PEDIATRICS PERSPECTIVES

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ABBREVIATION

EGA—estimated gestational age

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Limits of Human Viability in the United States: A Medicolegal Review

Throughout American history, medical and legal definitions of human viability have evolved on interrelated but slightly different trajectories. In the early 19th century, although common law did not consider abortion to be a criminal offense, it was discouraged after the onset of quickening, which connected the initial delineation of viability to the sensation of fetal movement within the womb. When post–Civil War physicians campaigned to outlaw abortion, it was transformed into a criminal act, because societal attitudes had redefined human life as beginning at conception.[1]

In 1935, the American Academy of Pediatrics defined a premature infant as one who weighed <2500 g at birth regardless of gestational age,[2] a standard first adopted in Europe in 1919.[3] Although no minimum weight for viability was established, 1250 g was frequently used and corresponded to an estimated gestational age (EGA) of 28 weeks.[2,4] In the mid-20th century, the addition of gestational age and crown-to-heel length to assist with the definition of viability was advocated.[5,6]

In the 1950s, infantile respiratory distress syndrome was described to the Royal College of Obstetricians and Gynaecologists of the United Kingdom[7] and identified as a principal cause of death in infants younger than 37 weeks' EGA. This led to a landmark distinction between "premature" and "growth-restricted" infants who weighed <2500 g at birth.[8] In the ensuing decades, neonatal mechanical ventilation and parenteral nutrition became established as contemporary cornerstones of neonatal medicine. Although the mortality rate of infants born at <1800 g was not significantly altered by initial intermittent positive-pressure ventilator strategies,[9] the subsequent advent of continuous positive airway pressure in the 1970s markedly improved these outcomes.[10,11] As neonatal total parenteral nutritional therapy became increasingly mainstream,[12] the medical definition of viability continued to evolve as well.

During this time, the landmark US Supreme Court case of *Roe v Wade* legalized abortion in the United States. This legislation developed a trimester framework for gestational age, establishing that abortions in the third trimester could be performed only if the health of the mother was in jeopardy, which implied that a fetus was legally viable at 28 weeks.[13] Subsequent cases during this decade failed to establish alternative legal definitions of viability. In 1976, *Planned Parenthood of Central Missouri v Danforth* determined that viability was achieved at different times for each pregnancy and, therefore, was a matter of judgment of the attending physician.[14] Three years later, *Colautti v Franklin* rejected a Pennsylvania statute that would have

TABLE 1 Individual State and Territory Statutes Pertaining to Viability and/or Abortion Restrictions

US State or Territory	Viability Definition, Viability Testing, and Feticide and/or Abortion Regulation Statutes[a]
Alabama: Ala. §26-22-2 (2010); Ala. §26-22-4 (2010)	Except in the case of a medical emergency, prior to performing an abortion upon a woman subsequent to her first 19 weeks of pregnancy, the physician shall determine whether, in his or her good faith medical judgment, the child is viable. Viability is defined as the stage of fetal development when, in the judgment of the physician . . . there is a reasonable likelihood of sustained survival of the unborn child outside the body of his or her mother, with or without artificial support
Alaska: AS 18.16.060 (2009)	Defines "partial-birth" abortions, but does not outline any other procedure restrictions or define viability
Arizona: A.R.S 36-2301.01 (2010)	"Viable fetus" means the unborn offspring of human beings that has reached a stage of fetal development so that, in the judgment of the attending physician on the particular facts of the case, there is a reasonable probability of the fetus' sustained survival outside the uterus, with or without artificial support
Arkansas: A.C.A. §20-18-603 (2010)	Except in the case of a medical emergency, before an abortion is performed on an unborn child whose gestational age is 20 weeks or more, the physician performing the abortion or the physician's agent shall inform the pregnant female whether an anesthetic or analgesic would eliminate or alleviate organic pain to the unborn child that could be caused by the particular method of abortion to be employed. Each fetal death when the fetus weighs 350 g or more, or if weight is unknown, the fetus completed 20 weeks gestation or more, that occurs in this State shall be reported within five days after delivery
California: Health and Safety Code 123464 (2010); Health and Safety Code 123466 (2010)	"Viability" means the point in a pregnancy when, in the good faith medical judgment of a physician, on the particular facts of the case before that physician, there is a reasonable likelihood of the fetus' sustained survival outside the uterus without the application of extraordinary medical measures. The state may not deny or interfere with a woman's right to choose or obtain an abortion prior to viability of the fetus, or when the abortion is necessary to protect the life or health of the woman
Colorado: C.R.S. 1963: §40-6-101(2010); C.R.S. 1963: §40-6-102 (2010)	"Justified medical termination" means the intentional ending of the pregnancy of a woman at the request of said woman by a licensed physician using accepted medical procedures in a licensed hospital upon written certification by all of the members of a special hospital board that continuation of the pregnancy, in their opinion, is likely to result in the death or the serious permanent impairment of the physical or mental health of the woman; or less than 16 weeks of gestation have passed and that the pregnancy resulted from sexual assault or incest. Any person who intentionally ends or causes to be ended the pregnancy of a woman by any means other than justified medical termination or birth commits criminal abortion
Connecticut: Regs., Conn. State Agencies §19-13-D54 (2010)	During the third trimester of pregnancy, abortions may be performed only when necessary to preserve the life or health of the expectant mother. If the newborn shows signs of life following an abortion, those measures used to support life in a premature infant shall be employed
Delaware: 24 Del. C. 1953, §1790	In no event shall any physician terminate or attempt to terminate or assist in the termination or attempt at termination of a human pregnancy otherwise than by birth unless: not more than 20 weeks of gestation have passed, continuation of the pregnancy is likely to result in the death of the mother, or the fetus is dead
Florida: Fla. Stat. §390.0111 (2010)	Viability means that state of fetal development when the life of the unborn child may with a reasonable degree of medical probability be continued indefinitely outside the womb. No termination of pregnancy shall be performed on any human being in the third trimester unless two physicians certify in writing to the fact that, to a reasonable degree of medical probability, the termination of pregnancy is necessary to save the life or preserve the health of the pregnant woman
Georgia: Ga. Comp. R & Regs. R. 290-5-32-.02 (2010)	No abortion is authorized nor shall be performed after the second trimester unless the attending physician and two consulting physicians certify in writing and make such statement a part of the medical records of the patient that said abortion is necessary in their best clinical judgment to preserve the life or health of the woman
Guam: 9 GCA §31.20 (2009)	An abortion may be performed within 13 weeks after the commencement of the pregnancy; or within 26 weeks . . . if the physician has reasonably determined using all available means that the child would be born with a grave physical or mental defect; or that the pregnancy resulted from rape or incest; or at any time after the commencement of pregnancy if . . . there is a substantial risk . . . of the mother
Hawaii: HRS §453-16 (2010)	The State shall not deny or interfere with a female's right to choose or obtain an abortion of a nonviable fetus or an abortion that is necessary to protect the life or health of the female. Fetus in last trimester was vested with all rights of human beings
Idaho: Idaho Code §18-604 (2010)	"Third trimester of pregnancy" means that portion of a pregnancy from and after the point in time when the fetus becomes viable. Any reference to a viable fetus shall be construed to mean a fetus potentially able to live outside the mother's womb, albeit with artificial aide
Illinois: 720 ILCS 510/2 (2010)	"Viability" means that stage of fetal development when, in the medical judgment of the attending physician based on the particular facts of the case before him, there is a reasonable likelihood of sustained survival of the fetus outside the womb, with or without artificial aide
Indiana: Burns Ind. Code Ann. §16-34-2-3 (2010)	An abortion may be performed after a fetus is viable only if there is in attendance a physician, other than the physician performing the abortion, who shall take control of and provide immediate care for a child born alive as a result of the abortion. Any fetus born alive shall be treated as a person under the law, and a birth certificate shall be issued certifying that child's birth even though the child may subsequently die
Iowa: Iowa Code §707.7 (2010)	Any person who intentionally terminates a human pregnancy, after the end of the second trimester of the pregnancy where death of the fetus results commits feticide, a class C felony. This shall not apply to the termination of a human pregnancy performed by a physician licensed in this state to practice when in the best clinical judgment the termination is performed to preserve the life or health of the pregnant person or of the fetus
Kansas: K.S.A. §65-6701 (2009)	"Viable" means that stage of gestation when, in the best medical judgment of the attending physician, the fetus is capable of sustained survival outside the uterus without the application of extraordinary medical means. If the physician determines the gestational age of the fetus is 22 or more weeks, prior to performing an abortion upon the woman the physician shall determine if the fetus is viable by using and exercising that degree of care, skill and proficiency commonly exercised

TABLE 1 Continued

US State or Territory	Viability Definition, Viability Testing, and Feticide and/or Abortion Regulation Statutes[a]
Kentucky: KRS §311.780 (2010)	"Viability" shall mean that stage of human development when the life of the unborn child may be continued by natural or life-supportive systems outside the womb of the mother. No abortion shall be performed or prescribed knowingly after the unborn child may reasonably be expected to have reached viability, except when necessary to preserve the life or health of the woman. In those instances, the person performing the abortion shall take all reasonable steps in keeping with reasonable medical practices to preserve the life and health of the child
Louisiana: La. R.S. 14:87.5 (2010)	The intentional failure to sustain the life and health of an aborted viable infant shall be a crime. For the purposes of this Section, "viable" means that stage of fetal development when the life of the unborn child may be continued indefinitely outside the womb by natural or artificial life-supporting systems
Maine: 22 M.R.S. §1598 (2010); 22 M.R.S. §1595 (2010)	"Viability" means the state of fetal development when the life of the fetus may be continued indefinitely outside the womb by natural or artificial life-supportive means. After viability an abortion may be performed only when it is necessary to preserve the life or health of the mother. "Live born" shall mean a product of conception after complete expulsion or extraction from its mother, irrespective of the duration of pregnancy, which breathes or shows any other evidence of life such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached
Maryland: Md. Health-General Code Ann. §20-209 (2010)	"Viable" means that stage when, in the best medical judgment of the attending physician based on the particular facts of the case before the physician, there is a reasonable likelihood of the fetus's sustained survival outside the womb. The State may not interfere with the decision of a woman to terminate a pregnancy before the fetus is viable or at any time if the termination procedure is necessary to protect the life or health of the woman
Massachusetts: ALM GL ch. 112, §12M (2010)	If a pregnancy has existed for 24 weeks or more, no abortion may be performed except by a physician and only if it is necessary to save the life of the mother, or if a continuation of her pregnancy will impose on her a substantial risk of grave impairment of her physical or mental health
Michigan: MCL 333.1073 (2009)	If an abortion performed in a hospital setting results in a live birth, the physician attending the abortion shall provide immediate medical care to the newborn, inform the mother of the live birth, and request transfer of the newborn to a resident, on-duty, or emergency room physician who shall provide medical care to the newborn. Physicians must report all abortions and the gestational age of each, from 5 to 28 weeks
Minnesota: Minn. Stat. §145.411 (2009)	"Viable" means able to live outside the womb even though artificial aid may be required. During the second half of its gestation period a fetus shall be considered potentially "viable"
Mississippi: Miss. Code Ann. §41-41-31 (2010)	No abortion shall be performed or induced in the State of Mississippi, except in the case where necessary for the preservation of the mother's life or where the pregnancy was caused by rape
Missouri: S 188.015 R.S.Mo. (2010)	"Viability", that stage of fetal development when the life of the unborn child may be continued indefinitely outside the womb by natural or artificial life-supportive systems. No abortion of a viable unborn child shall be performed unless necessary to preserve the life or health of the woman. An abortion of a viable unborn child shall be performed or induced only when there is in attendance a physician other than the physician performing or inducing the abortion who shall take control of and provide immediate medical care for a child born as a result of the abortion
Montana: Mont. Code Anno., §50-20-102 (2010)	"Viability" means the ability of a fetus to live outside the mother's womb, albeit with artificial aid
Nebraska: R.R.S. Neb §28-325 (2010)	It is in the interest of the people of the State of Nebraska that every precaution be taken to insure the protection of every viable unborn child being aborted, and every precaution be taken to provide life-supportive procedures to insure the unborn child its continued life after its abortion
Nevada: Nev. Rev. Stat. Ann. §201.120 (2010)	No abortion may be performed in this state unless the abortion is performed within 24 weeks after the commencement of the pregnancy. After the 24th week of pregnancy only if the physician has reasonable cause to believe that an abortion currently is necessary to preserve the life of health of the pregnant woman
New Hampshire: RSA 5 C:1 (2010)	"Fetal death" means the expulsion or extraction of a product of human conception having completed at least 20 weeks gestation or weighing at least 350 g and resulting in other than a live birth that is not a purposeful interruption of an intrauterine pregnancy
New Jersey: N.J.A.C. 13: 35-4.2 (2010)	The termination of a pregnancy at any stage of gestation is a procedure which may be performed only by a physician licensed to practice medicine and surgery in the State of New Jersey. A physician may request from the Board permission to perform a dilatation and evacuation procedure in a licensed hospital or licensed ambulatory care facility after 20 weeks from start of last menstrual period
New Mexico: 30-5-1 NMSA 1978 (2011)	Only sanctions "medically necessary" abortions, defined as those to terminate pregnancies that resulted from rape or incest or those that threaten the life or health of the pregnant woman
New York: NY CLS Pub Health §4164 (2010)	When an abortion is to be performed after the 20th week of pregnancy, a physician other than the physician performing the abortion shall be in attendance to take control of and to provide immediate medical care for any live birth that is the result of an abortion
North Carolina: N.C. Gen. Stat. §14-45.1 (2010)	It shall not be unlawful, after the 20th week of a woman's pregnancy, to advise, procure or cause a miscarriage or abortion when the procedure is performed by a physician licensed to practice medicine in North Carolina if there is a substantial risk that continuance of the pregnancy would threaten the life or gravely impair the health of the woman
North Dakota: N.D. Cent. Code §14-02.1-02 (2010); N.D. Cent. Code §14-02.1-05 (2010)	"Viable" means the ability of a fetus to live outside the mother's womb, albeit with artificial aid. An abortion of a viable child may be performed only when there is in attendance a physician other than the physician performing the abortion who shall take control and provide immediate medical care to the viable child born as a result of the abortion

TABLE 1 Continued

US State or Territory	Viability Definition, Viability Testing, and Feticide and/or Abortion Regulation Statutes[a]
Ohio: ORC Ann. 2919.16 (2010)	No physician shall perform or induce or attempt to perform or induce an abortion upon a pregnant woman after the beginning of her 22nd week of pregnancy unless, prior to the attempt, the physician determines in good faith and in the exercise of reasonable medical judgment that the unborn human is not viable
Oklahoma: 63 Okl. St. §1-730 (2010)	"Viable" means potentially able to live outside the womb of the mother upon premature birth, whether resulting from natural causes or an abortion. No person shall induce an abortion after such time that the unborn child has become viable unless such abortion is necessary to prevent the death of the pregnant woman or to prevent impairment of her health. An unborn child shall be presumed to be viable if more than 24 weeks have elapsed since the beginning of the last menstrual period of the pregnant woman
Oregon: ORS 432.005 (2009)	"Induced termination of pregnancy" means the purposeful interruption of an intrauterine pregnancy with the intention other than to produce a live-born infant and that does not result in a live birth. No limitations are outlined and no viability definition exists
Pennsylvania: 18 Pa.C.S. §3203 (2010); 18 Pa.C.S. §3211 (2010)	"Viability" is that stage of fetal development when in the judgment of the physician based on the particular facts of the case before him and in light of the most advanced medical technology and information available to him, there is a reasonable likelihood of sustained survival of the unborn child outside the body of his or her mother, with or without artificial support. Except as provided in subsection (b), no person shall perform or induce an abortion when the gestational age of the unborn child is 24 or more weeks
Rhode Island: CRIR 14-000-009 (2010)	[Termination of pregnancy] shall be performed in the final trimester only when necessary to preserve the life or health of the mother
South Carolina: S.C. Code Ann. §44-41-10 (2009)	"Viability" means that stage of human development when the fetus is potentially able to live outside of the mother's womb with or without the aid of artificial life support systems. For the purposes of this chapter, a legal presumption is hereby created that viability occurs no sooner than the 24th week of pregnancy
South Dakota: S.D. Codified Laws §34-23A-4 (2010)	An abortion may be performed following the 24th week of pregnancy by a physician only if there is appropriate and reasonable medical judgment that performance of an abortion is necessary to preserve the life or health of the mother
Tennessee: Tenn. Code. Ann. §39-15-202 (2010)	An abortion shall be performed upon a pregnant woman only after she has been orally informed by her attending physician of the following facts and has signed a consent form acknowledging that she has been informed as follows: That if more than 24 weeks have elapsed from the time of conception, her child may be viable, that is, capable of surviving outside the womb, and that if the child is prematurely born alive in the course of an abortion her attending physician has a legal obligation to take steps to preserve the life and health of the child
Texas: Tex. Health & Safety Code §170.001 (2010)	"Viable" means the stage of fetal development when, in the medical judgment of the attending physician based on the particular facts of the case, an unborn child possesses the capacity to live outside its mother's womb after its premature birth from any cause. The term does not include a fetus whose biparietal diameter is less than 60 millimeters
Utah: Utah Code Ann. §76-7-310.5 (2010)	Determination of viability shall be made by the physician, based upon his own best clinical judgment
US Virgin Islands: 14 V.I.C. S 151 (2010)	An abortion may be performed in this territory after 24 weeks of pregnancy only if the surgeon or gynecologist has reasonable cause to believe that there is substantial risk that the continuation of pregnancy will endanger the life or health of the pregnant female
Vermont: 18 V.S.A. §522 (2010)	All fetal deaths of 20 or more weeks of gestation or if gestational age is unknown, of 400 or more grams, 15 or more ounces fetal weight shall be reported by the hospital, physician, or funeral director directly to the commissioner within seven days after delivery
Virginia: Va. Code Ann. §18.2-74	It shall be lawful to perform an abortion or cause a miscarriage on any woman in a stage of pregnancy subsequent to the second trimester provided that the physician and two consulting physicians certify and so enter in the hospital record of the woman that in their medical opinion, based upon their best clinical judgment, the continuation of the pregnancy is likely to result in the death of the woman or substantially and irremediably impair the mental or physical health of the woman and that measures for life support for the product of such abortion or miscarriage must be available and utilized if there is any clearly visible evidence of viability
Washington: Rev. Code Wash (ARCW) §9.02.170 (2010)	"Viability" means the point in the pregnancy when in the judgment of the physician on the particular facts of the case before such physician, there is a reasonable likelihood of the fetus's sustained survival outside the uterus without the application of extraordinary medical measures
West Virginia: WVC §16-2I-2 (2010)	No abortion may be performed in this state except with the voluntary and informed consent of the female upon whom the abortion is to be performed. No procedure limitations based on gestational age or definition of viability are outlined
Wisconsin: Wis. Stat. §940.15 (2010)	"Viability" means that stage of fetal development when, in the medical judgment of the attending physician based on the particular facts of the case before him or her, there is a reasonable likelihood of sustained survival of the fetus outside the womb, with or without artificial aid
Wyoming: Wyo. Stat. §35-6-101 (2010); Wyo. Stat. §35-6-102 (2010); Wyo. Stat. §35-6-104 (2010)	"Viability" means that stage of human development when the embryo or fetus is able to live by natural or life-supportive systems outside the womb of the mother according to appropriate medical judgment. An abortion shall not be performed after the embryo or fetus has reached viability except when necessary to preserve the woman from an imminent peril that substantially endangers her life or health. The commonly accepted means of care shall be employed in the treatment of any viable infant aborted alive with any chance of survival

[a] Not all states outline specific viability definitions; however, some related statutes presume a definition of fetal viability in their wording.

required physicians to protect the life of a potentially viable fetus either during or after an abortive procedure, ruling instead that the determination of viability was to be performed on a case-by-case basis.[15]

In 1978, the first infants who weighed <750 g were successfully ventilated[16]; by the 1980s, survival of infants who were born weighing 500 to 700 g or were of 24 to 26 weeks' gestation became an expected possibility in regional NICUs, which anecdotally established these characteristics as contemporary limits of viability.[16,17] With extremely low birth weight infants at the limits of viability surviving beyond the postnatal period, the study of long-term outcomes, particularly neurodevelopmental impairment and growth failure, became increasingly important.[16–19] The 1980s and 1990s brought new waves of neonatal biomedical advances, led by tracheal instillation of surfactant for respiratory distress syndrome[20–22] and the use of antenatal corticosteroids in women with imminent delivery of a preterm infant at 24 to 34 weeks' gestation.[23] With these changes, survival of infants born at 23 and 24 weeks' EGA became increasingly frequent.[24–26]

Although the medical limit of viability began to enter into the second trimester, the legal definition of this limit continued to defy strict delineation. In 1989, *Webster v Reproductive Health Services* declined to uphold a provision that required physicians to test for fetal viability before performing an abortion of fetuses aged 20 weeks' EGA or older.[27] Three years later, in the seminal case of *Planned Parenthood of Southeastern Pa. v Casey*, the Courts abandoned Roe's landmark trimester framework and adopted previability and postviability statutes. In this decision, the Court stated, "Whenever viability may occur, be it at 23–24 weeks, the standard at the time, or earlier, as may be the standard sometime in the future, the attainment of viability serves as the critical fact in abortion legislature.[28]"

The legal limit of viability continued to be restructured with the Born Alive Infants Protection Act (BAIPA) of 2002. This act aimed to protect infants born with signs of life regardless of gestational age or whether the birth was a product of an abortive procedure. Subsequently, the US Department of Health and Human Services announced that it would uphold the BAIPA and use it to investigate alleged violations of the Emergency Medical Treatment and Labor Act (EMTALA), including claims of an infant "suffering from an emergency medical condition" not being medically evaluated.[29,30] In 2004, *Preston v Meriter Hospital Inc* used this policy in litigation against hospital staff who chose not to attempt resuscitation of a 700-g 23-week-gestation newborn, claiming that the infant was not provided appropriate medical screening in violation of the EMTALA. The hospital's counsel argued that because the infant was born in the labor and delivery unit, the EMTALA did not apply. On this count, the appeals court ruled in favor of the plaintiff, stating that the infant deserved screening by a physician regardless of the actual department in which he was born, which made the EMTALA a mandate capable of enforcing a medical determination of viability for infants born at the margins of viability, regardless of the actual birth weight, gestational age, or location within a hospital.[31]

At present, specific regulations on abortion limits or legal definitions of viability have been delegated to the individual states and territories of the United States (Table 1); the majority of these statues have deferred judgment of viability to the attending physician.[32] Of those that state or infer a gestational limit of viability, the limit ranges from 19 to 28 weeks.[33–47] Alabama has the strictest limitations, dictating that after 19 weeks' gestation, a physician must determine in "good faith medical judgment" whether the child is viable before performing an abortion.[45] Texas has a notable caveat to its viability definition in that it excludes any fetus whose biparietal diameter is <60 mm.[46]

Under contemporary standards of care, the decision to resuscitate a 22- or 23-week infant is guided by antenatal bioethical deliberations and perinatal evaluations estimating the fetoneonatal probability of survival, including birth weight, EGA, and clinical appearance, as imperfect as these assessments may be.[48] A mandate for neonatal resuscitation to include a "trial of life" for infants born at the limit of viability may result in an increase in overall, but not necessarily medically or neurodevelopmentally intact, survival of extremely premature infants.[49] Recently, among resuscitated infants who weighed >400 g at birth, ~6% of 22 weeks' EGA infants and 26% of 23 weeks' EGA infants were reported to survive to NICU discharge, which illustrates a contemporary definition of human viability.[50] As the medical and legal definitions of fetal viability continue to redefine themselves, their interrelationships will continue to be refined and debated as well.

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