	**Botched Execution Rate**
All Methods	8,776	276	3.15%
Hanging	2,721	85	3.12%
Electrocution	4,374	84	1.92%
Lethal Gas[]	593	32	5.4%
Lethal Injection	1,054	75	7.12%
Firing Squad	34	0	0%

99. STEIKER, *supra* note 10, at 15.
100. *Baze*, 553 U.S. at 42.
101. Jonathan Groner, *Lethal Injection: A Stain on the Face of Medicine*, 325 BMJ 1026, 1026 (2002).
102. *Id.*

out executions.[103] The three-drug cocktail[104] typically begins with a sedative, such as sodium thiopental, barbiturate, or, more recently, midazolam, to render the prisoner unconscious.[105] This is followed by a paralytic agent, like vecuronium bromide or pancuronium bromide, to paralyze the muscles and stop breathing.[106] Finally, potassium chloride is administered to stop the heart.[107] This multi-drug protocol, while widely used, has faced logistical challenges, leading some states and the federal government to adopt a single-drug method for executions using pentobarbital.[108] Federal executions rely exclusively on pentobarbital, a sedative commonly used to euthanize animals, replacing the multi-drug protocols previously used.[109] States like Texas, Missouri, and Georgia began using pentobarbital in 2011 due to a shortage of sodium thiopental—which had been part of the previous lethal injection cocktail along with pancuronium bromide and potassium chloride—and experts noted that concerns over the effectiveness of multi-drug protocols also contributed to the shift, with the federal guidelines specifying pentobarbital as the sole drug for execution.[110]

It is worth highlighting that observers of the first execution by lethal injection noted its clinical appearance, with one describing the setting as resembling a hospital room, complete with medical equipment such as intravenous tubes and a cot on wheels.[111] Although the procedure was considered a success, the American Medical Association's (AMA) Council on Ethical and Judicial Affairs strongly opposed physician involvement in executions.[112] It outlined specific actions that constitute direct participation, including administering or ordering lethal drugs, maintaining injection devices, selecting intravenous sites, and pronouncing death.[113]

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103. *Id.*

104. *See Baze*, 553 U.S. at 45. Justice Roberts, joined by Justices Alito and Kennedy, described Kentucky's lethal injection protocol, which involved administering "2 grams of sodium thiopental, 50 milligrams of pancuronium bromide, and 240 milliequivalents of potassium chloride." *Id.* The protocol required flushing IV lines with 25 milligrams of saline between injections to prevent clogs. *Id.* Certified phlebotomists or EMTs with at least one year of experience were responsible for inserting the IV catheters, with up to one hour allowed to establish primary and secondary IV sites. *Id.* Other personnel handled the preparation and loading of the drug solutions. *Id*; *see also id*. at 45–46. (The warden and deputy warden are tasked with monitoring the administration of the initial dose of thiopental, as well as checking for any issues with the IV catheters and tubing. A physician is present to assist with reviving the prisoner if a last-minute stay of execution is granted. However, by statute, the physician is barred from participating in the execution process itself and may only certify the cause of death.).

105. *See generally*, Susie Neilson, *Lethal Injection Drugs' Efficacy and Availability for Federal Executions*, NPR (July 26, 2019, 7:11 PM), https://www.npr.org/2019/07/26/745722219/lethal-injection-drugs-efficacy-and-availability-for-federal-executions.

106. *Id.*

107. *Id.*

108. Josiah Bates, *Why the Justice Department's Plan to Use a Single Drug for Lethal Injections is Controversial*, TIME MAGAZINE? (July 29, 2019, 7:01 PM), https://time.com/5636513/pentobarbital-executions-justice-department/.

109. *Id.*

110. *See* Megan Doyle, *Guerilla Warefare: The Importance of Pharmaceutical Company Support, or Lack Thereof, in the Constitutionality of the Death Penalty in the United States*, 27 UNIV. FLA. J. L. & PUB. POL'Y 191, 202 (2016); *see also* Bates, *supra* note 108.

111. Groner, *supra* note 101.

112. *Id.* at 1027.

113. *Id.*

This position aligns with the long-standing principle expressed in the Hippocratic Oath: "I will not give a lethal drug to anyone if I am asked, nor will I advise such a plan."[114]

This position was also explicitly articulated in the AMA amicus brief filed in *Bucklew v. Precythe*[115] on writ of certiorari to the Supreme Court, where the AMA reiterated its opposition to physician involvement in executions.[116] The brief critiqued the "medicalization" of executions, arguing that efforts to mimic medical procedures misled both physicians and the public.[117] This portrayal fostered the illusion of humane and scientific oversight, allowing society to avoid confronting the moral weight of capital punishment.[118] The AMA contended that this approach diminished the value of life, making its extinction appear easier.[119] The brief further emphasized that the medical profession, which was fundamentally committed to humanity and reverence for life, should play no role in this process.[120]

B. Challenging Execution Methods: The Eighth Amendment in Baze v. Rees *and* Glossip v. Gross, *Pharmaceutical Companies, and State Secrecy*

Lethal injection, once promoted as a more humane alternative to earlier methods, has generated persistent legal and practical controversy. While the Supreme Court has upheld its constitutionality, challenges related to drug access, secrecy statutes, and execution failures continue to raise serious concerns about its implementation. The issue in *Baze v. Rees* was whether the risk of improper application of the lethal injection protocol, because of the risk that the protocol's terms might not be properly followed, resulting in significant pain, renders the existing method unconstitutional.[121] The Court answered in the negative, holding that challenges to methods of execution, as cruel and unusual under the Eighth Amendment, have consistently been rejected.[122] Chief Justice Roberts authored the opinion of the Court in which he emphasized that society has progressively advanced toward more humane execution methods, transitioning from the firing squad, hanging, the electric chair, and the gas chamber, to the modern consensus on lethal injection.[123] Roberts noted that the Eighth

114. *Hippocratic Oath*, PERSEUS, https://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0252 (last visited Feb. 2, 2025).
115. 587 U.S. 119 (2019).
116. Brief for Am. Med. Ass'n as Amicus Curiae in Support of Neither Party at 13, *Bucklew*, 587 U.S. at 119 (No. 17-8151).
117. *Id.* at 14.
118. *Id.* at 12.
119. *Id.*
120. *Id.* at 13.
121. Baze v. Rees, 553 U.S. 35, 41 (2008).
122. *Id.* at 62.
123. *Id.*

Amendment's broad framework supported this evolution, enabling legislatures to adapt execution methods in response to advancements that ensure humane capital punishment.[124]

In his concurrence, Justice Alito provided the standard for assessing claims of cruel and unusual punishment of an execution method under the Eighth Amendment.[125] First, Alito emphasized the presumption that lethal injection is constitutionality as a method of execution.[126] According to Alito, to satisfy the burden of proving that lethal injection protocol (or a different execution method) must be modified under the Eighth Amendment, a prisoner must show that the proposed change would "significantly reduce a substantial risk of severe pain."[127] Evidence of only a minor reduction in risk is not enough.[128] In addition, the challenge must be backed by a well-established scientific consensus, not merely the testimony of a few experts or limited studies.[129] A state's refusal to act in the face of such evidence would be required to demonstrate a constitutional violation.[130] The plurality in *Baze* also made clear that a condemned must also identify a feasible alternative method with less risk of pain.[131]

Justice Alito, who concurred in *Baze* and outlined how courts should evaluate challenges to execution methods under the Eighth Amendment,[132] also authored the majority opinion in *Glossip*.[133] Alito noted that "some risk of pain is inherent in any method of execution," and therefore, the Constitution "does not require the avoidance of all risk of pain."[134] He also observed that while most people hope for a painless death, "many do not have that good fortune."[135] Alito found that interpreting the Eighth Amendment to require the elimination of "essentially all risk of pain" would, in effect, render the death penalty unconstitutional, a result he determined the Constitution does not mandate.[136] Alito underscored the difficulty of challenging an execution method, noting that although methods of execution have evolved, the Supreme Court has never invalidated a state's chosen method of execution as cruel and unusual punishment (including hanging, firing squad, the three-drug lethal injection, and electrocution—even when unsuccessful).[137] Alito's observation reflects

124. *Id.*
125. *Id.* at 63–67 (Alito, J., concurring).
126. *Id.* at 63.
127. *Id.* at 67 (emphasizing the high burden placed on inmates challenging lethal injection protocols).
128. *Id.*
129. *Id.*
130. *Id.*
131. *Id.* at 61.
132. *Id.* at 62–67 (Alito, J., concurring).
133. Glossip v. Gross, 576 U.S. 863, 867 (2015).
134. *Id.* at 869.
135. *Id.*
136. *Id.*
137. *Id.*

the principle articulated in *Baze*, where the Court emphasized that states are entitled to deference in selecting their methods of execution.[138]

This history highlights the significant deference granted to states in selecting their methods of carrying out the death penalty.[139]

1. State Secrecy and the Pharmaceutical Industry's Role in Lethal Injection Controversies

Although the Supreme Court upheld the constitutionality of lethal injection in Baze and Glossip, efforts by advocacy groups have made it increasingly difficult for states to obtain the drugs needed to carry out those protocols.[140] Advocates and human rights groups against the death penalty have used two key approaches to push pharmaceutical companies to stop producing execution drugs: legal action and public campaigns.[141] Lawsuits have targeted companies linked to botched executions, while public campaigns leverage media and online platforms to expose these companies and highlight ethical concerns.[142]

In particular, pressure from anti-death penalty advocates led the manufacturer of sodium thiopental to cease supplying the drug for use in executions, marking a significant victory for these efforts.[143] As a result, states that had relied on a three-drug protocol faced a shortage after European human rights groups pressured British manufacturers to halt distribution and legal action prompted the British government to ban its export.[144] As a replacement, states turned to pentobarbital, using it in both three-drug protocols and as a standalone method.[145] However, production ceased in 2011 when the primary European supplier stopped manufacturing the drug,[146] leaving states to rely on compounding pharmacies despite ongoing supply challenges.[147] Compounding pharmacies, while regulated by the FDA, are primarily overseen by state authorities for their daily operations,[148] adding another layer of complexity to the already contentious issue of drug availability for executions.

States have accordingly resorted to questionable means to procure drugs for executions.[149] In Texas, the Woodlands Compounding Pharmacy

138. Baze v. Rees, 553 U.S. 35, 41, 62 (2008).
139. *See* Glossip v. Gross, 576 U.S. 863, 869 (2015). Justice Alito noted that capital punishment is constitutional, and thus there must be a constitutional means of carrying it out, with the Constitution not requiring the elimination of all risk of pain inherent in execution methods.
140. Doyle, *supra* note 110, at 201.
141. *Id.*
142. *Id.*
143. *See* Bucklew v. Precythe, 587 U.S. 119, 125 (2019); *see also* Glossip v. Gross, 576 U.S. 863, 870 (2015).
144. *See id.*; *see also* Doyle, *supra* note 110, at 201–02.
145. Doyle, *supra* note 110, at 201.
146. *Id.*
147. *See* Bates, *supra* note 108.
148. *Compounding and the FDA: Questions and Answers*, U.S. FOOD AND DRUG ADMIN., https://www.fda.gov/drugs/human-drug-compounding/compounding-and-fda-questions-and-answers (last visited Feb. 3, 2025).
149. *See* Bates, *supra* note 108.

demanded the return of pentobarbital it had sold for executions after its identity was publicly exposed.[150] Similarly, Missouri purchased pentobarbital with cash from a compounding pharmacy to avoid creating a paper trail.[151] These difficulties in securing execution drugs, combined with public backlash and the risk of supplier exposure, have led states to adopt increasingly secretive practices, shielding the identities of suppliers and execution teams to preserve access to the necessary drugs.

2. Shielding Statutes and Hidden Transactions in Execution

Nationwide, states have attempted to conceal execution-related transactions and participants. Since January 2011, thirteen states have enacted new secrecy statutes that conceal key details about the execution process, according to the Death Penalty Information Center.[152] South Carolina serves as a clear example of this trend, enforcing stringent confidentiality measures that shield the identities of execution team members and conceal details about the procurement of drugs used to carry out death sentences.[153] In particular, South Carolina's *Shield Statute* established that the identity of any individual or organization involved in the planning or execution of a death sentence must remain confidential.[154] The personal information of all members of the execution team is protected from discovery, subpoenas, or any other legal processes that could compel its disclosure in any administrative, civil, or criminal proceeding.[155] This protection extends to courts, administrative agencies, boards, commissions, legislative bodies, or any similar entity exercising authority within the State.[156] Building on this confidentiality, the *Shield Statue* further prohibits the knowing disclosure of identifying information, adding penalties for violations.[157] Under this provision, anyone whose identity—or the identity of their immediate family or affiliated entity—is disclosed in violation of the statute may bring a civil lawsuit against the person responsible.[158] As a remedy, they may seek compensation for actual damages and punitive damages if the violation is

150. *Id.*
151. *Id.*
152. *Press Release—Behind the Curtain: Secrecy and the Death Penalty in the United States*, THE DEATH PENALTY INFO. CENTER, https://deathpenaltyinfo.org/stories/press-release-behind-the-curtain (last visited May 19, 2025) (Georgia, for instance, classifies execution-related information as a "state secret."). Renuka Rayasam, *States Try to Obscure Execution Details as Drugmakers Hinder Lethal Injection*, KFF HEALTH NEWS (Mar. 30, 2023), https://kffhealthnews.org/news/article/lethal-injection-death-penalty-drugmakers-opposition/.
153. *See generally* S.C. CODE ANN. § 24-3-580(B)–(I) (2023).
154. S.C. CODE ANN. § 24-3-580(B).
155. *Id.*
156. *Id.*
157. S.C. CODE ANN. § 24-3-580(C) ("A person shall not knowingly disclose the identifying information of a current or former member of an execution team or disclose a record that would identify a person as being a current or former member of an execution team. Any person and his immediate family, or entity whose identity is disclosed in violation of this section shall have a civil cause of action against the person who is in violation of this section and may recover actual damages and, upon a showing of a willful violation of this section, punitive damages. A person who violates the provisions of this subsection also must be imprisoned not more than three years.").
158. *Id.*

proven to be intentional.[159] Additionally, a person who breaches this rule may face imprisonment for up to three years.[160]

The statute then addresses exemptions related to procurement processes, ensuring that the acquisition of materials for executions is streamlined and shielded from standard regulations.[161] Expanding on procurement, the law specifically exempts out-of-state acquisitions of execution drugs from South Carolina's licensing and regulatory requirements.[162] Additionally, such acquisitions are not subject to any regulations established by the Board of Pharmacy.[163]

Additionally, pharmacies and pharmacists supplying execution drugs are granted significant exemptions from state laws, streamlining their participation in the process.[164] This exemption applies specifically to drugs intended for use in executions, eliminating the need for a physician's prescription.[165] However, it does not extend to licensing or permitting requirements for other prescription drugs or pharmaceutical devices.[166]

To maintain confidentiality in financial matters, the *Shield Statute* requires de-identification of financial records related to execution transactions.[167] Finally, the law underscores the legislative intent to ensure absolute confidentiality, emphasizing a broad construction of the statute: courts in South Carolina are directed to interpret this section expansively

159. S.C. CODE ANN. § 24-3-580(C).
160. *Id.*
161. S.C. CODE ANN. § 24-3-580(D) ("Any purchase or acquisition of drugs, medical supplies, and medical equipment necessary to execute a death sentence shall be exempt from the entirety of the South Carolina Procurement Code and all of its attendant regulations.").
162. S.C. CODE ANN. § 24-3-580(E) (The out-of-state acquisition of any drug intended for use by the department in the administration of the death penalty shall be exempt from all licensing processes and requirements administered by the Department of Health and Environmental Control or by any other department or agency of the State of South Carolina. Furthermore, the out-of-state acquisition of any drug intended for use by the department in the administration of the death penalty shall be exempt from all regulations promulgated by the Board of Pharmacy.").
163. *Id.*
164. S.C. CODE ANN. § 24-3-580(F) ("Any pharmacy or pharmacist, whether located within or without the State, that is involved in the supplying, manufacturing, or compounding of any drug intended for use by the department in the administration of the death penalty shall be exempt from all licensing, dispensing, and possession laws, processes, regulations, and requirements of or administered by the Department of Labor, Licensing and Regulation, the Board of Pharmacy, or any other state agency or entity, found anywhere in the South Carolina Code of Laws or South Carolina Code of Regulations, only to the extent that the licensing, dispensing, and possession laws, processes, regulations, and requirements pertain to the drugs intended for use in the administration of the death penalty, and no prescription from any physician shall be required for any pharmacy or pharmacist to supply, manufacture, or compound any drug intended for use in the administration of the death penalty.").
165. *Id.*
166. *Id.* ("This exemption shall not apply to any licensure or permitting requirements for the supply, manufacture, or compounding of any other legend drug or pharmaceutical device.").
167. S.C. CODE ANN. § 24-3-580(H) ("The Office of the Comptroller General and the Office of the State Treasurer shall work with the South Carolina Department of Corrections to develop a means to ensure that the state's accounting and financial records related to any transaction for the purchase, delivery, invoicing, etc. of or for supplies, compounds, drugs, medical supplies, or medical equipment utilized in the execution of a death sentence are kept in a de-identified condition.").

to fully uphold the General Assembly's objective of protecting the identifying information of any individual or entity directly or indirectly involved in the planning or execution of a death sentence.[168]

This *Shield Statute* was challenged in *Bixby v. Stirling*.[169] Plaintiffs—death-sentenced inmates under the supervision of the South Carolina Department of Corrections (SCDC)—filed an action under 42 U.S.C. § 1983, alleging a constitutional right to access specific information about the drugs SCDC acquired for lethal injection executions.[170] Plaintiffs argued that the statute does not explicitly restrict access to critical information, which raised concerns about the integrity of the lethal injection drugs.[171] They highlighted the extraordinary difficulty the SCDC Director faced, making over 1,300 contacts to obtain pentobarbital, which they claimed casts doubt on the quality of the drugs acquired.[172] The Shield Statute's broad confidentiality protections, exemptions from licensing and regulatory requirements, and lack of transparency regarding drug sources and manufacturing further exacerbated these concerns.[173] Plaintiffs also asserted that they could not access information about the professional qualifications of the team preparing and administering the execution, which prevented the inmate from making an informed choice about their method of execution.[174] Furthermore, while the Shield Statute requires compliance with federal regulations for drug importation, the Plaintiffs argued that it simultaneously blocks any mechanism to verify such compliance, leaving the inmate and the public without meaningful oversight.[175] The federal district court found that because the inmates had been provided with all the information and choices allowed under the Death Penalty Statute, they could not show any deprivation of a state-created right.[176] As a result, the court concluded that the inmates were not entitled to injunctive relief.[177]

The persistent challenge of locating a viable vein highlights a critical flaw in the administration of lethal injections,[178] often leading to prolonged and botched executions.[179] The family of Joe Nathan James, an inmate executed in 2022 in Alabama, sued state officials, alleging that the contentious execution caused significant suffering and lasted for hours.[180] The lawsuit claimed that the execution demonstrated a pattern of inflicting

168. S.C. CODE ANN. § 24-3-580(I).
169. No. 3:24-CV-05072, 2024 U.S. Dist. LEXIS 168298, at *4–5 (D.S.C. Sept. 18, 2024).
170. *Id.* at *3.
171. *Id.* at *9.
172. *Id.* at *10.
173. *Id.*
174. *Id.*
175. *Id.* at *11.
176. *Id.* at *19.
177. *Id.* at *20.
178. SARAT, *supra* note 80, at 130-131.
179. *Bixby*, 2024 U.S. Dist. LEXIS 168298, at *9–10.
180. Drew Taylor, *Family of Death Row Inmate Joe Nathan James Suing Alabama*, CBS 42 (May 3, 2023, 5:41 PM), https://www.cbs42.com/news/death-penalty/family-of-death-row-inmate-joe-nathan-james-suing-alabama-claim-he-was-in-excessive-pain-during-execution/. (

additional terror, pain, and humiliation far beyond isolated errors.[181] An independent autopsy reported that James had endured severe suffering, with multiple puncture wounds observed around his wrists and hands, allegedly caused by technicians struggling to locate a vein for IV insertion.[182] Rickey Ray Rector, who chose lethal injection to avoid being shocked or gassed,[183] spent nearly an hour in Arkansas's execution chamber as medical staff struggled to find a vein, with witnesses overhearing his cries of distress.[184] Similarly, in Texas in 1986, Randy Woolls, a drug addict, had to assist technicians in locating a viable injection site.[185] In 1992, Billy Wayne White, a longtime heroin user, endured 47 minutes on the gurney while executioners searched for a vein, ultimately requiring his assistance as well.[186] A failed IV and extended drug administration defined Clayton Lockett's harrowing execution.[187]

These repeated failures to find veins and carry out lethal injections show how broken the process has become. In response, some states have started looking for new methods. One of these methods—nitrogen hypoxia—has been introduced with the promise of being easier and more humane. The next section looks at how this method developed and the concerns it raises.

III. NITROGEN HYPOXIA: A NEW CONTENDER

This section first outlines the legal framework and state-level developments that led to the adoption of nitrogen hypoxia. It then examines the scientific debate surrounding the method, contrasting official claims with medical critiques. The discussion continues with an overview of how nitrogen hypoxia physiologically causes death, followed by a review of state protocols and whether they truly prevent pain. Finally, this section analyzes the case of Kenneth Eugene Smith, the first person executed using nitrogen hypoxia, and the legal challenges raised in its wake.

A. Nitrogen Hypoxia: Legal Framework and Scientific Controversy

In 2014, publicity about several botched lethal injections highlighted the risks of pain and suffering in executions, prompting states like Oklahoma to explore new methods, such as nitrogen asphyxiation, or to

181. *Id.*
182. *Id.*
183. SARAT, *supra* note 80, at 135.
184. *Id.* at 130.
185. *Id.* at 131.
186. *Id.* at 130.
187. Glossip v. Gross, 576 U.S. 863, 872 (2015). Lockett's self-inflicted injury at the bend of his elbow hindered IV placement, leading the team to spend nearly an hour and more than a dozen failed attempts before accessing a vein in his femoral artery, which was covered with a sheet for dignity. Despite being declared unconscious, the IV was infiltrated, causing the lethal drugs to leak into surrounding tissue instead of entering his bloodstream. Lockett visibly moved and spoke during the execution, which was halted after 33 minutes, but he ultimately died 10 minutes later, highlighting the errors and anguish caused by the lethal injection procedure.

reinstate old ones like the electric chair and firing squad.[188]As the birthplace of lethal injection,[189] Oklahoma once again led the charge in execution innovation by becoming the first state to adopt nitrogen hypoxia.[190] As of 2024, Alabama, Oklahoma, and Mississippi have approved nitrogen hypoxia as a method of execution.[191]

In Oklahoma, Senate Bill 794, passed unanimously in the state Senate with a 45-0 vote, outlines the legal framework and conditions under which nitrogen hypoxia may be used as a method of execution.[192] Section 1014. A makes lethal injection the default method of execution.[193] However, under Section 1014. B, "If the execution of the sentence of death as provided in subsection A of this section is held unconstitutional by an appellate court of competent jurisdiction or is otherwise unavailable, then the sentence of death shall be carried out by nitrogen hypoxia."[194] Likewise, Sections C and D outline additional fallback methods.[195] If the use of lethal injection or nitrogen hypoxia is deemed unconstitutional or unavailable, Section C provides for electrocution, while Section D designates the firing squad as the final alternative.[196]

In support of introducing nitrogen hypoxia in Senate Bill 794, Senator Sykes stated, "Today, we are moving forward with a plan that would allow the state to proceed with the implementation of the death penalty for our most heinous criminals."[197] He emphasized the state's obligation to enforce the death penalty effectively, calling it "a just and appropriate punishment for our worst criminals" and describing nitrogen hypoxia as "one of the most humane methods for carrying out the sentence."[198] Sykes further noted the importance of legislative action to ensure "the will of the people of Oklahoma will not be dismissed by the courts."[199]

At the request of Oklahoma State Representative Mike Christian,[200] who co-authored Senate Bill 794 with Oklahoma Senator Sykes,[201] a study

188. STEIKER, *supra* note 10, at 16.
189. Baze v. Rees, 553 U.S. 35, 42 (2008); Glass v. Louisiana, 471 U.S. 1080, 1086–88. (1985).
190. Jaweed Kaleem, *Oklahoma is Poised to become the First State to Use Nitrogen Gas in Executions*, L.A. TIMES (Mar. 14, 2018, 10:30 PM), https://www.latimes.com/nation/la-na-oklahoma-death-penalty-20180314-story.html.
191. Sean Murphy, *Why are States like Alabama Exploring New Execution Methods*, ASSOCIATED PRESS (Jan. 22, 2024, 2:42 PM), https://apnews.com/article/lethal-injection-nitrogen-death-penalty-5241bcd8e0c0ed414b384eb90633782e.
192. S.B. 794, 2015 Leg., 1st Sess. (Okla. 2015).
193. *Id.*
194. *Id.*
195. *Id.*
196. *Id.*
197. *Senate Committee Advances Bill to Modify Execution Procedure*, OKLA. SENATE (Feb. 10, 2015, 12:26 AM), https://oksenate.gov/press-releases/senate-committee-advances-bill-modify-execution-procedure.
198. Okla. S.B. 794.
199. *Id;* OKLA. SENATE, supra note 197.
200. *Id.*
201. *Id.*

was conducted to examine whether hypoxia induced by nitrogen gas inhalation could serve as a viable alternative to the execution methods currently authorized under Oklahoma law (the Study).[202] Michael Copeland, J.D.; Thom Parr, M.S.; and Christine Papas, J.D., PhD conducted this Study.[203] The Study offers findings that prioritize the convenience of nitrogen hypoxia as a method of execution, emphasizing its practicality while sidelining robust scientific or medical validation.[204]

The Study begins by praising nitrogen hypoxia as both humane and easy to administer, drawing parallels to its widespread use in assisted suicide practices.[205] It portrays nitrogen hypoxia as a humane method of execution, highlighting nitrogen-inert qualities—odorless, colorless, and tasteless—and its presence as 78% of the air we breathe, minimizing the risk of allergic reactions.[206] It claims the process prevents the anxiety associated with asphyxiation and describes a rapid timeline to unconsciousness, occurring within 20 seconds, with no substantial discomfort and potential euphoria.[207] Drawing on accounts of using gas hypoxia in assisted suicides, the Study emphasizes the peaceful and dignified nature of the method, noting its endorsement by right-to-die groups.[208] In addition, it highlights that nitrogen hypoxia would be simple to administer, with nitrogen being readily available and easy to source.[209] The findings also highlight logistical benefits, such as the method's independence from the cooperation of the offender, and assert that nitrogen inhalation assures a quick and painless death.[210] The Study concludes that nitrogen inhalation would be a humane method to administer a death sentence and asserts that it could be carried out without the involvement of licensed medical professionals.[211]

However, these conclusions ease of implementation and resource accessibility,[212] rather than a thorough evaluation of whether nitrogen hypoxia genuinely meets the Eighth Amendment standard for avoiding cruel and unusual punishment. In addition, the professional backgrounds of its authors provide insight into their areas of expertise—or lack

202. Michael Copeland, Thomas Parr, & Christine Papas, *Nitrogen Induced Hypoxia as a Form of Capital Punishment*, DEATH PENALTY INFO. CTR. 2, https://dpic-cdn.org/production/legacy/Copeland%20Report_Nitrogen-Hypoxia.pdf (last visited Feb. 3, 2025).
203. *Id.* at 1.
204. OKLA. SENATE, *supra* note 197; Okla. S.B. 794.
205. Copeland, Parr, & Papas, *supra* note 202, at 6 (highlighting the popularity of "exit bags"—filled with inert gases like nitrogen or helium—promoted by right-to-die advocates as a preferred method for euthanasia, and describing the method as simple and inexpensive, the Study underscores its accessibility and claims that reports suggest the process is painless).
206. *Id.* at 9.
207. *Id.*
208. *Id.*at 10.
209. *Id.* at 2.
210. *Id. But see* Gorvett, *supra* note 50 (noting that one significant issue with nitrogen hypoxia is its reliance on the prisoner's cooperation; if the prisoner holds their breath or breathes too shallowly, the process may take considerably longer to cause death).
211. Copeland, Parr, & Papas, *supra* note 202.
212. OKLA. SENATE, *supra* note 197.

thereof—in fields relevant to the Study's subject matter. Collectively, the Study's authors exhibit expertise in law, criminal justice, and political science; however, none possess medical degrees or expertise, raising concerns about the reliability of their conclusions on nitrogen hypoxia.[213]

The Study, which individuals *without* medical training authored, was challenged in a response article by two medical doctors, Dr. Damian M. Bailey and Dr. David C. Poole (the Critique). The Critique challenged the Study's conclusions by identifying significant inaccuracies, highlighting a fundamental misunderstanding of respiratory physiology, and offering a detailed explanation of how nitrogen hypoxia actually causes death.[214] Together, these doctors present vast medical experience.[215]

Poole and Bailey challenge the Study's claims, particularly the assertion that 1–2 breaths of pure nitrogen can cause immediate

213. *C. Michael Copeland*, JONES GOTCHER ATT'YS AND COUNS., https://jgbok.com/c-michael-copeland/ (last visited Feb. 4, 2025). Michael Copeland lacks medical training or experience. According to his profile on the Jones Gotcher Attorneys and Counselors website, Copeland's professional focus spans "complex and class action litigation, commercial and general civil litigation, securities litigation, construction, products liability, and intellectual property matters." His extensive experience in civil litigation is evident from his professional record, but it also confirms his lack of any medical training or expertise. *Thomas Parr*, E. CENT. U., https://www.ecok.edu/directory/thomas-parr (last visited Feb. 4, 2025). Thomas Parr, another co-author of the Study, brings a career rooted in law enforcement rather than medicine or scientific research. According to his profile at East Central University in Ada, Oklahoma, Parr serves as an assistant professor of human resources in the Criminal Justice Program and acts as the faculty advisor for Lambda Alpha Epsilon criminal justice fraternity and Sigma Tau Gamma fraternity. His prior experience includes teaching at Brookhaven College, the University of North Texas, and Texas Woman's University. Notably, Parr has an extensive background in law enforcement, including serving as a captain of detectives. His academic credentials—a bachelor's degree in electronic technology/aviation from Southeastern Oklahoma State University and a master's degree in human resources/criminal justice from ECU. *Christine Pappas*, E. CENT. U., https://www.ecok.edu/directory/christine-pappas (last visited Feb. 4, 2025). Dr. Christine Pappas, J.D., Ph.D., the third co-author of the study on nitrogen hypoxia as a method of execution, has a distinguished career in political science and legal studies but lacks any medical training or experience. As Chair and professor in the Department of Law, Politics and Society at East Central University, she teaches courses such as Political Science Research Methods, Constitutional Law, Women in Politics, and Tribal Politics. Dr. Pappas earned her B.A., M.A., and Ph.D. at the University of Nebraska-Lincoln and her J.D. at the University of Nebraska College of Law.

214. *Profiles: Damian Bailey*, U. OF S. WALES, https://pure.southwales.ac.uk/en/persons/damian-bailey (last visited Feb. 3, 2025).

215. Dr. Damian Bailey is an expert in physiology and biochemistry, with a particular focus on oxygen transport and its effects on the brain. A Royal Society Wolfson Research Fellow and Professor of Physiology and Biochemistry, Dr. Bailey is also the Head of the Neurovascular Research Laboratory, where he oversees cutting-edge research into the impact of exercise and hypoxia on vascular and brain function. Dr. Bailey's academic journey began as the first Research Physiologist at the British Olympic Medical Centre, where his Ph.D. thesis explored the limitations of systemic oxygen transport and its implications for human performance. His lab employs state-of-the-art techniques, from molecular analysis to advanced imaging methods like diffusion-weighted MRI, to study how oxygen deprivation influences brain structure and function. *Profiles: Damian Bailey*, U. OF S. WALES, https://pure.southwales.ac.uk/en/persons/damian-bailey (last visited Feb. 3, 2025). Dr. David Poole brings extensive medical and physiological expertise to his analysis. A University Distinguished Professor and Director of the Cardiorespiratory Exercise Lab, Dr. Poole holds a Ph.D. in Kinesiology with a specialization in Physiology, as well as a D.Sc. in Physiology. His teaching focuses on advanced courses such as the Physiology of Exercise and Topics in Biological Bases of Kinesiology. Dr. Poole's research interests span cardiorespiratory disease, respiration, microcirculation, and the structure and function of the diaphragm, reflecting his deep understanding of the physiological processes underlying oxygen delivery and utilization. KAN. STATE U., https://www.hhs.k-state.edu/kines/about/people/poole.html (last visited Feb. 3, 2025).

unconsciousness. They argue that the cited literature does not support this assertion, and that the Study fails to reflect the actual physiological response to oxygen deprivation.[216] Adding to this critique, Poole and Bailey point out how claims that execution by nitrogen is "perhaps the most humane method of execution ever devised" stand in stark contrast to firsthand accounts of its effects.[217]

B. Mechanisms of Death: How Nitrogen Hypoxia Works

The Alabama Department of Corrections outlines a step-by-step procedure to implement execution by nitrogen (hereinafter "the Protocol").[218] As evidenced by the redacted portions of the Protocol,[219] significant details remain concealed.[220] According to the Protocol, Alabama's process for execution by nitrogen hypoxia involves strapping the individual to a gurney, fitting a mask over their head, and releasing nitrogen into the mask.[221] The Protocol specifies that the Warden or Assistant Warden must inspect and verify the nitrogen hypoxia system to ensure it is pressurized and correctly set. [222] The breathing air supply is opened and allowed to flow into the mask.[223] Once verified, the condemned inmate is escorted into the execution chamber, placed on a gurney by the Execution Team, and fitted with a pulse oximeter to monitor vital signs.[224] Before placing the mask on the inmate, a member of the Execution Team uses a portable oxygen meter to test the inflow of breathing gas for at least fifteen seconds to confirm that breathing air is being supplied.[225] Once the mask is secured on the inmate's face, a team member monitors the pulse oximeter to confirm proper placement, after which it is continuously monitored for two minutes to ensure the mask is working correctly.[226] The Protocol then specifies that, following this verification, the Warden or Assistant Warden activates the system to release the nitrogen gas.[227] The gas is administered for fifteen or five minutes following a flatline indication on the EKG, whichever is longer.[228]

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216. David C. Poole & Damian M. Bailey, *Death by Nitrogen Anoxia: On the Integrated Physiology of Human Execution*, 109 WILEY ED.: EXP. PHYSIOLOGY 1009, 1012 (2024).
217. *Id.* at 1009.
218. *Execution Procedures: Lethal Injection, Nitrogen Hypoxia, Electrocution*, ALA. DEP'T CORR. 1 (Nov. 20, 2023), https://storage.courtlistener.com/recap/gov.uscourts.almd.81685/gov.uscourts.almd.81685.16.1.pdf.
219. Smith v. Hamm, 144 S. Ct. 414, 414 (2024) (Sotomayor, J., dissenting) (dissenting from the denial of Smith's application for a stay of his execution by nitrogen hypoxia and denial of certiorari, remarked, describing the procedure Alabama implemented for execution by nitrogen: "The details are hazy because Alabama released its heavily redacted protocol.").
220. ALA. DEP'T CORR., *supra* note 218.
221. *Id.* at 15–16.
222. *Id.* at 15.
223. *Id.*
224. *Id.*
225. *Id.*
226. *Id.* at 16.
227. *Id.*
228. *Id.* at 17.

While the Protocol describes how nitrogen is administered, it does not explain what the body undergoes once oxygen is removed. The physiological process that follows reveals the intense and potentially painful nature of death by nitrogen hypoxia. David C. Poole and Damian M. Bailey offer a detailed scientific explanation of how nitrogen hypoxia leads to death, with a focus on the brain's extreme vulnerability to oxygen deprivation.[229] The brain, despite being less than 2% of the body's weight, consumes 20–25% of its oxygen to maintain essential functions, like ionic balance and neurotransmission, due to its minimal energy reserves and high metabolic demands.[230] If the supply is interrupted, the brain depletes its oxygen reserves within a second, resulting in rapid progression to unconsciousness, coma, and neuronal damage.[231] According to Poole and Bailey, breathing pure nitrogen accelerates this process.[232] The first inhalation lowers oxygen levels in the lungs, disrupting the transfer of oxygen to the blood and causing arterial oxygen levels to drop rapidly.[233] The carotid bodies, which detect oxygen levels in the blood, respond to this drop by triggering rapid breathing that further depletes the lungs of any remaining oxygen, exacerbating oxygen deprivation.[234] As oxygen levels in the blood fall below a critical threshold (60 mmHg), intense air hunger and involuntary diaphragm spasms occur, similar to the struggle seen during suffocation or extreme breath-holding.[235] In essence, Nitrogen, a colorless and odorless gas, constitutes about 78 percent of the air humans breathe.[236] However, under nitrogen hypoxia, the individual inhales only nitrogen, depriving the body of oxygen.[237] This condition, known as hypoxia—a state of insufficient oxygen—leads to unconsciousness within minutes, followed by death.[238]

C. Debunking the Myth of Painlessness

While the Protocol outlines the steps for administering nitrogen hypoxia, Poole and Bailey argue that the process may not be as quick or painless as proponents of nitrogen hypoxia claim.[239] Rather than losing consciousness within a few breaths and dying in under a minute, individuals are likely to experience severe discomfort and intolerable air hunger for about a minute, with death taking up to 5-6 minutes.[240] They also note

229. Poole & Bailey, *supra note* 216, at 1011.
230. *Id.*
231. *Id.*
232. *Id.*
233. *Id.*
234. *Id.* at 1011–12.
235. *Id.* at 1013.
236. Jan Hoffman, *Nitrogen Hypoxia: What to Know About This New Method of Execution*, N.Y. TIMES, https://www.nytimes.com/2024/01/25/health/what-is-nitrogen-hypoxia.html (last visited Jan. 25, 2024).
237. *Id.*
238. *Id.*
239. Poole & Bailey, *supra note* 216, at 1011.
240. *Id.* (noting that the timing depends on factors like breathing patterns and the rate of brain oxygen depletion).

that reports of quicker deaths raise the possibility of errors, such as nitrogen contamination with oxygen or leaks in the delivery system.[241] This also highlights the dependency on the inmate's cooperation,[242] as holding their breath or shallow breathing could significantly delay the process.[243] In all likelihood, the prisoner would need to be anesthetized beforehand, bringing us back to square one with the challenges faced by lethal injection: no pharmaceutical company wants its drugs used for executions.[244] Further complicated, the failure to provide for sedation highlights the inhumanity of the process.[245] While even the American Veterinary Medical Association recommends sedating large animals before euthanizing them in this manner; however, Alabama makes no such provision for human beings facing execution by nitrogen asphyxiation.[246]

D. The First Person Executed by Nitrogen Hypoxia: The Case of Kenneth Eugene Smith

Kenneth Eugene Smith, an Alabama death row inmate who was scheduled for execution by lethal injection on November 17, 2022.[247] After hours of unsuccessful attempts to establish IV lines, the execution was terminated.[248] Smith reported experiencing extreme physical and psychological pain as a result of the failed attempt.[249] In response to this botched execution,[250] Smith filed declaratory and injunctive relief against state officials and individuals involved.[251] He claimed the first botched attempt caused unconstitutional pain and that a second attempt, particularly by lethal injection, would violate his Eighth and Fourteenth Amendment rights.[252] Smith argued that the execution team acted with deliberate indifference by repeatedly attempting IV access despite knowing it was

241. *Id*; *see also* Smith v. Hamm, 144 S. Ct. 414, 414–15 (2024) (Sotomayor, J., dissenting) (noting that one of Smith's experts warned of a significant risk that Smith would suffer nausea and vomiting during his execution, potentially causing him to asphyxiate on his own vomit before losing consciousness due to hypoxia. Additionally, because Alabama does not require an air-tight seal on the mask, Smith has presented a serious risk that oxygen may enter, leading to complications such as a persistent vegetative state, stroke, or suffocation, thereby increasing his suffering and prolonging his death.).
242. *But see* Copeland, Parr, & Papas, *supra* note 202 (emphasizing the logistical advantage of nitrogen hypoxia's independence from the offender's cooperation).
243. Gorvett, *supra* note 50 (noting that one significant issue with nitrogen hypoxia is its reliance on the prisoner's cooperation; if the prisoner holds their breath or breathes too shallowly, the process may take considerably longer to cause death).
244. *Id.*
245. Emma Farge, *First U.S. Nitrogen-gas Execution may Constitute Torture—UN Rights Office*, REUTERS (Jan. 16, 2024, 8:42 PM), https://www.reuters.com/world/us/first-us-nitrogen-gas-execution-may-constitute-torture-un-rights-office-2024-01-16/. *See also*, Ta-Nehisi Coats, *The Inhumanity of the Death Penalty*, https://www.theatlantic.com/politics/archive/2014/05/the-inhumanity-of-the-death-penalty/361991/ (last visited Feb. 7, 2025).
246. *Id.*
247. Smith v. Hamm, No. 2:22-CV-497, 2023 U.S. Dist. LEXIS 114853 at *1 (M.D. Ala., July 5, 2023).
248. *Id.*
249. *Id.* at *1–2.
250. *Id.*
251. *Id.* at *2, 40.
252. *Id.* at *2.

difficult and that nitrogen hypoxia was a more humane and feasible alternative.[253] Smith proposed nitrogen hypoxia as a practical and easily implemented alternative method of execution, arguing that it would have significantly minimized the risk of pain by eliminating the need for needles.[254] He claimed that nitrogen hypoxia could have avoided the pain and distress caused by the failed IV attempts.[255]

Justice Alito, who emphasized in *Glossip v. Gross* that the Eighth Amendment requires not the complete elimination of pain, but the absence of undue risk of pain in executions,[256] denied Smith's application for a stay of execution.[257] In opposing execution by nitrogen hypoxia, Smith argued that Alabama's untested nitrogen hypoxia protocol posed an unconstitutional risk of cruel and unusual punishment.[258] The Supreme Court has never invalidated a state's chosen procedure for carrying out a sentence of death on the grounds of cruel and unusual punishment.[259] This precedent suggests that nitrogen hypoxia is likely to withstand judicial scrutiny despite its controversies and untested nature.

The denial of Smith's stay of execution drew a vigorous dissent from Justice Sotomayor, who highlighted the severe physical and psychological toll the failed execution attempt had taken on Smith[260] and raised significant concerns about the risks posed by Alabama's untested nitrogen hypoxia protocol.[261] Specifically, Sotomayor stated that Smith suffered from posttraumatic stress caused by his failed execution attempt.[262] Citing his medical records, she noted that Smith experienced worsening bouts of nausea and vomiting, which had been resistant to prescribed medications.[263] She highlighted expert testimony indicating a substantial risk that Smith would have vomited during the execution, potentially asphyxiating on his vomit due to the combined effects of oxygen deprivation and posttraumatic stress.[264]

Amnesty International UK then condemned the execution of Smith, stating, "This execution will be carried out by nitrogen gas, a method not previously used, on a man who was subjected to a cruel botched execution attempt just 14 months ago."[265] Smith, therefore, became the first person

253. *Id.* at *15–16.
254. *Id.* at *22.
255. *Id.* at *16.
256. Glossip v. Gross, 576 U.S. 863, 869 (2015).
257. Smith v. Hamm, 144 S. Ct. 414, 414 (2024).
258. *Id.*
259. Baze v. Rees, 553 U.S. 35, 48 (2008).
260. *Id.*
261. *Id.*
262. *Id.*
263. *Id.*
264. Smith v. Hamm, 144 S. Ct. 414, 414 (2024).
265. *USA: 'Cruel' Nitrogen Gas Execution in Alabama must be Stopped*, AMNESTY INT'L U.K.: PRESS RELEASES (Jan. 23, 2024, 6:39 PM), https://www.amnesty.org.uk/press-releases/usa-cruel-nitrogen-gas-execution-alabama-must-be-stopped.

in U.S. history to be executed by nitrogen hypoxia.[266] Reverend Jeff Hood, who had witnessed previous lethal injection executions, described Smith's death as "the most horrible thing I have ever seen."[267] Despite claims that nitrogen hypoxia offers a quick and painless death (footnote 204), scientific analysis and firsthand accounts suggest otherwise (footnote 278). The method risks inducing intense air hunger, involuntary spasms, and psychological distress, especially in the absence of sedation. Execution protocols lack critical safeguards, and the process depends heavily on inmate compliance and system precision. Rather than eliminating suffering, nitrogen hypoxia may simply replace one flawed method with another, equally inhumane and fraught with uncertainty.

IV. THE FIRING SQUAD: A VIABLE ALTERNATIVE

This section examines the legal framework authorizing the use of the firing squad, details the procedures involved, and evaluates both medical and legal perspectives that support its effectiveness and constitutional viability.

Compared to nitrogen hypoxia, the firing squad stands out as a more reliable and arguably less painful method,[268] providing swift results with minimal suffering when performed competently.[269] For example, in *Wilkerson v. Utah*, the Supreme Court upheld a territorial court's sentence of death by firing squad, rejecting the claim that it constituted cruel and unusual punishment.[270] The Court recognized the difficulty of precisely defining what constitutes cruel and unusual punishment but made clear that methods involving torture or unnecessary cruelty are forbidden under the Eighth Amendment.[271]

A. Firing Squad Statutory Provisions: Utah's Approach

According to the Death Penalty Information Center, the states that authorize execution by firing squad are Mississippi, Oklahoma, Utah, South Carolina, and Idaho.[272] Under the Utah Code of Criminal Procedure, Chapter 18, Section 113, execution by lethal intravenous injection is required for defendants convicted of a capital felony and sentenced to death, a provision that applies to all cases on or after May 3, 2004.[273] However, Utah allows for execution by firing squad in cases where "a court explicitly recognizes and preserves the defendant's legal right to this method of

266. *Smith*, 144 S. Ct. at 414.
267. Poole & Bailey, *supra* note 216, at 1009.
268. Harold Hillman, *The Possible Pain Experienced during Execution by Different Methods*, 22 PERCEPTION 745, 750 (1993); *Smith*, 144 S. Ct. at 414.
269. Deborah W. Denno, *The Firing Squad as "A Known and Available Alternative Method of Execution" Post-Glossip*, 49 U. MICH. J. L. REFORM 749, 785 (2016); *Smith*, 144 S. Ct. at 414.
270. 99 U.S. 130, 134–35. (1879).
271. *Id.* at 135–36.
272. *Methods of Execution*, DEATH PENALTY INFO. CTR., https://deathpenaltyinfo.org/executions/methods-of-execution (last visited Feb. 4, 2025). South Carolina designates electrocution as the default method, while the other states list lethal injection as the primary method.
273. UTAH CODE ANN. § 77-18-5.5(1)(a-b) (LexisNexis 2024).

execution."[274] Subsection (3) of Section 113 addresses the constitutionality of lethal injection: "If a court rules that lethal injection is unconstitutional on its face, the firing squad becomes the default method of execution."[275] Alternatively, if the court finds lethal injection unconstitutional as applied to a specific defendant, the firing squad will be used for that individual alone.[276] Finally, Subsection (4) provides a practical safeguard: "If the state is unable to lawfully obtain the substances required to perform lethal injection, the sentencing court may order execution by firing squad."[277] This determination must occur no later than 30 days before the scheduled execution date.[278]

When the firing squad is permitted, the administrative procedure specifies how the execution is carried out.[279] Crowd control procedures in Utah ensure that individuals near the execution site are routed and managed to maintain security, safety, and the functions necessary to carry out the execution.[280] Access to the property is restricted to authorized individuals, with designated areas for demonstrations.[281] Media representatives in Utah must submit formal requests to witness executions,[282] comply with searches,[283] and follow conditions set by the Department, including restrictions on reporting until other media have been informed.[284]

The procedure for the firing squad further specifies that the executive director, or a designee, selects a five-person team of peace officers,[285] who will be compensated as determined by the director of the Division of Finance.[286] Executions are usually conducted at midnight.[287] The inmate is brought to Utah's execution chamber, which is designed for both lethal injections and firing squad executions.[288] For the firing squad, a chair is positioned against one wall and surrounded by sandbags; on the opposite wall, a canvas-covered opening, approximately twenty feet away, allows the squad to aim their rifles.[289] The inmate is secured to the chair with leather straps, and a pan is placed below the chair to catch any blood.[290] A

274. UTAH CODE ANN. § 77-18-5.5(2)(a-b) (LexisNexis 2024).
275. UTAH CODE ANN. § 77-18-5.5(3)(a) (LexisNexis 2024).
276. UTAH CODE ANN. § 77-18-5.5(3)(b) (LexisNexis 2024).
277. UTAH CODE ANN. § 77-18-5.5(4) (LexisNexis 2024).
278. *Id.*
279. UTAH CODE ANN. § 77-19-10(3-6) (LexisNexis 2024).
280. UTAH ADMIN. CODE r. 251-107-3(1)(a)–(d) (LexisNexis 2023).
281. UTAH ADMIN. CODE r. 251-107-3(4) (LexisNexis 2023).
282. UTAH ADMIN. CODE r. 251-107-3(a) (LexisNexis 2023).
283. UTAH ADMIN. CODE r. 251-107-7(3)(f) (LexisNexis 2023).
284. UTAH ADMIN. CODE r. 251-107-7(5)(b) (LexisNexis 2023).
285. UTAH CODE ANN. §77-19-10(3) (LexisNexis 2024).
286. UTAH CODE ANN. § 77-19-10(4) (LexisNexis 2024).
287. Christopher Q. Culter, *Nothing Less than the Dignity of Man: Evolving Standards, Botched Executions and Utah's Controversial Use of the Firing Squad*, 50 CLEV. ST. L. REV. 335, 363 (2002–03).
288. *Id.* at 364.
289. *Id.*
290. *Id.* at 361. The chair was modified with holes in the bottom, resembling a strainer, to allow blood to drain into a pan beneath the seat. *Id.*

doctor marks the heart by attaching a white circular target to the chest.[291] The firing squad fires in unison on the team leader's signal.[292] Utah Rep. Paul Ray, who sponsored the firing squad proposal, explained that the chest is targeted instead of the head because it's "a bigger target" and "usually allows for a faster death."[293]

B. Evaluating Pain: Evidence of Firing Squad Effectiveness

Because the firing squad aims through slots in a wall, targeting the heart to ensure it ruptures, prisoners die quickly from blood loss.[294] For example, in 2010, Ronnie Lee Gardner was pronounced dead just two minutes after being shot.[295] Similarly, in 1938, a Utah inmate was pronounced dead after two and a half minutes, despite his heartbeat ceasing only 15.6 seconds after the bullets struck.[296] In this rare instance of human experimentation, the inmate allowed doctors to record an electrocardiogram (ECG) during his execution.[297] These cases align with broader scientific evidence suggesting that a competently performed shooting can result in near-instant death with minimal pain.[298]

British scientist Harold Hillman, in one of the most comprehensive medical analyses of execution methods, concluded that the firing squad caused significantly less pain compared to other methods such as hanging, electrocution, or lethal gas.[299] Hillman observed that individuals struck by bullets often feel a sensation akin to being punched, with pain emerging only if they survive long enough to experience it.[300] He classified the pain caused by shooting as "little" to "moderate," in stark contrast to the "severe" pain associated with other execution methods.[301] Dr. James Williams, a leading expert on the firing squad, has testified extensively in court, on behalf of prisoners, never the state.[302] Drawing from his experience treating gunshot victims, training police in shooting techniques, and competing in shooting competitions, he emphasizes the physiological effects of a well-aimed execution:[303]

Going back to the Napoleonic wars, the focus was always on shooting at the heart. There is a lot of evidence that the near-instant loss of blood pressure means no blood gets to the brainstem, and there is a rapid loss of

291. *Id.* at 364.
292. *Id.*
293. Brady McCombs, *Utah's Firing Squad: How Does it Work?* ASSOCIATED PRESS (Mar. 24, 2015, 2:36 PM), https://apnews.com/general-news-58559881d0f743009cfeb52196702382.
294. *Id.*
295. *Id.*
296. Denno, *supra* note 269, at 785–86.
297. *Id.* at 786.
298. *Id.* at 785.
299. Hillman, *supra* note 268.
300. *Id.* at 745.
301. *Id.* at 749–50.
302. Maurice Chammah, *Why This Physician Testifies in Favor of the Firing Squad*, https://www.themarshallproject.org/2025/02/04/execution-firing-squad-death-penalty (last visited Feb. 7, 2025).
303. *Id.*

consciousness. You see it as well with the applied lateral carotid neck restraint, the so-called chokehold, where loss of consciousness can come in three to five seconds. I interviewed several U.S. military field medics who witnessed men shot in the heart at very close quarters, and they said, in every case, the victim stopped moving purposefully within a few seconds and did not vocalize or express that they were experiencing pain. In 1938, during a firing squad in Utah, a doctor monitored the man's heart activity, and it stopped entirely 15 seconds after the shots were fired.[304]

Noting that the firing squad was historically associated with dignity and honor in the military, often used for deserters, Dr. James Williams sees its avoidance as a cultural issue rather than a question of effectiveness.[305]

Furthermore, according to Justice Sotomayor's dissent in *Glossip v. Gross*, there is evidence to suggest that the firing squad is significantly more reliable than other methods, including the various drug combinations currently used for lethal injection.[306] In a separate case, Sotomayor, while acknowledging that some may view this method as a step backward, pointed to evidence indicating that a properly conducted firing squad execution can result in an almost immediate, painless death.[307] This view stands in contrast to Justice Blackmun's earlier warning that a return to the firing squad would reintroduce the overt bloodshed and physical violence it entails, raising distinct Eighth Amendment concerns.[308] Nonetheless, Sotomayor clarified that this does not necessarily render the method unconstitutional.[309] From the perspective of a condemned inmate, the transparent yet relatively painless nature of such violence might be far more tolerable than enduring an agonizingly painful death disguised by the pretense of medical procedures.[310]

Lastly, the chances of a botched execution by firing squad are the lowest compared to other methods.[311] In his book *Gruesome Spectacles*, Austin Sarat calculates that 7.12% of the 1,054 executions by lethal injection between 1900 and 2010 were "botched," while none of the 34 executions by firing squad during the same period experienced such failures.[312] Similarly, 5.4% of the 593 executions by lethal gas were botched, 3.12% of the 2,721 executions by hanging were botched, and 1.92% of the 4,374 electrocutions resulted in errors.[313] This data underscores that the firing squad, with a 0% failure rate,[314] has a remarkable record of reliability compared to other methods.

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304. *Id.*
305. *Id.*
306. Glossip v. Gross, 576 U.S. 863, 976 (2015).
307. Arthur v. Dunn, 580 U.S. 1141, 1154 (2017).
308. Campbell v. Wood, 511 U.S. 1119, 1121–23 (1994).
309. *Glossip*, 576 U.S. at 977.
310. *Id.*
311. SARAT, *supra* note 80, at 177.
312. *Id.*
313. *Id.*
314. *Id.*

Taken together, the legal framework, procedural clarity, scientific analysis, and historical data all support the conclusion that the firing squad offers a constitutionally sound and practically reliable method of execution. Unlike nitrogen hypoxia and lethal injection, it does not rely on uncertain drug protocols, medical personnel, or the cooperation of the condemned. When properly conducted, it produces rapid unconsciousness with minimal risk of prolonged suffering or error. These features make the firing squad not only a viable alternative but arguably a more humane and transparent one than many modern methods currently in use.

CONCLUSION

The evolution of capital punishment mirrors humanity's struggle to balance the demands of retribution with the imperatives of justice and humanity. From ancient societies' retributive practices under Hammurabi's Code to the public spectacles of Greek and Persian executions, the death penalty has long been shaped by cultural, religious, and social factors. Over time, as legal systems became more structured and humane ideals gained prominence, methods of execution shifted from overt displays of violence to more concealed and ostensibly painless approaches. Yet, as reflected in the controversies surrounding lethal injection, the gruesome accounts of electrocution, and the documented shortcomings of the gas chamber, these methods have often masked significant suffering behind a facade of progress.

The evolution of execution methods and the judicial approach to challenges under the Eighth Amendment, as articulated in *Baze v. Rees* and *Glossip v. Gross*, underscores the significant deference afforded to states in selecting execution protocols. These decisions affirm the Constitution's support for evolving humane execution methods while rejecting efforts to deem current protocols unconstitutional.

Nitrogen hypoxia, the latest addition to this evolving narrative and championed as a groundbreaking solution to the challenges of lethal injection, invites serious scrutiny regarding the scientific rigor and ethical integrity supporting its implementation. Despite claims of efficiency and painless execution, the method's foundation rests on studies conducted without medical expertise, undermining its credibility. Historical and scientific critiques, coupled with harrowing firsthand accounts, suggest that nitrogen hypoxia may fail to meet the Eighth Amendment's standard against cruel and unusual punishment. This controversy reflects broader societal discomfort with execution methods that, while cloaked in modernity, reveal more profound flaws in their conceptual and practical frameworks.

In contrast, the firing squad—rooted in historical precedent and supported by scientific evidence—offers a compelling alternative. Although it confronts societal unease with overt physical violence, its reliability, speed, and reduced likelihood of botched executions position it as a

method that aligns more transparently with constitutional standards. The firing squad's minimal error rate and swift outcomes contrast sharply with the pain and uncertainty associated with nitrogen hypoxia and other modern methods, underscoring the paradox that the most "primitive" method may also be the most humane.

The broader history of capital punishment—from its brutal and public origins to its modern-day efforts at "medicalization"—reveals a persistent struggle to reconcile justice with humanity. While modern methods aim to obscure the inherent violence of executions, they often fail to address the moral and practical contradictions of state-sanctioned death. The ongoing debate over nitrogen hypoxia and the resurgence of the firing squad underscores the need for a critical reevaluation of capital punishment itself, questioning whether any method can truly meet society's ethical and constitutional standards.