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Are Embryos or Fetuses Brain Dead? Implications for the Abortion Debate

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Most state abortion definitions exclude the removal of a dead fetus, attempting to distinguish miscarriage and abortion care. But what does "dead" mean at the earliest stages of potential life? There is a consensus at the end of life that death not only encompasses the cessation of cardiac activity, but also brain death. This symposium essay considers whether life can exist before brain life begins and how that might impact the abortion debate. The most rudimentary brain waves cannot be detected in an embryo before roughly the eighth week of pregnancy; the capacity for feeling and consciousness begin much later. If brain life starts at one of these points, one could argue that before that moment, terminating a pregnancy simply removes dead pregnancy tissue and is not an abortion according to state abortion definitions. This essay considers important critiques of this argument as a legal theory, including that the legal definition of brain death requires "irreversibility," that this strategy could exacerbate fetal personhood efforts, and that this fundamentally philosophical question cannot be resolved by science, particularly in a moment of scientific distrust. The essay concludes that though the concept of brain life has some moral and rhetorical salience, it should not be pursued as a legal strategy.

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INTRODUCTION

For decades, brain activity has been deemed a vital part of life. Though medical advances allow cardiac and respiratory activity to continue with artificial assistance, there is a national consensus that if the brain has ceased functioning, a beating heart is not life. In 1981, the Commissioners of Uniform State Laws created a model state law called the Uniform Determination of Death Act, which defined death to include "irreversible cessation of all functions of the entire brain, including the brain stem."[1] Since then, all fifty states have adopted some criteria for establishing brain death, either by statue, regulation, or judicial decision, largely following the UDDA definition.[2]

A similar consensus has not been reached about whether brain activity is also necessary for human life to begin. This essay, invited as part of a symposium on "Bioethics after *Dobbs*," hopes to bring that conversation into the post-*Dobbs* legal literature.[3] Though a few pieces of legal scholarship considered this question in the *Roe* era, they largely argued from the opposite posture: did the possibility of brain life before viability suggest that either the viability line was wrong or that personhood should begin when brain life starts.[4] This is the first piece of legal scholarship to consider the opposite question: is removing a brain-dead fetus or embryo exempt from state abortion bans?

This topic has significant implications for the abortion debate in this country. If life does not begin until brain life begins, then terminating a pregnancy before then may not fall under an abortion ban or raise the same legal or ethical concerns. For instance, most states exclude removal of a dead fetus from their state abortion

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[1] *See,* UNIFORM DETERMINATION OF DEATH ACT (Nat'l Conf. Comm'rs on Unif. State L. 1980) [Hereinafter UDDA].

[2] Nikolas T. Nikas, Dorinda C. Bordlee & Madeline Moreira, *Determination of Death and the Dead Donor Rule: A Survey of the Current Law on Brain Death*, 41 J. MED. PHILOS. 237, 240 (2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4889813/. *See* Jason L. Goldsmith*, Wanted! Dead and/or Alive: Choosing Among the Not-So-Uniform Statutory Definitions of Death*, 61 U. MIAMI L. REV. 871 (2007) (describing state variations in their definitions of death).

[3] This topic has been explored fairly extensively in the bioethics literature. *See e.g.*, John M. Goldenring, *The Brain-Life Theory: Towards a Consistent Biological Definition of Humanness*, 11 J .MED ETHICS 198 (Dec 1985); John Harris, *The Concept of the Person and the Value of Life*, 9 Kennedy Inst. Ethics J., 293-308 (1999); Lockwood, Michael. 1988. Warnock Versus Powell (And Harradine); When Does Potentiality Count? Bioethics 2: 187–213; Eric T. Olson, *Was I Ever a Fetus*, 57 PHILOSOPHY & PHENOMENOLOGICAL RESEARCH 95 (1997); BARUCH BRODY, ABORTION AND THE SANCTITY OF HUMAN LIFE: A PHILOSOPHICAL VIEW (1975).

[4] *See* Joel R. Cornwell, *The Concept of Brain Life: Shifting the Abortion Standard Without Imposing Religious Values,* 25 DUQ. L. REV. 471, 477-79 (1987); Donald Hope, *The Hand as Emblem of Human Identity: A Solution to The Abortion Controversy Based On Science And Reason*, 32 U. TOL. L. REV. 205 (2001); Ken Martyn, *Comment: Technological Advances and Roe v. Wade: The Need to Rethink Abortion Law*, 29 UCLA L. Rev. 1194 (1982); Gary B. Gertler, *Note: Brain Birth: A Proposal For Defining When A Fetus Is Entitled To Human Life Status*, 59 S. CAL. L. REV. 1061 (1986).

definitions—a necessary exception to account for miscarriage care.[5] But could this exception apply to brain dead (or brain unalive) pregnancies? And if so, when does brain life begin? After examining these complex questions, the essay considers a variety of conceptual and strategic challenges associated with embryonic or fetal brain death as a legal theory.

Section I of the essay begins by exploring the advantages of a theory of prenatal brain life. Though many Americans have intuitive feelings that the moral value of potential life grows with the pregnancy, it has been challenging to find a non-arbitrary line to explain a pregnancy's changing moral status. Brain life may provide a helpful theory, one that introduces symmetry with the end of life. Section II then explores the possible moments when brain life could begin: when the first flutter of brain activity is seen, when the fetus develops capacity for pain, or when the fetus develops capacity for consciousness. It describes the research on when those points may occur in an embryo or fetus. Finally, Section III describes the significant challenges with a legal theory of prenatal brain life, including the requirement of "irreversibility" under current definitions of death, the possibility of reinforcing legal personhood or an objective theory of fetal value that erases the pregnant person, and the scientific uncertainty and unknowability of the questions.

The essay concludes that though brain life may be a useful rhetorical device to explain why early pregnancy terminations are not unethical or problematic, there are significant obstacles to it becoming a successful legal theory. And strategically, it perpetuates a focus on the fetus to the detriment of pregnant people.

I. Brain Life: A Potential Solution to an Old Problem

Polls routinely show that support for abortion changes over the course of pregnancy. Nearly 70% of Americans support abortion in the first trimester.[6] Though support for later abortions has grown in the post-*Dobbs* era, in 2023, it still dropped to 37% in the second trimester and 22% in the third trimester.[7] Many people see the moral significance of prenatal life progressing with pregnancy. Fifty-six percent say that when it comes to abortion, it should matter how long a person has been pregnant.[8] Most Americans do not find palatable

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[5] Greer Donley & Caroline Kelly, *Abortion Disorientation*, 74 DUKE L. J. (forthcoming 2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4729217.

[6] Lydia Saad, *Broader Support for Abortion Rights Continues Post*-Dobbs, GALLUP (June 14, 2023), https://news.gallup.com/poll/506759/broader-support-abortion-rights-continues-post-dobbs.aspx.

[7] *Id.*

[8] *America's Abortion Quandary*, PEW RSCH. CTR. (May 6, 2022), https://www.pewresearch.org/religion/2022/05/06/americas-abortion-quandary/.

either absolute position—i.e., that life begins at conception, equating the life of microscopic matter to that of living people, or that life begins at birth, denying moral value to all prenatal life.

The controversies surrounding in vitro fertilization (IVF) illustrate this point further. The oft-repeated antiabortion phrase that life starts at conception has led to an abortion ban starting at conception in at least fourteen states.[9] However, the consequences of that view for IVF has significantly challenged the long-held ideology. In February 2024, the Alabama Supreme Court held that frozen embryos were "people" and "children" entitled to protection under Alabama's wrongful death law, halting many IVF services in the state.[10] Of course, the implication of the life-at-conception view is that *all* embryos—inside and outside a pregnant body—are people, and destroying those embryos is a killing.[11] Reproductive justice advocates have long warned that if personhood-at-conception became a legal reality, it would significantly harm access to IVF, where unused embryos are frequently destroyed.[12]

But the public reaction to the Alabama case was swift and almost uniformly negative, even from those who oppose abortion. Polling immediately after showed that 66% of Americans did not think that embryos were people[13] and that 86% wanted to keep IVF legal.[14] Within weeks, antiabortion republicans had passed a law insulating the fertility industry from liability related to the destruction of embryos.[15]

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[9] *State Bans on Abortion Throughout Pregnancy*, GUTTMACHER INST. (last updated Apr. 12, 2024), https://www.guttmacher.org/state-policy/explore/state-policies-later-abortions.

[10] *LePage v. Ctr. for Reprod. Med., P.C.*, No. SC-2022-0515, 2024 WL 656591 at *7 (Ala. Feb. 16, 2024), reh'g denied, No. SC-2022-0515, 2024 WL 1947312 (Ala. May 3, 2024).

[11] For an antiabortion perspective on the logical inconsistency of banning abortion while failing to protect IVF embryos, see David French, *The Great Hypocrisy of the Pro-Life Movement*, NY TIMES (Apr. 11, 2024), https://www.nytimes.com/2024/04/11/opinion/pro-life-alabama-trump.html.

[12] For a great discussion of how reproductive justice advocates warned that IVF would suffer from a personhood-at-conception legal framework, see Maya Manian, *Lessons from Personhood's Defeat: Abortion Restrictions and Side Effects on Women's Health*, 75 OHIO ST. L. J. 1 (2013).

[13] Adriel Bettelheim, *Frozen Embryos Shouldn't Be Considered People, Two-Thirds of Americans Say*, AXIOS (last updated Feb. 28, 2024),https://www.axios.com/2024/02/28/alabama-ivf-ruling-poll-ipsos.

[14] Miranda Nazzaro, *Overwhelming Majority of Americans Support Keeping IVF Legal for Women: Poll*, THE HILL (Mar. 4, 2024, 5:15 PM), https://thehill.com/policy/healthcare/4507514-overwhelming-majority-americans-support-keeping-ivf-legal-for-women-poll/#:~:text=The%20poll%2C%20released%20Sunday%20by,it%20should%20not%20be%20legal.

[15] S.B. 159, 2024 Leg., Reg. Sess. (Al. 2024); *See also,* Adam Edelman, *Alabama Senate and House Pass Bills to Protect IVF After Court Ruling*, NBC NEWS (Feb. 29, 2024, 3:58 PM), https://www.nbcnews.com/politics/alabama-senate-house-pass-bills-protect-ivf-rcna141184.

In other words, even the most hardline antiabortion legislators refused to endorse an unequivocal view that embryos were people or that life begins at conception. Indeed, as Glenn Cohen argued in his published remarks for the symposium, it should have been *easier,* not harder, for antiabortion legislators to affirm the value of conceived life when a pregnant person's bodily autonomy interests are not also implicated.[16] But it is a tall task to convince the public that the contents of a Petrie dish—no matter how valuable they are to potential parents—are equivalent to a living human being.

On the other hand, only 18% of Americans in 2022 believed that life starts at birth,[17] and only 19% thought abortion should be legal in all situations without exception.[18] Despite this common intuition that the moral or legal value of prenatal life grows during pregnancy, it has been challenging to find a reasoned, non-arbitrary line to explains it. Famously, the Supreme Court created one: viability, or the point at which a fetus is reasonably likely to survive outside the womb.[19] But the line has been criticized by people on all sides of the spectrum for a variety of reasons.[20] The trimester lines, arbitrarily created, also have little normative value in explaining when the worth of a pregnancy fundamentally changes.[21]

Brain life might provide a better way to recognize the moral worth of prenatal life at the end of pregnancy, but not at the beginning.[22] As noted in the introduction, society has long rejected that circulation or respiration, without brain activity, is life at all.[23] Rather, some brain activity or capacity for consciousness is required for life to

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[16] [Editors: I think Glenn's comments are being published? If so, could you add in a cite?]; *See also* Glenn Cohen, *Reproductive Technologies and Embryo Destruction After* Dobbs 8, (Harv. Pub. L. Working Paper, Paper No. 23-03, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4284007.

[17] Linley Sanders, *When Does Human Life Begin?*, YOUPOLL (April 13, 2022), https://today.yougov.com/politics/articles/42105-when-does-human-life-begin-poll.

[18] *America's Abortion Quandary, supra* note 8.

[19] *Roe v. Wade,* 410 U.S. 113, 160 *(*1973)*, overruled by* Dobbs v. Jackson Women's Health Org.*,* 597 U.S. 215 (2022); Planned Parenthood of S.E. Pennsylvania v. Casey*,* 505 U.S. 833 *(*1992), *overruled by* Dobbs v. Jackson Women's Health Org.*,* 597 U.S. 215 (2022)

[20] *See Dobbs*, 597 U.S. 113, 274-77; Julia Longoria, *Part 1: The Viability Line*, WNYC STUDIOS (June 8, 2023), https://www.wnycstudios.org/podcasts/radiolabmoreperfect/episodes/part-1-viability-line.

[21] *See* David A. Grimes, *Abortion Jabberwocky: The Need for Better Terminology*, 89 CONTRACEPTION 93 (Oct. 21 2009) ("The trimester concept stems from obstetrical mythology; dividing a pregnancy into three equal segments has no basis in embryology or science").

[22] Importantly, to me, moral worth and personhood are distinct things—I am referring only to the former, not the later, as discussed in more depth below. *See generally*, Donley & Lens, *infra* note 110, at Y.

[23] *See* UDDA*, supra* note 1.

continue.[24] That idea may have the same force at the beginning of life and explain why an embryo—an organism that is simply a bundle of cells, with nothing that resembles a brain—is not yet alive in any way we normally think of the term. Even after cardiac activity is visualized, the embryo is still weeks away from any potential marker of brain life. Therefore, like in the IVF lab, these unalive pregnancies may be discarded from a pregnant person's body without recourse.

Under this view, in the earlier stages of pregnancy, when most abortions occur, a pregnancy termination is simply removing a brain-dead embryo from its life support: the pregnant person.[25] In other words, there is not yet any life being destroyed when a pregnancy is terminated before brain life begins. It is more akin to miscarriage care—the removal of an unalive embryo or fetus. As explored in more depth below, there might also be a legal hook: thirty-five states define abortion to exclude the removal of a dead fetus, calling into question whether removing a brain-dead fetus or embryo is an abortion at all or subject to a state's abortion laws.[26] This could be a non-arbitrary line that is both intuitive and symmetrical with the law at the end of life, perhaps creating a more reasoned way to distinguish early and later pregnancies.

The abstract idea, however, is much more complex in application. Even at the end of life, there is tremendous scholarly disagreement about how significant the brain failure must be to declare someone dead.[27] But the *law* has reached a fairly clear consensus: brain death is the absence of activity in the entire brain, including the brain stem.[28] Many have argued that this requirement is too strict, that brain life ends even with less comprehensive damage—for instance, when the capacity for consciousness is lost, even if the brain maintains some function.[29] In thinking through when brain life begins, those same questions are worth considering. Does brain life begin at the first moment of brain activity, no matter how rudimentary? When is a fetus's brain is developed enough to feel pain? Or when there is some possibility for consciousness? These are different points in the pregnancy continuum, which would have significant impacts on the abortion question. The next section explores these possible moments and when they might occur.

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[24] *Id.*

[25] *See generally*, Greer Donley, *Parental Autonomy over Prenatal End-of-Life Decisions*, 105 MINNESOTA L. REV. 175, 231-234 (2020) (arguing that abortion resembles removing life-support).

[26] Donley & Kelly, *supra* note 5.

[27] *See e.g.,* Peter Singer, *The challenge of brain death for the sanctity of life ethic*, Ethics & Bioethics 8, No. 3-4 153, 153- 165 (2018), https://doi.org/10.2478/ebce-2018-0012.

[28] *See* UDDA, *supra* note 1.

[29] *See e.g.,* Singer, *supra* note 27; *The Definition of Death*, THE STANFORD ENCYCLOPEDIA OF PHILOSOPHY, https://plato.stanford.edu/archives/spr2017/entries/death-definition/.

II. When Might Brain Life Begin?

There are a few different moments that could mark the beginning of brain life.[30] This essay considers three: (1) the first moment of any brain activity, (2) the capacity for feeling or pain, (3) the capacity for conscience. As discussed below, each have their own advantages and disadvantages. Notably, there appears to be at least some scientific disagreement on when each of these points begin. I lack the expertise to resolve scientific disputes, but I do my best to outline the literature and places of substantial agreement. At the end of the section, I address whether a brain life definition that is symmetrical with the end of life is necessary.

a. The First Moment of Brain Activity

Perhaps the most obvious choice for when brain life begins would be the first appearance of activity anywhere in the brain. This would mirror UDDA's criteria: if brain life ends when there is no brain activity in any portion of the brain, brain life may begin when the first flicker of brain activity appears.[31]

It appears that the earliest, rudimentary brain activity can be detected around eight to nine weeks of pregnancy. The antiabortion group, the Charlotte Lozier Institute, claims that the earliest, recorded evidence of EEG waves in an embryo was at 8 weeks and 3 days gestational[32] age.[33] Given the Institute's antiabortion mission, this moment will likely set the bounds of the earliest possible moment for brain life to begin. Remember: it is not until the sixth week of pregnancy that the neural tube—the earliest part of the brain and spine—closes, and not until the seventh week of pregnancy that a head begins to develop.[34] Notably, at this moment, the pregnancy is still an embryo; it becomes a fetus after the tenth week.[35] Also around eight weeks, the earliest embryonic movements can be discerned, potentially

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[30] Others have argued the development of hands, which allows for the hand-brain complex and occurs as the embryo turns into a fetus after 10 weeks, should be the moment. Hope, *supra* note 3, at 216.

[31] *See* Nikas et al., *supra* note 2; Goldsmith et al, *supra* note 2.

[32] Gestational age refers the length of pregnancy measured from the woman's last menstrual period—i.e., two weeks before conception occurred. Thus, eight gestational weeks is really six weeks since conception.

[33] *Brain Activity in the Unborn*, CHARLOTTE LOZIER INST. (last updated June 20, 2023), https://lozierinstitute.org/dive-deeper/brain-activity-in-the-unborn/.

[34] *Fetal Development: The First Trimester*, MAYO CLINIC (June 3, 2022), https://www.mayoclinic.org/healthy-lifestyle/pregnancy-week-by-week/in-depth/prenatal-care/art-20045302.

[35] *Id.*

indicating brain stem activity.[36] These factors combined have led some doctors and philosophers to argue that eight weeks is the moment when brain life begins.[37]

Though there seems to be general agreement that some brain activity and embryonic movement can be detected starting in the eighth week of pregnancy,[38] the activity and movements are extremely rudimentary. "The first synapses to be described in the human nervous system have been at eight weeks' gestation, although these are very few and far between and they are unlikely to be functional."[39] The first embryonic movements "have been called 'just discernible movements' and have been described as a slow and small shifting of the fetal contours lasting ½ to 2 [seconds], usually as a single event."[40] Though the presence of brain activity and embryonic movement may seem dispositive, a closer examination reveals significant complexity.

At the end of life, whether EEG activity or spontaneous movement on their own is enough to halt a brain death characterization has been deeply debated. The majority view is that they should not. Starting with EEG activity, the American Association of Neurologists (AAN) in 2023 specifically said: "Clinicians should not use EEGs, AEPs, or SEPs as ancillary tests to assist with the diagnosis of" brain death.[41] However, in a notable case, *In Re Guardianship of Hailu*, the Nevada Supreme Court refused to endorse the AAN's view that EEG activity was insufficient evidence of brain life.[42] In that case, the court refused to find that a patient was brain dead when there was evidence of EEG activity, even though she failed the AAN's tests for brain life. The court remanded to the lower court, noting that other

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[36] *See* Annemarie B Lüchinger et al., *Fetal Onset of General Movements*, 63 PEDIATR. RES. 191 (2008), https://www.nature.com/doifinder/10.1203/PDR.0b013e31815ed03e (last visited Mar 29, 2024); J. I. P. de Vries & B. F. Fong, *Normal Fetal Motility: An Overview*, 27 ULTRASOUND OBSTET. GYNECOL. 701 (2006), https://onlinelibrary.wiley.com/doi/abs/10.1002/uog.2740 (last visited Mar 29, 2024); Pennti Joupplia, *Fetal Movements Diagnosed by Ultrasound in Early Pregnancy*, 55 AOGS 131 (1976), https://obgyn.onlinelibrary.wiley.com/doi/epdf/10.3109/00016347609156800.

[37] *See e.g.,* John M. Goldering, *The Brain-Life Theory: Towards a Consistent Biological Definition of Humanness*, 11 J. MED. ETHICS 198 (1985); Kirsten Rabe Smolensky, *Defining Life from the Perspective of Death: and Introduction to the Forced Symmetry Approach*, 3 U. Chicago L. Forum 41 (2006) ("Brain Birth I" places brain birth at 8 weeks); D. Gareth Jones, *Brain Birth and Personal Identity*, 15 J. MED. ETHICS 173, 174-75 (1989), https://www.jstor.org/stable/27716842 (last visited Mar 30, 2024) (describing a handful of scholars that have argued for brain life to begin at eight weeks).

[38] For a review of the literature on the emergency of brain activity, *see id. But see* Jones, *supra note* X (suggesting that the first EEG brain waves are detected at 14 weeks); Smolensky, *supra* note 24 at 70 (arguing that it occurs at 12 weeks). For a review of the literature on the emergence of embryonic movements, *see supra* note 36.

[39] Jones, *supra* note 64, at 177.

[40] Lüchinger et al., *supra* note 36, at 191.

[41] David M. Greer et al., *Pediatric and Adult Brain Death/Death by Neurologic Criteria Consensus Guideline*, 101 NEUROLOGY 1112 (2023) [Hereinafter AAN Guidelines].

[42] *In re Guardianship of Hailu*, 131 Nev. 892, 900-903 (2015).

guidelines from Harvard required a flat EEG as a confirmatory test.[43] Notably, the Harvard guidelines were promulgated by an ad hoc group without institutional backing in 1968 and have never been updated.[44]

EEG activity is often deemed insufficient evidence of brain life on its own because it is not correlated with functionality—i.e., the ability to breathe, think, feel, or move. When considering those same concerns at the beginning of life, one commentator has noted that we should also be wary of early EEG activity in embryos: "This activity, however, is not coherent activity of the kind that underlies human consciousness, or even the coherent activity seen in a shrimp's nervous system. Just as neural activity is present in clinically brain-dead patients, early neural activity consists of unorganized neuron firing of a primitive kind."[45] Thus, an embryo's earliest EEG activity may be inconclusive of brain life on its own.

The same is true of the primitive embryonic movement. Notably, a significant portion of brain-dead people have some spasmic movements after death, ranging from 39%[46] to 75%[47] of brain-dead patients. The AAN also does not require the cessation of all movement to determine death, but the Harvard guidelines do.[48] The AAN's view is that a movement must be responsive to stimuli and not just reflexive: "Retained spinally mediated reflexes can be seen in the setting of [brain death]. . . It can sometimes be challenging to determine whether a movement is cerebrally or spinally mediated based solely on the clinical examination. When such difficulties arise, review with more experienced clinicians may be helpful."[49] Thus, movement on its own may simply be reflexive or spontaneous and not be indicative of life.

Though the AAN guidelines are the predominate ones used to determine death—and do not ask clinicians to consult EEGs or observe spontaneous movements—practically speaking, the AAN's tests for determining death are impossible to conduct on an embryo. One cannot touch, manipulate, or examine the embryonic body for responses to stimuli.[50] One cannot shine a light in the undeveloped

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[43] *Id.* at 904.

[44] *See* Robert M. Veatch, *Would a Reasonable Person Now Accept the 1968 Harvard Brain Death Report? A Short History of Brain Death*, HASTINGS CENTER REP. (2018), https://onlinelibrary.wiley.com/doi/10.1002/hast.943.

[45] Michael S. Gazzaniga, *'The Ethical Brain'*, NY TIMES (June 19, 2005), https://www.nytimes.com/2005/06/19/books/chapters/the-ethical-brain.html.

[46] *Spontaneous Movements Often Occur After Brain Death*, AM. ACAD. NEUROLOGY (Jan. 13. 2000), https://www.sciencedaily.com/releases/2000/01/000113080008.htm.

[47] Suk-Geun Han, Gyeong-Moon Kim, Kwang Ho Lee, Chin-Sang Chung, & Ky-Young Jung, *Reflex Movements in Patients with Brain Death: A Prospective Study in a Tertiary Medical Center*, 21 J. KOREAN MED. SCI. 588 (2006).

[48] AAN Guidelines, *supra* note 41; Doyen Nguyen, *Evolution of the Criteria of "Brain Death": A Critical Analysis Based on Scientific Realism and Christian Anthropology*, 86 LINACRE Q. 297 (2019).

[49] AAN Guidelines, *supra* note 41.

[50] *Id.* (recommending an evaluation of particular reflexes in response to stimuli).

eyes[51] to see if pupils dilate.[52] Even for full term infants, it is challenging to determine brain death, and the AAN guidelines specifically don't apply to premature babies born before 37 weeks for this reason.[53] As a result, some will argue that the Harvard Guidelines, which do rely on EEGs and movements as confirmatory evidence of brain life, must be our guidepost. If so, this suggests that brain life has begun when EEG and reflexive movements are present, particularly since the timing of their onset coincides around the eighth week of pregnancy.

For those skeptical of these early milestones, it's worth noting that embryonic movement does develop quickly after it begins. Typically, in the middle of the ninth week, the majority of embryonic movements "show a substantial degree of variation in speed, amplitude, participating body parts, and direction."[54] Also in the ninth week, suck and swallow movements can be seen, and by ten weeks, the embryo starts to demonstrate a breathing movement.[55] By eleven weeks, when an embryo becomes a fetus, twins can be seen responding to one another in the womb.[56] The suck, swallow, and breathing movements, in particular, would likely satisfy even the AAN guidelines,[57] so the difference in potential brain life onset between the two guides is likely only a week or two apart.

The Uniform Law Commission started the process of updating the model UDDA's definition of death in 2021.[58] One possibility is moving towards a definition that centers on functionality. Prominent scholars have argued that the definition should be changed to "permanent loss of the capacity for consciousness, the ability to breathe spontaneously, and brainstem reflexes."[59] This change would

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[51] Kathleen Scogna, *How Your Baby's Eyes and Vision Develop in the Womb*, BABYCENTER (Jan. 20, 2022), https://www.babycenter.com/pregnancy/your-baby/how-your-babys-eyes-and-vision-develop-in-the-womb_20004926.
[52] AAN Guidelines, *supra* note 41.
[53] Greer, *supra* note 59.
[54] *Id.*
[55] De Vries & Fong, *supra* note 36, at 704.
[56] *Id.*
[57] AAN Guidelines, *supra* note 41 (testing reflexes to breathe or gag).
[58] *Determination of Death Committee*, UNIFORM LAW COMMISSION (2021), https://www.uniformlaws.org/committees/community-home?communitykey=a1380d75-62bc-4a5b-ba3a-e74001a9ab57; *See also* Doyen Nguyen, *Does the Uniform Determination of Death Act Need to Be Revised*, 87 LINACRE Q. 317 (2020); Ariane Lewis, *The Legal Definition of Death Needs to Be Clearer*, SCI. AM. (Feb. 14, 2024), https://www.scientificamerican.com/article/the-legal-definition-of-death-needs-to-be-clearer/.
[59] Adam Omelianchuk et al., *Revise the Uniform Determination of Death Act to Align the Law With Practice Through Neurorespiratory Criteria*, 98 NEUROLOGY 532 (2022), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8967425/ (last visited Mar 29, 2024). *See also* David M. Greer et al., *Determination of Brain Death/Death by Neurologic Criteria: The World Brain Death Project*, 324 JAMA 1078 (2020), https://jamanetwork.com/journals/jama/fullarticle/2769149 (last visited Mar 29, 2024). ("BD/DNC is defined as the complete and permanent loss of brain function

move away from a definition that requires the cessation of *all* brain activity, particularly as the Harvard Guidelines interpretated it. One impact of this new definition, if effectuated,[60] would be to codify the AAN view that brainstem reflexes, not brainstem activity, are what matter. As noted above, the typical tests for evaluating brainstem reflexes, which evaluate the body's response to external stimuli, are impracticable or impossible to conduct on an embryo, so it is hard to know how this change would affect the determination of brain life if a symmetrical definition were used. It might move the goalpost back a few weeks to when movements seem less spontaneous and more responsive.

Though eight to nine weeks is early in pregnancy—only four to five weeks after a pregnancy can be diagnosed, and when an embryo is only 16 mm long—a brain life standard that begins then might still have impact. More than half are completed before the eighth week of pregnancy, and roughly two-thirds of abortions are completed before the ninth week.[61] If the standard moved to ten weeks, it would capture nearly three quarters of abortions.[62] If brain life, and therefore life itself, does not begin until that moment, then removing those pregnancies may not be abortions at all. Rather, they mimic miscarriage care: removing a dead fetus. If this theory were able to restore access to pregnancy termination before this moment throughout the country, it could have a significant impact in this post-*Dobbs* environment.

b. Capacity for Higher Brain Functioning

Thus far, the essay has considered the UDDA's definition of death, applied to the beginning of life. But not everyone agrees that brain death should be based on the absence of *all* brain function. Philosophers and legal scholars have long questioned whether something greater, like the capacity for consciousness, is necessary for life.[63] In their view, death is the absence of the ability to feel or think, even if one still breathes.

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as defined by an unresponsive coma with loss of capacity for consciousness, brainstem reflexes, and the ability to breathe independently.")

[60] The Commission "paused its process" in 2023 "because the group could not reach consensus." Rob Stein, *Debate simmers over when doctors should declare brain death*, NPR (Feb. 11, 2024), https://www.opb.org/article/2024/02/11/debate-simmers-over-when-doctors-should-declare-brain-death/.

[61] These numbers are extrapolated from raw CDC data. Kevin Drum, *Raw Data: Abortions By Week of Pregnancy*, MOTHER JONES (April 29, 2019), https://www.motherjones.com/kevin-drum/2019/04/raw-data-abortions-by-week-of-pregnancy/.

[62] *Id.*

[63] *See e.g.,* David Randall Smith, *Legal Recognition of Neocortical Death*, 71 Cornell L. Rev. 850 (1986) (arguing that "neocortical death should be considered the death of the person for legal purposes").

One might argue the same point here: rudimentary brain activity is not enough to declare that life has begun. There must be some evidence that the fetus has capacity to feel or think before true brain life starts. Some scholars have suggested that there are two kinds of brain death: higher brain death and whole brain death.[64] The former involving the permanent loss of consciousness despite brain stem function; the latter involving the loss of all brain functioning.[65] Some have suggested that the beginning of life also involves two distinct moments: the beginning of inanimate life—akin to plants growing—and the beginning of animate life—akin to consciousness or the creation of an entity.[66] This requires the existence of a more developed brain, capable of higher brain functioning.

Below, I explore two alternative points where brain life could be declared: the development of the capacity for pain—a proxy for the capacity to feel—and the development of the capacity to think.

i. Capacity for Pain

Another potential point along the development spectrum where brain life might occur is when fetuses develop the capacity for pain. Pain is a construct of the brain and cannot be felt until the brain has reached a certain level of development.[67] Capacity for pain not only speaks to brain development but also serves an independent purpose for those who worry about fetal pain during an abortion. When fetuses develop the capacity for pain is contested outside of the mainstream medical community.

The mainstream scientific consensus is that "the capacity for conscious perception of pain can arise only after thalamocortical pathways begin to function, which may occur in the third trimester around 29 to 30 weeks' gestational age, based on limited data available."[68] It is also during these weeks that EEG patterns of fetuses show wakefulness, which many think is a precondition to the experience of pain.[69] When one is unconscious, pain is typically not perceived.[70] Though there is some evidence that pain receptors start to

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[64] D. Gareth Jones, *The Problematic Symmetry Between Brain Birth and Brain Death*, 24 J. MED. ETHICS 237 (1998).
[65] *Id.*
[66] *See e.g.,* Thomasine Kushner, *Having a Life versus Being Alive.* 10 J. MEDICAL ETHICS 5, 6 (1984) ("It is clear that until it has developed a brain capable of consciousness the fetus's biography is not yet started. There is no life (bios) of which the fetus is the subject").
[67] Susan J. Lee et al., *Fetal PainA Systematic Multidisciplinary Review of the Evidence*, 294 JAMA 947, 948 (2005), https://doi.org/10.1001/jama.294.8.947.
[68] *Id.* at 952.
[69] *Id.*
[70] Hugo Lagercrantz, *The Emergence of Consciousness: Science and Ethics*, 19 SEMIN. FETAL. NEONATAL MED. 300 (2014) ("It is important to distinguish between the states of

develop around 24 weeks, many argue there is no functional pathway to recognize that pain until weeks later.[71]

Nevertheless, ACOG and other major medical organizations have made 24-25 weeks the critical moment for pain perception:

> The science conclusively establishes that a human fetus does not have the capacity to experience pain until after at least 24–25 weeks. Every major medical organization that has examined this issue and peer-reviewed studies on the matter have consistently reached the conclusion that abortion before this point does not result in the perception of pain in a fetus.[72]

Interestingly, capacity for pain, when pinpointed at 24 weeks, is remarkably close to the viability line that dominated abortion law for nearly five decades. But the justification for that line is different.

Antiabortion groups have used the possibility of fetal pain to justify abortion bans at fifteen-, twenty-, or twenty-two-weeks' gestation. The Charlotte Lozier Institute argues that "[u]nborn babies can feel pain at least by 15 weeks gestation and possibly earlier."[73] Their argument relies, in part, on fetal response to stimuli. For instance, a fetus might move away from or flinch from an amniocentesis needle. The mainstream medical community, however, rejects the view that response to stimuli is evidence of pain, noting that the "neural circuitry necessary to distinguish touch from painful touch does not, in fact, develop until late in the third trimester."[74] Indeed, people flinch from loud noises or surprising touches that are not painful. So just because a fetus might react to stimuli does not mean that they perceive stimuli as painful. Antiabortion groups also note that it is the standard of care to provide anesthesia to fetuses before prenatal surgeries starting at 15 weeks; without it, there is evidence of a stress response, like rising cortisol.[75] The mainstream scientific community has responded that there are other reasons to recommend fetal anesthesia during fetal surgery, including to stop fetal movement before surgery on a fetus.[76]

Nevertheless, some scholars outside of the antiabortion movement have recently questioned some of the conclusions about fetal pain, arguing that it is theoretically possible for pain to begin as

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consciousness, i.e. wakefulness, sleep, coma, and general anaesthesia versus the content of consciousness.").

[71] Lee et al., *supra* note 67, at 948.

[72] *Facts Are Important: Gestational Development and Capacity for Pain*, ACOG https://www.acog.org/advocacy/facts-are-important/gestational-development-capacity-for-pain.

[73] *Fact Sheet: Science of Fetal Pain,* CHARLOTTE LOZIER INST. https://lozierinstitute.org/fact-sheet-science-of-fetal-pain/.

[74] *Facts Are Important: Gestational Development and Capacity for Pain*, *supra* note 72.

[75] *Fact Sheet: Science of Fetal Pain, supra* note 73.

[76] *Facts Are Important: Gestational Development and Capacity for Pain*, *supra* note 72.

early as twelve weeks.[77] They do not argue that fetal pain *is* perceived at any moment, only that it may be possible. They question the assumptions baked into the 24-25 week timeline—namely, that the development of the cortex was required for pain perception.[78] In humility, it may be worth acknowledging that there are still many unknowns about the experience of pain even in adults.[79] But hypotheses are not facts, and a theoretical possibility of pain is not evidence of pain.

If capacity for pain were the determining moment for brain life and therefore the permissibility of abortion, it would cast a spotlight on the science underlying that determination. As discussed in Section III below, science has limitations and may not be able to answer every question. But for now, the overwhelming majority endorses the view that capacity to feel pain develops after 24-25 weeks.

ii. Capacity for Consciousness

Though there is certainly no agreed upon understanding of consciousness,[80] "[a] simple definition of consciousness is awareness of the body, oneself and the outside world."[81] Most people believe that the cerebral cortex is instrumental to any conscious thought or sense of self.[82] And some brain life theorists argue that consciousness is the key to brain life: "until it has developed a brain capable of consciousness the fetus's biography is not yet started. There is no life (*bios*) of which the fetus is the subject."[83] But when the brain is developed enough to generate consciousness is unknown and deeply debated.

Some argue that consciousness could begin as early as brain activity is seen in the cerebral cortex. This activity typically occurs around the same timeframe of capacity for pain perception. For

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[77] Stuart WG Derbyshire & John C. Bockmann, *Reconsidering Fetal Pain*, 46 J. MED. ETHICS 3 (2020), https://jme.bmj.com/content/46/1/3 (last visited Mar 30, 2024).
[78] *Id.*
[79] *See e.g.,* Patrick Boyle, *The Science of Pain: What is it and why is it so Hard to Measure?,* (June 27, 2023), https://www.aamc.org/news/science-pain-what-it-and-why-it-so-hard-measure; Anne Case et. al, *Decoding the Mystery of American Pain Reveals a Warning for the Future*, 117 PNAS 24785 (2020), https://doi.org/10.1073/pnas.2012350117; David G. Blanchflower & Alex Bryson, *Further Decoding the Mystery of American Pain: The Importance of Work*, PLOS ONE (2020), https://journals.plos.org/plosone/article?id=10.1371/journal.pone.026189; Kari Karos, *The Enduring Mystery of Pain in a Social Context*, 66 J. Adolescent Health 623 (2020).
[80] *See e.g.,* Thomas Nagel, *What Is It Like to Be a Bat?*, 83 PHILOSOPHICAL REV., 435 (1974).
[81] Lagercrantz, *supra* note 70.
[82] *But see* Moussa & Shannon, *supra* note 98, at 34 (critiquing the modern view that understanding the brain will reveal answers to "what is consciousness.").
[83] Kushner, supra note 66, at 6.

instance, the neocortex begins producing EEG waves around 22-24 weeks.[84] "Assuming that consciousness is mainly processed in the cerebral cortex, the thalamocortical connections must be established. This does not occur until around gestational weeks 23–25."[85] Some also point to habituation, which is a form of short-term memory, developing around 22-23 weeks.[86] For instance, a fetus will start to remember a sound that previously made it startle.

Others argue that more time is needed to really see the type of development necessary in that part of the fetal brain to establish true consciousness: "Most researchers thus place conscious activity as occurring sometime between the twenty-ninth and thirty-fifth week."[87] It is not until then that "synchrony of the electroencephalographic (EEG) rhythm across both cortical hemispheres signals the onset of global neuronal integration."[88] Additionally, some note that "EEG activity does not to begin to establish an adult pattern until 32-36 weeks."[89] And it is not until the 32nd week that "the fetal brain is in control of breathing and body temperature."[90]

However, other researchers go further, suggesting that consciousness cannot truly begin until birth. They note that much of the above research is based on premature babies, which cannot be equated with fetuses at the same gestational age. They argue that before birth, the fetus is rarely awake, suggesting to some that consciousness is not possible: "A first conclusion of this ongoing research is that the fetus in utero is almost continuously asleep and unconscious partially due to endogenous sedation."[91] Under this theory, "the fetus is actively sedated by the low oxygen pressure (equivalent to that at the top of Mount Everest), the warm and cushioned uterine environment and a range of neuroinhibitory and sleep-inducing substances produced by the placenta and the fetus itself."[92] It is the "dramatic events attending delivery" that "cause the brain to abruptly wake up."[93]

Given the ambiguities in both defining consciousness and determining whether and when a fetus develops it, it might be

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[84] Jones, *supra* note 37, at 175.
[85] Lagercrantz, *supra* note 70.
[86] *Id.*
[87] Smolensky, *supra* note 38, at 78 (citing Jennifer A. Burgess and S.A. Tawia, *When did you first begin to feel it? Locating the Beginning of Consciousness*, 10 Bioethics 1, 20 (1996)).
[88] Christof Koch, *When Does Consciousness Arise in Human Babies?,* SCIENTIFIC AMERICAN (Sept. 1, 2009), https://www.scientificamerican.com/article/when-does-consciousness-arise/.
[89] Jones, *supra* note 37, at 177.
[90] Gazzaniga, *supra* note 45.
[91] Hugo Lagercrantz & Jean-Pierre Changeux, *The Emergence of Human Consciousness: From Fetal to Neonatal Life*, 65 PEDIATR. RES. 255 (2009), https://www.nature.com/articles/pr200950 (last visited Apr 1, 2024).
[92] Koch, *supra* note 88.
[93] *Id.*

particularly challenging to reach any scientific consensus on if and when this moment begins.

c. Should Definitions for Brain Death and Brain Life be Symmetrical?

Under the UDDA and state corollaries, the legal moment for determining death is when the entire brain stops functioning, suggesting that life exists with activity present anywhere in the brain.[94] As described above, even modern efforts to revise the death standard, which are a little more relaxed, would still require the absence of brain stem reflexes to declare death even if higher brain functioning has permanently ceased. Though philosophers, bioethicists, and lawyers still debate whether higher brain functioning should be required for life, at least for now, this is an academic debate only—the law is clear.[95]

Some have argued that the only way for a legal definition of brain life to be seen as non-arbitrary or apolitical is to force symmetry with the end of life.[96] Kirsten Rabe Smolensky has argued that no matter which definition of death is accepted, it must be applied equally and symmetrically at the beginning of life: "the forced symmetry approach assumes that the legal definitions of life and death should be connected to one another in some meaningful way. . . . Engaging in this exercise highlights the logic, or illogic, of particular arguments being made in the abortion debate."[97] Under this theory, symmetry is the most important factor, and brain life should begin at the inverse of brain death: when any brain activity can be detected. If the definition of brain death shifts to account for higher brain death, then the definition of brain life should shift with it. But using different standards for brain life and death may lead to accusations of political meddling and undermine its perceived non-arbitrariness. Many philosophers agree that symmetry is crucial.[98]

Though symmetry is intuitive, there are reasons to reject it—namely, that brain birth and brain death are not the same. Death can only occur after life, so it may be nonsensical to talk about brain death for an entity that has never been alive. Proponents of symmetry, therefore, "overlook[] all the ways in which the end of life differs from its beginning."[99] One important distinction is biological: that death recognizes disintegration while life requires integration: "The

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[94] UDDA, *supra* note 1.
[95] *The Definition of Death, supra* note 29.
[96] Smolensky, *supra* note 38, at 84 (arguing that symmetry between the beginning of life and end of life is important).
[97] *Id.* at 66.
[98] *See* Mario Moussa & Thomas A. Shannon, *The Search for the New Pineal Gland Brain Life and Personhood*, 22 HASTINGS CENTER REP., 30, 32, 34-35 (1992) (describing various philosophers who have made this argument).
[99] *Id.* at 36.

disintegration might be instantaneous and final—as a result, say, of trauma—whereas the integration is always gradual, making the idea of discrete stages of neural development very dubious."[100] Similarly, if brain death requires the loss of the ability to think, feel, *and* react to stimuli, maybe life requires the integration of all three factors together, not just the onset of one. More granularly, the definitions might differ by necessity because society cares about different values when we think about death verses life. As discussed below, the current definition of death requires "irreversible" brain function, a concept that is inapposite to defining the beginning of life, where the lack of function is never permanent. In other words, it may be hard or insincere to create one definition that applies perfectly to both poles.

But beyond these biological distinctions, there is a more critical difference between the beginning and end of life: only at the beginning of life is another person's body implicated. A brain death standard impacts the people who could be declared dead, but a brain life standard has the potential to impact not only the embryo or fetus, but the pregnant person as well. Some early brain life proponents who equated brain life with personhood were explicit in their view that the uterus can be seen as an "intensive care unit" necessary to preserve brain alive fetuses and embryos.[101] Under this view, the pregnant body is erased: "One practical consequence of this metaphysical sleight of hand is to make pregnant women simply irrelevant to the issue of abortion."[102]

Mario Moussa and Thomas A. Shannon also underscore another distinction in the brain life and brain death standards—the practical reasons that spurred them. One of the early motivating factors for the creation of the brain death standard was to increase the number of organs for donation.[103] On the other hand, early brain life theorists immediately connected their work to restricting abortion rights.[104] Moussa and Shannon argue that "the difference in agendas should be discussed openly, as part of the debate over 'brain life,' for only in this way can its full social significance be understood."[105] In other words, exposing the purposes underlying the philosophical debate undercuts the façade of political neutrality. This essay also began with political goals in mind. Though strategic motivations do not necessarily invalidate the inquiry on either side, it's unclear whether the scientific inquiry can be divorced from the political implications,

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[100] *Id.*
[101] *Id.* (describing Gondenring).
[102] *Id.*
[103] *Id.* at 35
[104] *Id.*
[105] *Id.*

as explored in more depth below. If it cannot be, then it is less clear that symmetry for the sake of political neutrality will achieve its goal.[106]

III. Challenges with Brain Life as a Legal Theory

In thinking through the concept of brain life as legal strategy to support abortion rights, there are both opportunities and significant challenges. Brain life may have moral or persuasive force, and state definitions of abortion create statutory opportunities. But conceptual and practical concerns may outweigh the possible benefits. I address three of these concerns below: (1) the UDDA's definition requires irreversibility—a standard unlikely to be met for brain birth; (2) brain life as a theory may reinforce fetal personhood or an objective theory of fetal value, which on the whole, harms the abortion rights movement more than helps it; and (3) the concept of brain birth relies on scientific disputes that, in the age of disinformation and distrust in science, will be particularly hard to navigate. An honest evaluation of the science may reveal that brain birth occurs over time, not at a singular moment, questioning whether it can offer any true answers to the moral questions sought.

a. Abortion Definitions, the UDDA, and Irreversibility

Every state has its own definition of abortion.[107] One tricky part of defining abortion is that common miscarriage management practices could be included.[108] Abortion and miscarriage rely on the same procedures and medications—the only difference being whether they are used on a "live" or "dead" embryo or fetus.[109] In an attempt to avoid an overbreadth problem, most states (and nearly all states with abortion bans) define abortion to exclude "removal of a dead" fetus.[110] Thus, there is an opening to argue that, as a matter of statutory law, death in this context means either circulatory or brain death, as it does at the end of life.

Notably, determining death, even outside of brain death, is a complex process early in pregnancy. A large number of pregnancies—as high as 30%--end in pregnancy loss.[111] Though some losses are straightforward, many are not. The most common miscarriage symptoms, bleeding and cramping, are not diagnostic as they are also

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[106] *C.f., Medical Evidence and Expertise*, *supra* note 133, at 4 ("Given the transformation in the development and use of medical evidence and expertise, I argue that progressive lawyering strategies on the issue of abortion should delink legal advocacy from its nearly absolute reliance on "evidence based approaches.").
[107] Donley & Kelly, *supra* note 5, at Y.
[108] *Id.* at 10.
[109] *Id.*
[110] *Id.* at 45.
[111] *Id.* at 24.

present in roughly 25% of healthy pregnancies.[112] Sometimes the first sign of a miscarriage is an early ultrasound that is measuring weeks behind, but this may also be the result of inaccurate menstrual dating. Before cardiac activity has been documented, when most miscarriages occur, the only way to evaluate fetal death with certainty is to provide recurrent ultrasounds over the course of 11-14 days.[113] Some miscarriages will resolve on their own in the meantime, but others will require treatment to complete.[114] One devastating side-effect of *Dobbs* has been the impacts on miscarriage care: providers are often delaying or denying treatment for miscarriage to diagnose embryonic death with certainty at the expense of pregnant patients.[115] And the delays in care have led to tragic consequences.[116]

Perhaps brain death could make this easier: early in pregnancy when most miscarriages happen, the embryo would be brain dead and can be removed without recourse. So too with healthy early pregnancies. But there is a significant obstacle here: in interpreting the meaning of "removal of a dead fetus" in the abortion definitions, courts would likely turn to the state definitions of death that were based on the UDDA. And the UDDA defines brain death to require "irreversible cessation" of brain activity.[117] Though "irreversible" and "cessation" are typically undefined, the embryo's potential for future development may make this statutory scheme inapt.

This language may not be dispositive. For instance, one could argue that the lack of brain functioning in an embryo is irreversible in that brain life has never begun in the first place, so it cannot be "reversed." Professional organizations, like AAN, or agencies charged with interpreting state health regulations could even place a thumb on the scale toward such an interpretation. But for a statute written with death in mind, that may not be the most natural reading of the statute. Indeed, some newer model language instead uses the term "permanent," suggesting that embryos or fetuses could never be brain dead as their lacking brain function is not permanent.[118] As noted above, the beginning and end of life may simply be asymmetrical to the end.

Certainly, one could imagine a new model statute that seeks to define the beginning of brain life, as distinct from its demise, but it is hard to imagine it being successful in states where it matters. Indeed, many antiabortion legislatures have already passed laws declaring life

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[112] *Id.*

[113] *Id.* Notably, the standard of care does not demand certainty, but a patient-centered approach that defers to the pregnant patient. Abortion bans have made it difficult for providers to feel like they can follow this standard of care. *Id.*

[114] *See id.* at 25-27.

[115] *Id.* at 22-31.

[116] *Id.*

[117] UDDA, *supra* note 1.

[118] *See e.g.,* Omelianchuk, *supra* note 59.

to start at conception or implantation, rejecting this view.[119] These laws could be used to trump even an enacted UDDA definition by suggesting that the legislature has declared all zygotes, embryos, and fetuses alive, and therefore not dead regardless of the state's definition of death. It's unlikely that any state with an abortion ban—the states this essay most concerns—would pass a law that opens the door for early pregnancy terminations on the basis of brain death.

b. *Personhood and Objective Fetal Value*

Outside of the statutory interpretation challenges, there is also a significant strategic issue with a legal theory of brain life: the personhood movement. There is also a normative concern: whether the abortion rights movement should endorse any objective valuation of the fetus.

The antiabortion movement has been arguing for decades that embryos and fetuses are entitled to full constitutional rights as legal persons from the moment of conception.[120] This is one of their strategies to try to end abortion nationwide without having to pass a new federal law.[121] Though a theory of brain life could theoretically be useful for establishing a *de facto* national abortion right by allowing pregnancy terminations before brain life begins, it might also lend support to the idea that after that point, fetuses are persons entitled to constitutional rights. In other words, brain life might not only be a floor below which abortion can occur everywhere, but a ceiling above which abortion may not occur anywhere.

Some scholars and religious thinkers have already argued this point.[122] Indeed, the small amount of legal scholarship to consider fetal brain life, which occurred in the decades where *Roe* and *Casey* were the default, argued from this posture—i.e., that the beginning of brain life is either the beginning of personhood or the beginning of when a state's interest in fetal life trumps the pregnant person's such that the state should be able to ban abortion.[123] Given the current makeup of the federal judiciary, particularly in the Supreme Court and in states

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[119] Sarah Varney, *When Does Life Begin? As State Laws Define it, Science, Politics and Religion Clash,* NPR (Aug. 27, 2022), https://www.npr.org/sections/health-shots/2022/08/27/1119684376/when-does-life-begin-as-state-laws-define-it-science-politics-and-religion-clash.

[120] *See, e.g.,* Mary Zeigler, *The Endgame in the Battle Over Abortion*, (March 24, 2024), POLITICO https://www.politico.com/news/magazine/2024/03/24/personhood-abortion-legal-fight-00147138.

[121] *Id.*

[122] *See* Cornwell, *supra* note 4, at 477-79 (arguing that brain life begins at eight weeks and would impose a national right to abortion before eight weeks and a national ban after).

[123] Donald Hope, *supra* note 4; Martyn, *supra* note 4; Nancy K. Rhoden, *The New Neonatal Dilemma: Live Births from Late Abortions*., 72 GEO. L.J. 1451 (1984); Gertler, *supra* note 4.

where abortion bans are common, it is much more likely that the concept of brain life would be referenced to promote personhood than to promote abortion rights.

Certainly, one could and should respond to this line of argument by noting that personhood is a legal term of art that is functionally distinct from life. Zoe Robertson has outlined how many living things, including some human beings, are considered nonpersons in some contexts, while some non-living things, like corporations, are considered constitutional persons in others.[124] Precedent has made clear that life and personhood are distinct. Brain life is only about life, not personhood. Antiabortion state law seems to support this conclusion as well. Though many states define life as beginning at conception, most of them do not grant full personhood status to embryos or fetuses, particularly those outside of a pregnant person's body.[125] Even the Alabama legislature—one of the most antiabortion in the country—was unwilling to endorse such a view, passing legislation that would allow embryos to be routinely destroyed without consequence or concern.[126] Nevertheless, the potential slippery slope from brain life to personhood is worth considering seriously.

A related concern is equally salient: should the abortion rights movement endorse any objective valuation of the fetus? Jill Wieber Lens and I have previously criticized an objective view of fetal value, noting that the antiabortion concept of personhood-at-conception "is based on biology—it is fixed and objectively presumed for all pregnancies at conception" and "erases the pregnant person's subjective experience of pregnancy."[127] The idea of brain life repeats this mistake: the laser focus on fetal biology erases the pregnant person and tries to establish the fetus's worth apart from her. Instead, Lens and I argue that fetal value is subjective and relational—the pregnant person defines its value. In our view, there should be no fixed, transformative moment in fetal development because every person's experience with every pregnancy is different. In one pregnancy, what

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[124] Zoe Robinson, *Constitutional Personhood*, 84 GEO. WASH. L. REV. 605, 632-45 (2016) (analyzing several Supreme Court cases that have limited the constitutional rights of individuals who are felons or aliens); Hannah Robert, *The Bereavement Gap: Grief, Human Dignity and Legal Personhood in the Debate over Zoe's Law,* 22 J.L. & MED. 319, 320 (2014) (noting that personhood "has a legal meaning which includes some non-humans (such as corporations), and excludes some humans. Its purpose is not to define human life, but to enable an autonomous interaction with the law.").

[125] For instance, South Carolina defines "unborn child" as "an individual organism of the species homo sapiens from conception until live birth" but still allows abortion up to six weeks and does not restrict IVF or birth control methods that might disrupt a fertilized egg from implantation. S.C. Code Ann. § 44-41-610.

[126] *See* text and notes accompanying notes 10-15.

[127] Greer Donley & Jill Wieber Lens, *Abortion, Pregnancy Loss, and Subjective Fetal Personhood,* 75 VAND. L. REV. 1649, 1694-95 (2022).

may feel like a clump of cells may, in another pregnancy, feel like a child. This is a topic I am developing further in future work.

But it is obvious that when the focus of the abortion conversation is the fetus, women and pregnant people are losing. They are invisible. There is a great deal of effort to focus the public's attention on the fetus to the exclusion of the person whose body is laboring to carry it. Brain birth perpetuates this trend and would therefore play into the hands of the antiabortion movement. This does not mean the fetus should be ignored or considered meaningless, but that its worth cannot be summed up in biological milestones. Thus, even if the statutory interpretation challenges could be avoided, there are normative reasons to avoid the brain life argument.

c. Scientific Uncertainty and Unknowability

The concept of brain life requires answers to two important questions: what is the determining factor of brain life and when does it begin? Both questions have sparked controversy at the end of life. Even attempts to slightly modify the UDDA to focus on whole brain function, not whole brain activity, stalled because the group could not reach a consensus.[128] But the stakes and political maneuvering at the beginning of life would be much more complicated to navigate. The science would be debated *ad nauseam*. Even in the *Roe* era, when fetal pain was legally irrelevant, it became a flashpoint as states tried to legislate around it.[129]

Abortion exceptionalism has a way of calling into question even the most well studied scientific conclusions. Rachel Rebouche has described how the antiabortion movement cast aspersions on the safety of mifepristone—one of the most studied and safe drugs on the planet—in a meritless case that made it all the way to the Supreme Court.[130] Antiabortion activists have long worked in the opposite direction too: legitimizing junk science. Aziza Ahmed has tracked how the antiabortion movement successfully used a dubious test (the "floating lungs test") to criminalize self-managed abortion patients;[131] inaccurate risk claims to fearmonger abortion patients during

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[128] Stein, *supra* note 60.

[129] *See* Kavita Shah Arora & Christina Salazar, Fetal Pain Legislation, AMA J. Ethics (Oct. 2014), https://journalofethics.ama-assn.org/article/fetal-pain-legislation/2014-10.

[130] Rachel Rebouche, *Facts on Trial:* Alliance for Hippocratic Medicine v. FDA *and the Battle over Mailed Medication Abortion*, Colorado L. Rev (2024) ("Since Roe was decided, abortion debates have been waged on the terrain of contested expertise and facts").

[131] Aziza Ahmed, *Floating Lungs: Forensic Science in Self-Induced Abortion Prosecutions*, 100 BOSTON U. L. REV. 1111 (2020) [Hereinafter *Floating Lungs*].

"informed consent,"[132] and even "intuition" about abortion regret to uphold a ban on a particular abortion procedure.[133]

Ahmed has argued that reversions to science can obfuscate ideology, as if science is a politically neutral enterprise.[134] But feminists have long showed how bias can manipulate science in intentional and unintentional ways.[135] And Ahmed notes that in the context of abortion, it has become clear that science can not only be ideologically motivated, but that the very judges called to evaluate "facts" will both see them through their ideological lens and legitimize the version of the truth they want in their opinions.[136] Scientific "facts"—whether they are true, false, or somewhere in between—then become the basis for evaluating what is, at core, a moral question: "although courts acknowledge the moral and scientific complexity of determining whether or not there was a life, they lose sight of it in a world in which guilt or innocence rides on a truth claim."[137] The concept of brain life is no different: it "cloak[s] a philosophical controversy in the robes of science and, thereby, conceal the difficult ethical issues at stake."[138]

The scientific questions concerning the emergence of brain life are muddy at best and unknowable at worst. People fully engaged in this work have questioned whether it is possible, even in theory, to define one singular moment when the brain awakens: "'The overwhelming impression of brain development is that of *gradualness* – and also of the staggered manner in which the brain comes into being. . . . What follows from that, at present at least, it is impossible to recognize a distinct point of transition from a 'non-brain' to a 'brain.'"[139] Indeed: "no single essential difference can distinguish one 'moment' in neuromaturation from another. Differences there certainly are, but none that by itself requires a distinct physiological

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[132] Aziza Ahmed, Abortion in a Post-Truth Moment: A Response to Erwin Chemerinsky and Michele Goodwin, 95 Tex. L. Rev 198, 201 (2017) [Hereinafter *Abortion in a Post-Truth Moment*].

[133] Aziza Ahmed, *Medical Evidence and Expertise in Abortion Jurisprudence*, 41 Am. J. L. & Medicine, 85, 107-11 (2015) [Hereinafter *Medical Evidence and Expertise*].

[134] *See Medical Evidence and Expertise, supra* note 133, at 110; *Floating Lungs, supra* note 131, at 1148; Rebouche, *supra* note 130, at 29 ("This example matters because it tests the assumptions that evidence is apolitical, neutral, or settled; that evidence is separate from law; and that healthcare policy will be better if based only on evidence and not on politics, as if the two could be untangled.")

[135] *Medical Evidence and Expertise, supra* note 133, at 112-14.

[136] *Id.* at 88 ("Understanding the complicated role of medical evidence in adjudication requires an exploration of how courts and lawmakers use medical expertise and evidence to code the political projects of courts, how medical experts with conflicting opinions legitimate themselves through participating in adjudication, and how medical expertise and evidence constrains judicial decision-making.").

[137] *Floating Lungs, supra* note 131, at 1147.

[138] Moussa & Shannon, *supra* note 98, at 35.

[139] Donley & Lens, *supra* note 127, at 176.

category of its own."[140] Hard cases at the end of life often reveal a similar, uncomfortable truth: that death is often a process, not a moment.[141] This problem is only more salient at the beginning of life because the brain's "integration is always gradual," where its disintegration can be sudden after trauma.[142] In this way, it may be like a Sorites Paradox (also known as the Paradox of the Heap), where the addition of "no single grain of wheat can make the difference" between a heap and non-heap, even though at some moment, we recognize that a heap was created out of individual pieces.[143]

Thus, this essay circles back to the same question it started with: is there really a point in pregnancy where everything changes—where the fetus is one thing one moment and another the next? If not, we are back to the original position of drawing arbitrary lines to make sense of the unknown. Brain life may be no more helpful than viability. Were this question to have legal relevance, the scientific questions would be debated in the national consciousness with a public incapable of fully evaluating the evidence. And the whole focus of the conversation would be on the fetus, not the pregnant person.

CONCLUSION

In this new post-*Dobbs* terrain, considering novel avenues for supporting abortion rights is critical: "this current moment calls for creativity and boldness in litigation and advocacy."[144] The theory of brain life may be seen as a non-arbitrary line that supports pregnancy termination before the moment where brain life begins: it would not be an abortion to remove a brain-dead embryo or fetus from a pregnant person because it is not alive. This idea may have intuitive value for those who believe a pregnancy's moral worth develops over time.

But there are significant challenges. Choosing the moment where brain life begins will be fraught. The debate will center around scientific conclusions and uncertainties at a time when trust in science is low. Practically speaking, the existing definitions of brain death are inapposite to brain life, and some state legislatures have already

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[140] Moussa & Shannon, *supra* note 98, at 32.

[141] *See* Rachel Aviv, *What Does It Mean to Die?*, NEW YORKER (Jan. 29, 2018), https://www.newyorker.com/magazine/2018/02/05/what-does-it-mean-to-die (describing the case of Jahi McMath); *In re Guardianship of Hailu*, 131 Nev. 892, 900-903 (2015) (describing the case of Aden Hailu).

[142] Moussa & Shannon, *supra* note 98, at 36.

[143] *Sorites Paradox*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY (March 26, 2018), https://plato.stanford.edu/entries/sorites-paradox/#EmbrPara.

[144] *See* David S. Cohen, Greer Donley & Rachel Rebouche, *Rethinking Strategy after Dobbs*, 75 STANFORD L. REV. ONLINE (2022) ("New ideas should be aired, considered, and—if there is a plausible argument to support them—tested in some form or other. . . .").

declared that life begins at conception. There are also legitimate concerns that brain life as a legal theory could inadvertently support the fetal personhood movement or inappropriately move the reproductive rights movement toward an objective view of fetal value that erases the pregnant person. In the end, the scientific evidence seems ill equipped to answer the philosophical questions underlying the inquiry of when life begins.