COMMONWEALTH OF KENTUCKY
SUPREME COURT OF KENTUCKY
No. 2022-SC-0329
(Consolidated with Nos. 2021-SC-519, -520, -522)

DANIEL CAMERON, in his official capacity as
Attorney General of the Commonwealth of Kentucky,

Appellant,

v.

EMW WOMEN'S SURGICAL CENTER, P.S.C.,
on behalf of itself, its staff, and its patients, *et al.*,

Appellees.

Court of Appeals, No. 2022-CA-0906;
Jefferson Circuit Court, No. 22-CI-03225

BRIEF OF *AMICI CURIAE* MAUREEN L. CONDIC, PH.D. AND
THE CHARLOTTE LOZIER INSTITUTE SUPPORTING APPELLANT

Gene C. Schaerr (PH29325028)
Scott D. Goodwin (PH29330829)
Cristina Martinez Squiers (PH29370604)
Annika M. Boone (PH29331129)
SCHAERR | JAFFE LLP
1717 K Street NW, Suite 900
Washington, DC 20006
Telephone: (202) 787-1060
gschaerr@schaerr-jaffe.com

Bryan H. Beauman (86968)
333 West Vine Street, Suite 1500
Lexington, KY 40507
Telephone: (859) 255-8581
Facsimile: (859) 231-0851
bbeauman@sturgillturner.com

Counsel for Amici Curiae *Maureen L. Condic, Ph.D. and*
The Charlotte Lozier Institute

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was served, via first class U.S. mail, postage prepaid, on the 4th day of October 2022 to the following:

Matthew F. Kuhn, Solicitor General
Office of the Attorney General
700 Capital Avenue, Suite 118
Frankfort, Kentucky 40601

Michele Henry
Craig Henry PLC
401 West Main Street, Suite 1900
Louisville, Kentucky 40202

Brigitte Amiri
Chelsea Tejada
Faren Tang
ACLU Foundation
125 Broad Street, 18th Floor
New York, New York 10004

Heather L. Gatnarek
ACLU of Kentucky
325 Main Street, Suite 2210
Louisville, Kentucky 40202

Wesley W. Duke
Office of Secretary, Cabinet for Health and Family Services
275 East Main Street SW-A
Frankfort, Kentucky 40621

Carrie Flaxman
Planned Parenthood Federation of America
1110 Vermont Avenue, NW, Suite 300
Washington, D.C. 20005

Leah Godesky
Kendall Turner
O'Melveny & Myers LLP
1999 Avenue of the Stars
Los Angeles, California 90067

Leanne Diakov
Kentucky Board of Medical Licensure
310 Whittington Parkway, Suite 1B
Louisville, Kentucky 40222

Thomas B. Wine
Jason B. Moore
Office of the Commonwealth's Attorney
30th Judicial Circuit
514 West Liberty Street
Louisville, Kentucky 40202

Clerk, Kentucky Court of Appeals
360 Democrat Drive
Frankfort, Kentucky 40601

Clerk, Jefferson Circuit Court
600 West Jefferson Street
Louisville, Kentucky 40202

Respectfully submitted,

Co-Counsel for Amici Curiae

STATEMENT OF POINTS AND AUTHORITIES

PURPOSE OF BRIEF AND INTEREST OF AMICI CURIAE

Amicus Dr. Maureen Condic, who compiled the scientific material presented in Section II of this brief, is a faculty member in the University of Utah School of Medicine who has taught Human Embryology for over 20 years and has studied fetal consciousness and pain in great depth.[1] *Amicus* Charlotte Lozier Institute (CLI), in which Professor Condic serves as an associate scholar, is a nonprofit research and education organization committed to bringing modern science to bear in life-related policy and legal decision-making. Both *amici* believe that laws governing abortion should be informed by the most current medical and scientific knowledge on human development.

INTRODUCTION

A legal framework that fails to address mounting evidence of the fetus's humanity and independent, subjective experience is wholly inadequate to balancing any necessarily qualified right to abortion against the compelling interest in protecting what, from the earliest stages of development, is patently living and human. It is no longer possible to avoid grappling directly with overwhelming evidence revealing the fetus to be neither a legal abstraction nor an object of convenience, but a human being whose sentience implicates the highest protections of human law.

I. The human fetus is a remarkable, living organism with much more sophisticated capacities and abilities than were understood 50 years ago.

For example, there is and can be no debate that performing an abortion during any stage of pregnancy, beginning at fertilization, ends the life of a human being. At

[1] Dr. Condic appears in her individual capacity; this brief does not represent the views or positions of the university that employs her. Further, as a non-lawyer, Dr. Condic offers no opinions on the legal matters addressed outside of Sections I and II of this brief.

fertilization, when a sperm combines with an egg, a single-celled human (the zygote) is created, which contains every instruction necessary for the zygote to develop to adulthood.[2] The "cells, tissues and organs produced during development do not somehow 'generate' the embryo … they are produced *by the embryo* as it directs *its own* development to more mature stages of human life."[3] This organized, coordinated behavior is "the defining characteristic of a human organism."[4]

As illustrated in video,[5] all of the embryo's major organs begin to form within the first five weeks after fertilization. Eighteen days after conception, scientists observe the first signs of the developing brain.[6] In the fourth week after fertilization, the heart starts beating[7] and will beat approximately 54 million times before birth.[8] The respiratory system begins forming at the end of the fourth week,[9] and by the end of the fifth week, the brain has developed separate left and right cerebral hemispheres, which will direct speech, decision-making, movement, balance, vision, memory, and other functions.[10]

The embryo starts moving at seven to eight weeks, and these movements are

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[2] Sadler, T. W. (2019). *Langman's Medical Embryology* (14th ed.) (p. 14).
[3] Condic, M. (2014, June 11). *A scientific view of when life begins.* Charlotte Lozier Institute. https://lozierinstitute.org/a-scientific-view-of-when-life-begins/ (emphasis in original).
[4] *Id.*
[5] *See* The Voyage of Life, available at: https://lozierinstitute.org/voyage/.
[6] Sadler, T. W. (2019). *Langman's Medical Embryology* (14th ed.) (pp.336-337).
[7] *Id.* at 60.
[8] The Endowment For Human Development. *Prenatal form and function: Appendix – The beat goes on.* https://www.ehd.org/dev_article_appendix.php#beatgoeson.
[9] Moore, K. L., *et al.* (2018). *The developing human: Clinically oriented embryology* (11th ed.) (p.395).
[10] O'Rahilly, R., & Müller, F. (2008). Significant features in the early prenatal development of the human brain. *Annals of Anatomy, 190*(2), 105-118.

essential to the formation of joints and muscle tone.[11] By the seventh week, brain cells have connected. The embryo now responds to a light touch on her lips or cheeks by reflexively moving away.[12]

The embryonic period ends at the eighth week, when more than 90% of the body parts have formed, including hands, fingers, and toes.[13] At nine weeks, the unborn child is officially recognized as a fetus, and it starts exhibiting more complex behaviors such as thumb-sucking, swallowing, and stretching.[14] The fetus's nerve receptors in her face, hands, and feet allow her to sense and respond to light touch. Shortly thereafter, the child develops the neural structures necessary and sufficient for a conscious awareness of pain.

II. Technological and medical advances have greatly expanded scientific understanding of fetal consciousness and capacity for suffering.

Although researchers have been interested in the cognitive and social behaviors of the fetus since the late 1800s, the nature of pregnancy obscured direct observation. More rigorous investigations of fetal behavior only became possible at the end of the 20th century "with the development of fetal physiological monitoring technology and innovations in ultrasound technology."[15] In particular, 4D ultrasonography created an unprecedented tool

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[11] Hepper, P. (2005). Unraveling our beginnings. *The Psychologist*, *18*(8), 474-477.
[12] Hooker, D. (1952). *The prenatal origin of behavior*; Humphrey, T. (1964). Some correlations between the appearance of human fetal reflexes and the development of the nervous system. *Progress in Brain Research*, *4*, 93-135.
[13] O'Rahilly, R., & Müller, F. (2001). *Human Embryology & Teratology* (3rd ed.) (p. 87)).
[14] Liley, A. W. (1972). The foetus as a personality. *Australian and New Zealand Journal of Psychiatry*, *6*(2), 99-105; de Vries, J. I. P., Visser, G. H. A., & Prechtl, H. F. R. (1982). The emergence of fetal behavior I. qualitative aspects. *Early Human Development*, *7*(4), 301-322.
[15] Ferrari, G. A., *et al.* (2016). Ultrasonographic investigation of human fetus responses to maternal communicative and non-communicative stimuli. *Frontiers in Psychology, 7*, at 1-2.

for studying fetal behavior and opened entirely new fields of research including "fetal neurology," "fetal psychology," and "fetal neurobehavior."[16] These tools provide a far better understanding of fetal consciousness and pain than was available before this century.

A. Scientific Advances Demonstrate Fetal Consciousness From Early In The Second Trimester.

These modern technological advancements have allowed researchers to confirm fetal consciousness by directly observing fetal behavior, including reactions to external stimuli, and then comparing that objective behavior to the behavior exhibited in human infants, adults, and animals having a conscious experience of the same stimuli.[17]

There is now clear evidence based on ultrasonographic observations that fetuses as early as 12 weeks[18] exhibit conscious, intentional behavior, and that they actively discriminate among similar sensory experiences:

- For example, as early as 14 weeks, after fetal auditory structures have formed, fetuses distinguish between music and mere vibroacoustic noise that stimulates the same auditory pathways, exhibiting a spike in activity and mouth movements only for music.[19]
- Fetuses at 23 weeks of life distinguish nursery rhymes with the syllable "LA" from

[16] Grigore, M., *et al.* (2018). The role of 4D US in evaluation of fetal movements and facial expressions and their relationship with fetal neurobehaviour. *Medical Ultrasonography*, *1*(1), 88-94, 88.
[17] *See, e.g.*, López-Teijón, M., *et al.* (2015). Fetal facial expression in response to intravaginal music emission. *Ultrasound*, *23*(4), 216-223, 217.
[18] Throughout, references to the developmental age of the fetus are given in weeks since sperm-egg fusion (post-fertilization age). For gestational age based on the last menstrual period (LMP), add two weeks.
[19] López-Teijón, *supra* note 17, at 216-23 (ultrasound video available with online version of article at http://ult.sagepub.com).

rhymes with the syllable "LU."[20]

- Similarly, fetuses as young as 19-23 weeks selectively respond to and distinguish between different types of external stimulation, displaying more intentional—and perhaps communicative—movement in reaction to maternal abdominal touch versus maternal speaking.[21]

Besides facial expressions, hand and arm movements also provide evidence for conscious and active planning by the pre-viability fetus:

- At least as early as 20 weeks, fetal hand movements towards the mouth and eye are straighter and less jerky, and through acceleration and deceleration reveal planned hand movement appropriate to the relative size and delicacy of the target. Thus, by that age, fetuses "show the recognizable form of intentional actions, with kinematic patterns that depend on the goal of the action, suggesting a surprisingly advanced level of motor planning."[22]
- Ultrasonography on fetal twins not only buttresses the evidence of intentional fetal movements, but also shows a social dimension to that capacity at an even earlier stage of gestation. Fetuses as young as 12 weeks consistently demonstrate longer movement duration and deceleration time for movements directed at their twin compared to those directed at either themselves or at the uterine wall. Further, these other-directed movements increase with gestational age even as self-directed

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[20] Ferrari, *supra* note 15, at 3-8.
[21] Marx, V., & Nagy, E. (2015). Fetal behavioural responses to maternal voice and touch. *PLoS ONE*, *10*(6), at 1-15.
[22] Zoia, S., *et al.* (2007). Evidence of early development of action planning in the human foetus: A kinematic study. *Experimental Brain Research*, *176*(2), 217-226, 217.

movements decrease. Thus, fetal movements "specifically aimed at the co-twin" evince fetal capacity for "social actions" as early as 12 weeks and confirm that such movements are intentional rather than random.[23]

These studies suggest that early fetal behavior—as early as 12 weeks—is neither accidental nor merely reflexive. Instead, they demonstrate a pre-viability fetus's conscious awareness of its environment, active discrimination among similar sensory experiences, and intentional—even social—planning of physical actions. These studies thus show that, from early in the second trimester, a fetus has an active, subjective experience that is comparable to other forms of sentient human life.

B. Scientific Evidence Demonstrates That Fetal Capacity For Suffering Also Arises Early In The Second Trimester.

Besides the proliferating evidence of fetal consciousness, scientific advances show that the fetus can and does experience pain from early in the second trimester. New research methods have generated overwhelming evidence that neurocircuitry present from early in the second trimester is sufficient for both consciousness and suffering, while direct observations of fetal behavior confirm that the fetus consciously reacts to painful stimuli.

There is longstanding, effectively universal scientific agreement that connections between the fetus's spinal cord and the subcortical nuclei in the thalamus region of the brain begin to form between 12 and 18 weeks.[24] In the past, however, many espoused the unproven theory that conscious fetal suffering was impossible before the development of

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[23] Castiello, U., *et al.* (2010). Wired to be social: The ontogeny of human interaction. *PLoS ONE*, *5*(10), 1.

[24] Kostovic, I., & Goldman-Rakic, P. S. (1983). Transient cholinesterase staining in the mediodorsal nucleus of the thalamus and its connections in the developing human and monkey brain. *Journal of Comparative Neurology*, *219*(4), 431-447.

thalamocortical and intracortical circuitry beginning at about 22 weeks. For example, Dr. Stuart Derbyshire, a neuroscientist and pro-choice consultant who has written extensively on fetal pain since 1994,[25] was until recently considered "a leading voice against the likelihood of fetal pain,"[26] based chiefly on the assumption that the cortex was necessary for such pain.[27] In fact, Dr. Derbyshire was one of only two neuroscientists on the panel that produced the 2010 Royal College of Obstetricians and Gynaecologists (RCOG) report[28] rejecting the possibility of fetal pain before 22 weeks—not as a tested conclusion but merely as an inference flowing from the unproven "belie[f] that the cortex is necessary for pain perception."[29]

Yet Derbyshire abandoned his position on the cortex's necessity two years ago, noting that thalamic projections into the cortical subplate could be sufficient for pain perception and that such projections begin to emerge at 12 weeks post-fertilization. He now concludes: "the evidence, and a balanced reading of that evidence, points toward an immediate and unreflective pain experience mediated by the developing function of the

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[25] *See* Derbyshire, S. W. G., & Bockmann, J. (2020). Fetal pain and abortion. *Journal of Medical Ethics Blog*. https://blogs.bmj.com/medical-ethics/2020/01/15/fetal-pain-and-abortion/.

[26] Belluck, P. (2013, Sept. 16). Complex science at issue in politics of fetal pain. *N.Y. Times*. https://www.nytimes.com/2013/09/17/health/complex-science-at-issue-in-politics-of-fetal-pain.html.

[27] *See, e.g.*, Derbyshire, S. W. G. (2006). Can fetuses feel pain? *BMJ*, *332*(7546), 909-912, 909.

[28] Royal College of Obstetricians & Gynaecologists. (2010). Fetal awareness: Review of research and recommendations for practice, at ix.

[29] *Id.* at viii; *cf.* Lee, S. J., *et al.* (2005). Fetal pain: A systematic multidisciplinary review of the evidence. *JAMA*, *294*(8), 947-954, 949. (asserting, without citation to any evidence or authority, that "the psychological nature of pain presupposes the presence of functional thalamocortical circuitry required for conscious perception").

nervous system from as early as 12 weeks."[30] As another, more comprehensive expert review of fetal pain published in 2022 concluded: "*Denial of fetal pain capacity beginning in the first trimester, potentially as early as 8–12 weeks gestation, is no longer tenable.*"[31]

Indeed, a fair view of the current evidence readily shows that claims denying fetal pain without the cortex rest on mere *ipse dixit*,[32] while an enormous body of data—representing multiple, independent lines of scientific evidence—all point to the pre-viability fetus's developmental capacity for, and actual experience of, conscious suffering.

First, five separate lines of evidence show that both animals and humans exhibit consciousness and suffering even when the cortex is impaired, immature, or absent, and that deletions of *sub*cortical circuitry are sufficient to cause disorders of consciousness:

- While the neocortex is unique to mammals, animals that entirely lack that region of the brain (fish, amphibians, reptiles, and birds) are both conscious and capable of suffering.[33]
- Mammals (including rodents, cats, and primates) that have had the cortex partially or fully removed remain conscious and continue to show a vigorous response to

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[30] Derbyshire, S. W. G., & Bockmann, J. (2020). Reconsidering fetal pain. *Journal of Medical Ethics*, *46*, 3-6, 6. (added emphasis); *see also id.* at 4 ("current neuroscientific evidence undermines the necessity of the cortex for pain experience"); *id.* ("it is now clear that the [position rejecting fetal pain before 22 weeks post-fertilization] is no longer tenable").

[31] Thill, B. (2022). Fetal pain in the first trimester. *The Linacre Quarterly*, *89*(1), 73-100.

[32] *See, e.g.*, Lee, *supra* note 29, at 949 (asserting, without citation to any evidence or authority, that "pain perception requires cortical recognition of the stimulus as unpleasant").

[33] Extensive studies have determined that the neural structures underlying the most primitive form of consciousness in both humans and animals are found in subcortical regions of the brain. See, *e.g.*, Panksepp, J. (2011). Cross-species affective neuroscience decoding of the primal affective experiences of humans and related animals. *PLoS ONE*, *6*(9), at 1-15.

painful stimuli.[34]

- Similarly, human children born without the cortex ("decorticate" or hydraencephalic patients) are conscious, indicating that long-range cortical connections developing only after 22 weeks in the human fetus, and completely absent in these patients, are not necessary for consciousness or for a psychological perception of suffering.[35]
- Multiple studies indicate that, while human processing of pain and the associations it elicits may become more complex over time, perception of pain remains relatively constant from childhood into adulthood,[36] demonstrating that late-developing cortical circuitry is unnecessary for a conscious experience of suffering.[37]
- In 2015, the largest study to date of human patients with consciousness disorders unambiguously concluded that the loss of consciousness is associated not with the loss of cortical, but rather of subcortical circuitry.[38] And experts in the study of

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[34] *See, e.g.*, Matthies, B. K., & Franklin, K. B. J. (1992). Formalin pain is expressed in decerebrate rats but not attenuated by morphine. *Pain, 51*(2), 199-206.

[35] Among other things, these studies of show that decorticate or hydraencephalic patients are capable of conscious behaviors, including smiling, distinguishing between familiar/unfamiliar people and situations, having preferences for particular kinds of music and having adverse reactions to pain. *See, e.g.*, Beshkar, M. (2008). The presence of consciousness in the absence of the cerebral cortex. *Synapse*, *62*(7), 553-556.

[36] *See, e.g.*, Harrop, J. E. (2007). Management of pain in childhood. *Archives of Disease in Childhood*, *92*(4), ep101-108.

[37] That consistency in pain perception undercuts the necessity of the cortex because the cortical regions associated with painful experiences (dorsal-lateral prefrontal cortex and dorsal-anterior cingulate cortex) are among the last to achieve maturity and continue to develop for decades after birth. *See, e.g.*, Gogtay, N., *et al.* (2004). Dynamic mapping of human cortical development during childhood through early adulthood. *Proceedings of the National Academy of Sciences of the U.S.*, *101*(21), 8174-8179.

[38] Lutkenhoff, E. S., *et al.* (2015). Thalamic and extrathalamic mechanisms of consciousness after severe brain injury. *Annals of Neurology*, *78*(1), 68-76, 68. ("[C]linical measures of awareness and wakefulness *** were systematically associated with tissue atrophy within thalamic and basal ganglia nuclei.").

consciousness have elsewhere concluded that consciousness clearly persists even without "vast regions of the cortex."[39]

Second, four separate lines of evidence show that consciousness and emotions do not arise in the cortex, but rather depend on subcortical circuitry, including the thalamus. These studies strongly establish that consciousness, although later contextualized in the cortex, originates in the thalamus:

- An authoritative review of the neural basis for human consciousness and emotion concludes that "the available evidence indicates that phylogenetically recent sectors of the nervous system, such as the cerebral cortex, contribute to but are not essential for the emergence of feelings, which are likely to arise instead from older regions such as the brainstem" and that the "neural substrates [of consciousness] can be found at all levels of the nervous system."[40]
- In the last decade, studies using high resolution brain imaging in both animals[41] and humans[42] have strongly indicated that anesthesia-induced loss of consciousness, and therefore conscious pain perception, is associated with a reduction in the activity of the thalamus, that is only later followed by suppression of cortical activity in response

[39] Morsella, E., *et al.* (2010). Minimal neuroanatomy for a conscious brain: Homing in on the networks constituting consciousness. *Neural Networks*, *23*(1), 14-15, 14.
[40] Damasio, A., & Carvalho, G. B. (2013). The nature of feelings: Evolutionary and neurobiological origins. *Nature Reviews Neuroscience*, *14*(2), 143-152, 143.
[41] Baker, R., *et al.* (2014). Altered activity in the central medial thalamus precedes changes in the neocortex during transitions into both sleep and propofol anesthesia. *The Journal of Neuroscience*, *34*(40), 13326-13335.
[42] Song, X., & Yu, B. (2015). Anesthetic effects of propofol in the healthy human brain: Functional imaging evidence. *Journal of Anesthesia*, *29*(2), 279-288; Gili, T., *et al.* (2013). The thalamus and brainstem act as key hubs in alterations of human brain network connectivity induced by mild propofol sedation. *The Journal of Neuroscience*, *33*(9), 4024-4031.

to reduced thalamic function.

- Rigorous brain stimulation studies demonstrate that pain can rarely if ever be elicited by activating cortical circuitry. This indicates that, while the cortex may build upon painful experiences generated by other brain regions, it is largely not involved in producing a conscious experience of pain; *i.e.*, in humans, the conscious experience of suffering depends almost entirely on subcortical brain regions that develop very early in the life of the fetus.[43]
- Finally, a large body of direct experimental and medical evidence contradicts the assertion that suffering requires cortical circuitry. Interventions such as ablation[44] or stimulation[45] of the cortex do not affect pain perception, while altering the function of subcortical structures[46] does, and is a highly effective treatment for patients with chronic pain.[47]

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[43] The most scientifically accurate way of determining the neural structures *sufficient* for a conscious experience of suffering (or any other conscious experience), is to directly stimulate a specific brain region in an alert patient and observe whether a pain response is elicited. In agreement with decades of prior research, a recent study of over 4000 stimulations of the cortex determined that pain responses were surprisingly rare (approximately 1.4%). Mazzola, L., *et al.* (2012). Stimulation of the human cortex and the experience of pain: Wilder Penfield's observations revisited. *Brain: A Journal of Neurology, 135*(Pt 2), 631-640, 631. Such findings strongly disassociate the cortex from the production of conscious suffering.

[44] *See, e.g.*, Matthies & Franklin, *supra* note 34.

[45] Fukaya, C., *et al.* (2003). Motor cortex stimulation in patients with post-stroke pain: Conscious somatosensory response and pain control. *Neurological Research, 25*(2), 153-156; Mazzola, *supra* note 43.

[46] *See, e.g.*, Nandi, D., *et al.* (2003). Thalamic field potentials in chronic central pain treated by periventricular gray stimulation – A series of eight cases. *Pain, 101*(1-2), 97-107.

[47] For example, so-called "Deep Brain Stimulation" of the thalamus, periaqueductal grey matter, and internal capsule—all early-developing, subcortical brain structures is a widely used pain therapy. *See, e.g.*, Falowski, S. M. (2015). Deep brain stimulation for chronic pain. *Current Pain & Headache Reports, 19*(7), 27.

Taken together, these nine lines of evidence—representing an extensive and diverse body of data generated almost entirely in the last two decades—indicate that consciousness and feeling, including conscious suffering, do not depend on cortical circuitry and are instead mediated by sub-cortical brain networks[48] that are established in a human fetus between 12 to 18 weeks.

Third, observations of fetal and newborn responses to stimuli, including 4D ultrasonographic studies of fetal behavior, provide direct, compelling evidence of the fetus's awareness of, and sensitivity to, painful stimuli:

- In considering use of anesthesia for invasive medical procedures performed on the fetus, a recent review of the evidence concluded that objections to the concept of fetal pain are "obsolete," and based on the totality of evidence "the human fetus can feel pain when it undergoes surgical interventions and direct analgesia must be provided to it."[49]
- Fetuses delivered as early as 21 weeks show clear pain-related behaviors.[50] But even more tellingly, the earlier the infants are delivered, the stronger their response to pain,[51] suggesting that later-developing cortical circuits, rather than enabling pain perception, moderate or even inhibit conscious suffering.[52]

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[48] *See also* Derbyshire & Bockmann, *supra* note 30, at 4 nn. 23, 26-32 (reviewing numerous recent studies undermining the necessity of the cortex for pain experience).
[49] Bellieni, C. V. (2021). Analgesia for fetal pain during prenatal surgery: 10 years of progress. *Pediatric Research*, *89*(7), 1612-1618.
[50] Gibbins, S., *et al.* (2008). Pain behaviours in extremely low gestational age infants. *Early Human Development*, *84*(7), 451-458.
[51] Badr, L. K., *et al.* (2010). Determinants of premature infant pain responses to heel sticks. *Pediatric Nursing*, *36*(3), 129-136.
[52] *See, e.g.*, Ossipov, M. H., *et al.* (2014). Descending pain modulation and chronification of pain. *Current Opinion in Supportive & Palliative Care*, *8*(2), 143-151.

- Finally, 4D ultrasound studies confirm the fetus, when subjected to painful stimuli, reacts with recognizable facial expressions consistently linked to a conscious experience of pain. A well-controlled study published in January 2021[53] demonstrated that fetuses undergoing injection of anesthetic into the thigh at approximately 29 weeks make facial gestures (grimacing, etc.)[54] specifically associated with a conscious pain experience from the injection, with such gestures not occurring either at rest or after a "startling" stimulus. Because of the small size of the fetus before the third trimester, in utero surgery at earlier ages was rare until fairly recently.[55] However, a June 2021 case study[56] has confirmed previous results and extended them into pre-viability, observing that a fetus undergoing heart surgery at 21 weeks post-fertilization also reacted with facial expressions showing a conscious experience of pain upon injection of anesthetic into the thigh.[57]

This final category of studies—those involving fetal facial expressions—are especially compelling on the question of fetal consciousness. Facial-action coding systems have been widely used to assess pain in adult humans, infants, and even in diverse animal

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[53] Bernardes, L. S., *et al.* (2021). Sorting pain out of salience: Assessment of pain facial expressions in the human fetus. *Pain Reports*, *6*(1), at 1-9.
[54] *Id.* at 5 (Figure 4, showing ultrasound images of pain expressions), 8 (links to ultrasound videos showing: (a) reaction to painful stimulus (http://links.lww.com/PR9/A91), (b) control group at rest (http://links.lww.com/PR9/A92), and (c) control group reacting to acoustic startle (http://links.lww.com/PR9/A93)).
[55] *See, e.g.*, Malloy, C., *et al.* (2019). The perinatal revolution. *Issues in Law & Medicine*, *34*(1), 15-41, 19-20.
[56] *See, e.g.*, Bernardes, L. S., *et al.* (2022). Acute pain facial expressions in 23-week fetus. *Ultrasound in Obstetrics & Gynecology*, *59*(3), 394-395.
[57] *Id.* (ultrasound video available at https://obgyn.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1002%2Fuog.23709&file=uog23709-sup-0001-VideoS1.mp4).

species (including mice, rats, rabbits, horses, and cats), based on strong evidence that, "facial expression can be used to quantify pain in individuals who are unable to express themselves verbally," such as "infants, young children, those with verbal or cognitive impairments."[58] In contrast, facial expression of pain does not consistently occur in unconscious individuals,[59] even though pain is routinely assessed in such patients by other physiologic and neurologic criteria.

The broad utility of assessing pain based on facial expressions for patients with diverse states of consciousness and/or language ability as well as for a wide range of animal species strongly indicates that facial gestures are not mere "reflexes" or responses to unconscious pain experiences (i.e., nociception) but rather are an evolutionarily conserved mode of communicating the emotional and psychological experience of *conscious* pain (i.e., a "universal language" for expression of suffering).

In short, all twelve lines of evidence presented here support the conclusions that (a) contrary to the critical assumption made by RCOG and other physician trade associations, a connection between the thalamus and the cortex is not necessary for a fetus to be conscious and experience suffering; and (b) a fetus is likely conscious and capable of apprehending pain at or before 18 weeks—and perhaps as early as 12 weeks.

This large and growing body of evidence puts to rest any empirical question of whether the fetus is alive before viability: Any active, growing organism is clearly "alive"

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[58] Chambers, C. T. & Mogil, J. S. (2015). Ontogeny and phylogeny of facial expression of pain: *Pain*, *156*(5), 798-799, 798.
[59] Gélinas, C., *et al.* (2019). Behaviors indicative of pain in brain-injured adult patients with different levels of consciousness in the intensive care unit. *Journal of Pain & Symptom Management*, *57*(4), 761-773.

as that term is overwhelmingly understood.[60] And, as an organism of human origin, showing multiple signs of consciousness and emotion, a fetus is not merely "alive" but also capable at an early age of planning, discriminating, learning and emotional feeling.

CONCLUSION

For these reasons, regardless of whether this Court were to recognize a constitutional right to abortion, it should give full and decisive weight to Kentucky's compelling interest in protecting early human life. The growing evidence of fetal consciousness and capacity for suffering strongly implicates any humane government's powerful interest in preventing cruelty to conscious humans and other living beings—a value so widely recognized as to be ubiquitous. As even former skeptics now acknowledge, continued refusal to consider fetal pain in the face of mounting proof smacks of "moral recklessness."[61] Because these myriad advancements implicate the highest legal and ethical stakes, any judicial foray into these complex issues must afford due deference to the legislature as the appropriate arbiter of any lingering scientific uncertainty. This Court should therefore dissolve the circuit court's injunction and allow the Commonwealth to enforce its duly enacted abortion regulations.

Respectfully submitted,

Counsel for Amici Curiae

[60] *See, e.g.,* Rosslenbroich, B. (2016). Properties of life: Toward a coherent understanding of the organism. *Acta Biotheoretica, 64*(3), 277-307.
[61] Derbyshire & Bockmann, *supra* note 30, at 5.