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Affiliated with the National Right to Life Committee

**TESTIMONY OF MISSOURI RIGHT TO LIFE
BEFORE THE HOUSE
CHILDREN AND FAMILIES COMMITTEE
IN SUPPORT OF HB 1266**

January 30, 2018

TESTIMONY OF MISSOURI RIGHT TO LIFE
IN SUPPORT OF HB 1266

Missouri Right to Life strongly supports HB 1266, known as the Pain Capable Unborn Child Protection Act. Attached you will find multiple testimonies given by physicians from other states who have testified on similar language as HB 1266.

Some of the key points in this attached testimony pointing out the scientific facts of fetal pain capabilities of a baby at 20 weeks gestation:

Dr. Ferdinand F. Salvacion, MD – Medical Director, Pain Management Program, Memorial Medical Center; Associate Professor of Anesthesiology, Southern Illinois University School of Medicine:

“Development of neural elements required for processing perception of pain occurs relatively early in fetal development. The scientific literature has documented the presence of fully-functioning sensory receptors in the skin around the mouth of the fetus at 6 weeks gestational age. By 20 weeks, pain receptors have appeared throughout the body. Second order neurons in the spinal cord begin to develop from 10 to 30 weeks gestational age. The cerebral cortex starts to form at about 8-10 weeks gestational age. The number of cortical neurons increases by 10 times from 12 to 28 weeks gestational age. Connections between the thalamus and cortex begin to appear as early as 20 weeks gestational age. The structures required for pain perception are present in the fetus by 20 weeks gestational age.”

“Based on the scientific evidence, it is my opinion that the human fetus possesses the capacity to experience pain as early as 20 weeks gestational age, and the pain perceived is possibly more intense than that perceived by mature newborns. It is also my opinion that the fetus would be subjected to intense, excruciating pain, occurring prior to fetal demise, from abortion procedures used in the second and third trimesters.”

Dr. Tom Grissom, MD – Medical Director, Advanced Pain Centers of Alaska; Clinical Instructor University of Washington School of Medicine Division of Pain Medicine:

“Specialized nerve endings involved in pain transmission are seen as early as 7 weeks and are found throughout all organs by 20 weeks gestation. ...all the elements for the perception of pain are present by 20 weeks gestation.”

“The recognition of pain perception in the preterm infant and fetus has led to changes in anesthesia standards with improved surgical outcomes. There is no doubt that the fetus at 20 weeks gestation is capable of feeling pain as it relates to abortive procedures regardless of the technique employed.”

Dr. Paul Liu, Board Certified in Pediatrics, Pediatric Critical Care Medicine, and Anesthesiology; Clinical Assistant Professor of Pediatrics, University of Arizona College of Medicine, Tucson, AZ:

“A newborn can’t tell us, “I hurt, you poked me there.” What he does instead is he withdraws his limb, he cries, if you measure heart rate, that goes up; if you measure his blood pressure, that goes up. If you do extensive blood testing you’ll see that all these stress hormones go way up, because he feels pain. If you do that to a fetus in utero, and you’ve heard that said, that even on an ultrasound as they do intra uterine sampling of blood and things like that, and they actual get the needle and poke the little critter, he feels the same thing.”

“...the JAMA article from 2005, that says that basically neonates cannot feel pain up until about 29 weeks gestation.is very poorly written. And as one looks at this article, you’ll find that there is actually a conflict of interest. One of the significant authors is a director of an abortion clinic in San Francisco.”

Dr. William Polzin, M.D. – Director, Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Good Samaritan Hospital, Cincinnati, Ohio; Associate Director of the Fetal Care Center, Cincinnati, Ohio; Medical Director of Healthy Beginnings, Inc.

Regarding Dr. Polzin’s testimony on a Kansas bill similar to HB 1266: “...is an accurately worded bill that lays a basis to a reasonable description of why pain is, in fact, recognized by the fetus despite its inability to articulate the degree of pain. The pain can be registered through physiologic measurements such as heart rate and reactive movements.”

Dr. Colleen A. Malloy, MD – Assistant Professor, Division of Neonatology/Department of Pediatrics, Northwestern University Feinberg School of Medicine Before the Subcommittee on the Constitution, Committee on the Judiciary, U.S. House of Representatives:

“In the Neonatal Intensive Care Unit, we can witness first-hand the change in vital signs associated with pain. When procedures such as IV placement or chest tube insertion are performed on neonates at 20 weeks post-fertilization age and above, the response is similar to those seen in older infants or children. With the advent of ultrasound including real-time ultrasound, we know that even at 8 weeks post fertilization, the fetus makes movements in response to stimuli. At 20 weeks post-fertilization, the fetus responds to sound, as mothers will commonly report increased fetal movement in response to music, sirens, or alarms.”

Scientific facts show us that babies feel pain during an abortion at 20 weeks gestation. Missouri Right to Life urges this committee to pass HB 1266 and stop abortions at 20 weeks gestation.

Statement of Ferdinand F. Salvacion, MD

Medical Director, Pain Management Program
Memorial Medical Center

Associate Professor of Anesthesiology
Southern Illinois University School of Medicine

before the

Nebraska Legislature Judiciary Committee

Introduction

Chairperson Ashford, and members of the Judiciary committee. My name is Ferdinand Salvacion, MD. I am the medical director of the Pain Management Program at Memorial Medical Center in Springfield, IL. I have an appointment to clinical faculty as Associate Professor of Anesthesiology at Southern Illinois School of Medicine. I am board certified in Anesthesiology and Pain Medicine. I have been practicing exclusively in the specialty of pain medicine since 1996.

I appreciate the invitation to testify before the Nebraska Legislature Judiciary Committee on the topic of fetal pain. I understand the committee is considering Nebraska Legislative Bill 1103 - the Abortion Pain Prevention Act. I will focus my testimony on our understanding of pain, the anatomy and physiology required for pain perception, and the capacity of a fetus to experience pain.

What is pain?

The International Association for the Study of Pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Note: The inability to communicate verbally does not negate the possibility that an individual is experiencing pain¹.” Pain can be expressed non verbally by movement in responses to a stimulus or physiological changes, such as changes in heart rate or blood pressure. Despite discrete physiological changes that occur in response to pain, its measurement and expression is always subjective. Because of this subjectivity we cannot “know” what the feeling of pain is like for another person.

Anatomy and Physiology

The sequence of events by which a painful stimulus is perceived involves four processes: (1) transduction, (2) transmission, (3) modulation, and (4) perception. Transduction, or the initiation of a pain response, occurs in specialized sensory nerve cells (nociceptors) in the tissues of the skin, muscle, bones, and organs. These cells respond to different forms of energy, e.g. mechanical, heat, or cold and convert this information into electrical activity.

Transmission is the process by which this electrical activity is conducted through the nervous system. There are 3 major components of the transmission system. The first is the peripheral nerves which connect to second order spinal cord neurons. The spinal neurons are the second component in the transmission network. These cells send projections to various structures in the brainstem and diencephalon. The diencephalon is the region of the brain that includes the thalamus, hypothalamus, and other structures. Finally, neurons of the brainstem and diencephalon form the third component of the transmission network as they project to various cortex structures in the highest areas of the brain.

Modulation is the process whereby neural activity may be altered along the pain transmission pathway. There are pain pathways that descend from the brain and spinal cord whose purpose is to reduce the activity of the pain transmission pathway by the expression of inhibitory neurotransmitters and endogenous opioids.

Perception is the final stage of the process resulting in the subjective sensation of pain. It is what we define as "feeling pain". It presumably results from the concerted activation of the various cortical structures of the brain².

The Capacity of the Fetus to Experience Pain

Anatomical Development

Development of neural elements required for processing perception of pain occurs relatively early in fetal development. The scientific literature has documented the presence of fully-functioning sensory receptors in the skin around the mouth of the fetus at 6 weeks gestational age³. By 20 weeks, pain receptors have appeared throughout the body³. Second order neurons in the spinal cord begin to develop from 10 to 30 weeks gestational age^{3,4}. The cerebral cortex starts to form at about 8-10 weeks gestational age³. The number of cortical neurons increases by 10 times from 12 to 28 weeks gestational age⁵. Connections between the thalamus and cortex begin to appear as early as 20 weeks gestational age^{3,6}. The structures required for pain perception are present in the fetus by 20 weeks gestational age.

The neurotransmitters in the spinal cord that mediate pain transmission appear early in development and are abundant. In contrast, the neurotransmitters used in modulation of pain transmission are not expressed until after birth. The ability to mitigate higher threshold pain input does not fully mature until after birth⁷. As a result, the pain pathways and the ability to perceive painful stimuli are developed before birth, while the ability to ameliorate pain through descending pathways and endogenous opioids is not.

Electroencephalography

This is a means by which brain activity is measured. It is the most objective way of assessing general cortical function because electroencephalograms (EEGs) identify and measure discrete electrical activity from cortical neurons. Such activity, as well as changes that occur in response to stimuli, can be measured and quantified objectively through EEG. EEG activity is seen from 19-20 weeks gestational age and sustained EEGs can be recorded from fetuses of 23 weeks gestational age⁸. Somatosensory evoked potentials (SEPs) may also provide evidence of pain processing in the somatosensory cortex. SEPs test the ability of a specific tract of nerves in the spinal cord to transmit pain sensation to the

somatosensory cortex via the thalamus, one of the structures in the diencephalon. SEPs can be recorded from the sensory cortex after 24 weeks of gestation⁹. SEPs and EEGs, which are medically defined instruments for the measure of neuronal activity, are evidence of pain processing and perception of pain in the fetus. Monitoring changes in EEG and SEP parameters are currently used extensively in the adult population, particularly in situations in which an adult cannot verbally express pain or changes in neurological status. The best example we see as clinicians is the use of SEPs in monitoring of spinal cord function in anesthetized patients in spine instrumentation cases, as well as EEG monitoring in intracranial procedures. In both instances, the patient, like a fetus, is rendered “non-verbal” with regard to pain responses and we must rely upon EEGs and SEPs to guide medical care.

Stress Responses

Pain and surgical stress are demonstrated by a coordinated outpouring of hormones from the pancreas, pituitary and adrenal glands. Cardiovascular responses such as increases in blood pressure and heart rate, abnormal heart rhythms, or poor cardiac output may signal pain. Fetuses have been observed to exhibit hormonal stress responses to painful stimuli as early as 16 weeks gestational age. Studies have demonstrated the significant increase in stress hormones following needle placement in the fetal abdomen for *in utero* blood transfusions. In contrast, no consistent hormonal response occurred in the fetuses transfused through the umbilical cord, a structure which does not contain pain receptors. The magnitude of the stress hormone response correlated with the duration of the painful stimulation. In addition, these responses were reduced when pain medication was administered directly to the fetus¹⁰, demonstrating pain processing and the ability to ameliorate pain pharmacologically is present in the fetus.

Behavior

Ultrasonographic findings report specific fetal movements in response to punctures *in utero*¹¹. Pre-term neonates born at 23 weeks gestational age show highly specific and well-coordinated physiologic and behavioral responses to pain, similar to those seen in full-term neonates, older infants, and small children¹².

The Premature Infant Pain Profile (PIPP) is a tool that was developed and validated as a measure for assessing pain in premature infants. The PIPP is a seven-item, four-point scale based on upper facial activity, physiological activity, and behavioral state¹³. The use of this and other pain assessment tools are utilized to measure and subsequently treat pain in vulnerable, non-verbal neonates in the ICU setting, who, by virtue of their necessary medical treatments are often subjected to painful procedures. Such repeated, painful treatments can lead to altered pain sensitivity and possibly emotional, behavioral, and learning disabilities later in life¹⁴.

Fetal Anesthesia

Fetal surgery is an area of rapid growth. Surgical intervention is considered for a fetus with a congenital condition that can compromise or disturb cardiovascular function or cause severe postnatal morbidity. Surgery is considered only if maternal risk is low and the risk of death or severe disability to the fetus outweighs no intervention. The medical community has recognized, given that fetal pain pathways are developed and functional in the fetus, that anesthesia for such surgeries is necessary not only for the

mother, but the infant as well. Hysterotomy based fetal surgery is best provided by general anesthesia with inhalational agents. General anesthetic agents can cross the placental barrier and fetal blood/brain barrier thus allowing an anesthetic delivered to the mother to reach the fetus as well. Equilibration between mother and fetus with inhalational agents is only 50-70% of maternal levels depending on the agent used, and this occurs only after an hour of anesthesia. Prior to fetal incision the fetus is routinely given additional doses of an opioid to supplement anesthesia and provide postoperative pain relief¹⁵.

Conclusion

A frame of reference does not currently exist for the prenatal condition. We must therefore rely on our understanding of the nervous system, as well as our interpretations of neurophysiologic data and behavioral responses to develop a contemporary interpretation that allow appreciation of fetal experience. Neurophysiologic findings taken together with the observed painful responses of premature infants appear to confirm pain occurs in the fetus. Opioid analgesics administered to the fetus are routinely used to supplement general anesthesia for fetal surgery to minimize procedural pain. Local anesthetics are used to prevent pain from minor procedures in pre-term neonates in the ICU setting.

Based on the scientific evidence, it is my opinion that the human fetus possesses the capacity to experience pain as early as 20 weeks gestational age, and the pain perceived is possibly more intense than that perceived by mature newborns. It is also my opinion that the fetus would be subjected to intense, excruciating pain, occurring prior to fetal demise, from abortion procedures used in the second and third trimesters.

References

1. International Association for the Study of Pain; IASP Pain Terminology. Available at <http://www.iasp-pain.org>. Accessed February 21, 2010
2. Raja S, Dougherty P. *Anatomy and Physiology of Somatosensory and Pain Processing* In: Benzon, H et al (ed). *Essentials of Pain Medicine and Regional Anesthesia*. 2nd ed (2005)
3. *Neurologic, Muscular, and Sensory Systems* In: Blackburn, S. *Maternal, Fetal, and Neonatal Physiology*. 3rd ed (2007)
4. Okado N, Kojima T. *Clinics in Developmental Medicine: Continuity of Neural Functions from Prenatal to Postnatal Life*. Vol 94 (1984)
5. Coskun V, Anand K. *Development of Supraspinal Pain Processing*. In: Anand, K et al (ed). *Pain in Neonates*. 2nd ed (2000)
6. Kostovic I, Rakic P. *J Comp Neurol*. Vol 219 (1983)
7. Leslie F, Loughlin S. *Development of Multiple Opioid Receptors*. In: Miller M (ed). *Development of the Central Nervous System, Effects of Alcohol and Opiates*. (1992)
8. Clancy R, Bergqvist A. *Current Practice of Clinical Electroencephalography*. 3rd ed (2003)
9. Klimach V, Cooke R. *Dev Med Child Neurol*. Vol 30 (1988)
10. Fisk N, et al. *Anesthesiology*. Vol 95 (2001)
11. Robinson S, Smotherman W. *J Neurobiol*. Vol 23 (1992)
12. Modi N, Glover V. *Fetal Pain and Stress* In: Anand, K et al (ed). *Pain in Neonates*. 2nd ed (2000)
13. Stevens, B et al. *Clin J of Pain*. Vol 12 (1996)
14. Anand K, et al. *Pediatrics*. Vol 117 (2006)
15. Galinkin J, et al. *Anesthesia for Fetal Surgery*. In: Motoyama E, Davis P (ed). *Smith's Anesthesia for Infants and Children*. 7th ed (2005)

Tom Grissom, MD

Medical Director, Advanced Pain Centers of Alaska

Clinical Instructor University of Washington School of Medicine
Division of Pain Medicine

Nebraska Legislature Judiciary Committee

Introduction

My name is Tom Grissom, MD. I am currently the Medical Director of Pain Medicine at Advanced Pain Centers of Alaska and a clinical instructor at the University of Washington Pain Medicine Fellowship Program. I have been practicing Pain Medicine since my fellowship in 1995. During this time I have been involved in providing anesthesia for a busy neonatal service with infants routinely born at 23-24 weeks gestation.

I appreciate the opportunity to testify before the Committee on the topic of fetal pain and I will try and focus my testimony on our current understanding of fetal and neonatal physiology and its relationship to pain.

Pain can be defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Both science and experience show us that the fetus and the preterm neonate are capable of feeling the unpleasant sensory experience of actual tissue damage.

Pain Transmission in the Neonate

The study of preterm infants has helped us understand pain in fetal development. These preterm infants have the same anatomy and physiology with regards to the nervous system and pain signal transmission. Since the fetus is incapable of verbal communication other markers for fetal responses to pain are utilized.

Specialized nerve endings involved in pain transmission are seen as early as 7 weeks and are found throughout all organs by 20 weeks gestation. These neurons are the first order neurons involved in pain signal transmission. These synapse or connect to second order neurons located in the dorsal horn of the spinal cord. These second order neurons develop before 13 weeks gestation and project up the spinal cord via ascending pathways to the thalamus and eventually to the cortex. The midbrain, brainstem and cortex are all present in the fetus by 20 weeks gestation. This means that all the elements for the perception of pain are present by 20 weeks gestation.

Our ability to study the perception of pain focuses on measuring the physiologic response to painful stimuli. The fetus shows increased levels of circulating hormones like cortisol and catecholamines in response to painful stimuli. These levels will actually increase in relationship to the level of stimulation. Studies of electrical activity including EEGs and SEPs show that the fetus responds to painful stimuli in the same way that infants do by 24 weeks gestation. In fact the responses are exaggerated because the inhibitory pathways involved in moderating pain signal transmission do not develop in the fetus until 34-36 weeks gestation.

Anesthesia and the Neonate

Up until the late 1980's preterm infants were not given anesthesia or analgesia with surgical procedures. In 1987 Anand and colleagues showed that preterm infants who were operated on without anesthesia or analgesia had hormonal responses consistent with pain seen in term infants and adults. This and other studies showed that these hormonal responses could be blunted or eliminated with the administration of anesthesia and analgesia agents. The administration of anesthesia to preterm infants with surgical procedures was also correlated with better outcomes. Today it is routine to provide anesthesia to not only preterm infants as early as 23 weeks but also to the fetus with in utero surgical procedures.

In Summary

Hormonal markers of fetal pain perception are seen as early as 7 weeks gestation. The anatomy of pain signal transmission and perception is present by 20 weeks gestation. Fetal responses to pain are present and can be measured using hormonal markers and cortical activity by 20 weeks gestation. The response in the fetus is actually greater than those seen in the term infant secondary to a lack of development of inhibitory pathways.

The recognition of pain perception in the preterm infant and fetus has led to changes in anesthesia standards with improved surgical outcomes. There is no doubt that the fetus at 20 weeks gestation is capable of feeling pain as it relates to abortive procedures regardless of the technique employed.

References

1. International Association for the Study of Pain; IASP Pain Terminology. Available at <http://www.iasp-pain.org> . Accessed February 21, 2010.
2. Raja S, Dougherty P. *Anatomy and Physiology of Somatosensory and Pain Processing* In: *Essentials of Pain Medicine and Regional Anesthesia*. 2nd ed (2010)
3. Blackburn S., *Neurologic, Muscular, and Sensory Systems* In: Blackburn, S. *Maternal, Fetal, and Neonatal Physiology*. 3rd ed (2007)
4. Okado N, Kojima T. *Clinics in Developmental Medicine: Continuity of Neural Functions from Prenatal to Postnatal Life*. Vol 94. (1984)
5. Coskun V, Anand K. *Development of supraspinal pain processing*. In: Anand, K et al (ed) *Pain in Neonates*. Vol 10. (2000)
6. Kostovic I, Rakic P. *J Comp Neurol*. Vol 219. (1983)
7. Leslie F, Loughlin S. *Development of multiple opioid receptors*. In: Miller M (ed) *Development of the Central Nervous System, Effects of Alcohol and Opiates*. (1992)
8. Clancy R, Bergqvist A. *Current Practice of Clinical Electroencephalography*. 3rd ed (2003)
9. Klimach V, Cooke R. *Dev Med Child Neurol*. Vol 30 (1988)
10. Fisk N, et al. *Anesthesiology*. Vol 95 (2001)
11. Robinson S, Smotherman W. *J Neurobiol*. Vol 23 (1992)
12. Anand K, McGrath P. *Pain in Neonates*. 2nd ed (2000)
13. Stevens, B et al. *Clin J of Pain*. Vol 12 (1996)
14. Anand K, et al. *Pediatrics*. Vol 117 (2006)
15. Galinkin J, et al. *Anesthesia for Fetal Surgery*. In *Smith's: Anesthesia for Infants and Children*. 7th edition (2004)

Testimony of Dr. Paul Liu, Board Certified in Pediatrics, Pediatric Critical Care Medicine, and Anesthesiology; Clinical Assistant Professor of Pediatrics, University of Arizona College of Medicine, Tucson, AZ.

Before Committee on State Affairs of Texas House of Representatives in public hearing on PreBorn Pain Bill: HB 2364 in 83rd Legislative Session, April 10th, 2013.

“I am an anesthesiologist, and I am also a pediatrician. I do critical care medicine for children. My name is Paul Liu. I am for the bill. I am here basically to substantiate the facts that fetuses do feel pain at 20 weeks. I think that the question was raised is whether or not what is developed in the fetus at 20 weeks... generally it is accepted that all pain receptors are present, especially around the mouth, throughout the body, et cetera. The train tracks are there from the skin receptors all the way to the spinal cord, from the spinal cord all the way to what we call the thalamus, which is a structure deep inside the brain. From the thalamus, there are normal fibers in the adult and in a term infant that permeate to what we call the end plate, and goes into the end plate into the cortex of the brain. And those fibers are not there at 20 weeks. They begin to develop around 23-24 weeks. And I think that this is the point at which the arguments begin as to whether or not the fetus can feel pain. Because as an adult, we have those fibers, and that is how we transduce pain. The absence of those fibers does not mean that a child cannot feel pain. That’s how we feel pain as an adult and as a term infant. There are neurotransmitters, what we basically call little hormones: norepinephrine, dopamine, serotonin, things like that that permeate, and also what we call substance, P, that’s for pain, that actually can permeate through that area and transduce signals of pain through that. How do we know that? Well, the proof is in the pudding, so to speak. You know, the question is whether or not children feel pain - or babies feel pain. They can’t tell us. A newborn can’t tell us, “I hurt, you poked me there.” What he does instead is he withdraws his limb, he cries, if you measure heart rate, that goes up; if you measure his blood pressure, that goes up. If you do extensive blood testing you’ll see that all these stress hormones go way up, because he feels pain. If you do that to a fetus in utero, and you’ve heard that said, that even on an ultrasound as they do intra uterine sampling of blood and things like that, and they actually get the needle and poke the little critter, he feels the same thing. He moves away. You can actually see some of these infants cry. You’ll see them withdraw, you’ll see their heart rate go up and their blood pressure go up. This is why when they do fetal surgery, they provide fetal anesthesia. Because it does that. And they also see that if they don’t provide fetal anesthesia, long-term wise, the fetuses that don’t get the anesthesia don’t do quite as well as the ones that do. Because they went through the stress response without any accumulation. So in book, if you walk like a duck, you quack like a duck, you probably are a duck. We can’t quite ask the fetus, “Did you feel this?”

The second thing I want to say, basically, is about the article that Representative Farrar was talking about, the JAMA article from 2005, that says that basically neonates cannot feel pain up until about 29 weeks gestation. I think they state that as a very factual thing. Unfortunately, that is a very poorly written article. We have in medicine what we call not peer review, but journal club. And what we do in journal club is we look at articles that have been published, and we look at it very critically in view of what is that article saying, what is it not saying, and what are other articles that have previously existed before it, or around it; what have they said about the same thing. And as one looks at this article, you'll find that there is actually a conflict of interest. One of the significant authors is a director of an abortion clinic in San Francisco. That should have been disclosed when that article was published; it was not. Technically it was not a conflict of interest, because this article deals with fetal pain, and abortion clinics don't necessarily deal with that... but they really do, in some ways.

The second interesting thing about this article is that they come up with a statement that fetuses, or infants really cannot feel pain up until 28-29 weeks. I daresay that is not medical practice, even back in 2005. I think you would be hard pressed to find a neonatologist or a pediatric anesthesiologist that would not have given analgesia, or some type of sedative or pain reducing thing to any infant that is at 27, 28, 29 weeks, which is not unusual to be alive and requiring surgery. I think it would be malpractice for them not to do that, even in 2005.

The third point is that we need to learn from our past. Our failure to learn from our past causes us to repeat the same mistakes. When I began my training in 1980, and I am an old man... I have been doing pediatric critical care, anesthesia and pediatrics for a very long time. We were told as interns that neonates did not feel pain. We would routinely have infants that were 26-27 weeks gestation, and would try very hard to resuscitate and keep them alive. And at times we were successful at 26 weeks. Most at 30, 32 we were very successful. We were told that these little critters did not feel pain, and so when we were doing chest tubes, other procedures that required incisions, things like that, we would not routinely anesthetize them. In 1986-87, Anand came out with a landmark article saying basically they do feel pain. And you know what? He was right, we were wrong. We were told for all these years that they do not feel pain, that their crying, their heart rates and increased blood pressure, their intracranial bleeds and things like that were because of other reasons. In reality, as we looked back, we were causing them pain. All because we were told the children were not capable of feeling pain at this age. They were wrong. All I have to say is that as we look back, we would be very stupid, basically, to repeat our mistakes of the past. Fetuses do feel pain. You see that on ultrasound as people do procedures. If it quacks like a duck, sounds like a duck, walks like a duck, you know, it's a duck."

Testimony of William Polzin, M.D.

Director, Division of Maternal-Fetal Medicine,
Department of Obstetrics and Gynecology,
Good Samaritan Hospital, Cincinnati, Ohio

Associate Director of the Fetal Care Center,
Cincinnati, Ohio

Medical Director of Healthy Beginnings, Inc.

Background: I am a medical physician with 24 years of experience in the practice of women's health care, specifically as an obstetrician/gynecologist and board certified in maternal-fetal medicine. I am the Director of Maternal-Fetal Medicine at Good Samaritan Hospital in Cincinnati, Ohio. Good Samaritan Hospital is a Catholic Healthcare Institution that is the largest obstetric hospital in the State of Ohio with 32 residents in training in the field of obstetrics and gynecology. I am actively involved in their specialty training. I am also the Associate Director of the Fetal Care Center of Cincinnati, which provides care for the most complicated pregnancies where fetal birth defects impact pregnancy care. Finally, I am the Medical Director of Healthy Beginnings, a non-profit healthcare organization that provides obstetric care for under-insured women in the Cincinnati area. I have an established reputation as a leader in women's healthcare on a national level. Through this written statement, I offer my opinions regarding Kansas HB 2218 that relates to restrictions on late term abortions, amending K.S.A. 65-445. These may not represent the organizations with which I am affiliated and should not be construed as such.

In reviewing the section labeled, New Section One, paragraphs A through K, I find no factual errors and affirm that in any fetal surgery on unborn children, that anesthesia is a part of the plan and routinely administered. The inability to voice a pain response does not obviate the physician's responsibility to mitigate pain through the use of appropriately dosed medications at different gestational ages. Fetal procedures done prior to 20 weeks, or minimally invasive procedures at any gestational age, are recognized to cause some pain and the mothers are counseled regarding that. The risks and benefits of additional procedures to administer pain medication are weighed against the prospective benefit of the procedure. At no time; however, would major fetal surgery be done without adequate anesthesia delivered transplacentally via the mother or directly to the fetus.

Regarding new Section Two, I find no serious discrepancies with the terms as they are defined, specifically regarding paragraph E, "Medical Emergency." The definition is adequately written to allow care of a pregnant woman without delay in the event of an emergency, even care that would result in the immediate abortion of the fetus.

Regarding new Section Three, paragraph A, I feel the responsibility outlined for the physician providing the abortion is within the scope of proper medical practice. Written determinations, whether on paper or electronically recorded, are necessary in the comprehensive evaluation of a patient prior to any operation, including one that results in an irreversible act, such as elective or medically indicated abortion and there is no provision that would place undue restrictions upon the provider in that it mandates exercising "medical judgment arrived at using and exercising that degree of care, skill and proficiency commonly exercised by the ordinary skillful, careful and prudent physician in the same or similar circumstances." The two mandates that the abortion is necessary to preserve the life of the pregnant woman or that continuation of the pregnancy will cause a substantial and irreversible physical impairment, with the exception of self-inflicted injury is not included, is reasonable. The requirement that any written documents specify if the abortion is necessary, along with the medical basis for that determination, is

within the scope of normal and reasonable prudent practice by any health care provider in the area of women's care.

Specifically regarding the gestational age determination, in all aspects of pregnancy, proper understanding of gestational age is paramount to safely performing any procedure, including an abortion. Proper counseling of the mother is dependent upon gestational age as certain risks of hemorrhage and infection increase with advancing gestational age.

There are certain conditions unique to pregnancy that may require immediate delivery of a pregnancy regardless of gestational age. If this occurs under 20 weeks, it is by medical definition, an abortion. If it is at a gestational age by statute that is previable, it would be considered an abortion. The HB 2218 allows for delivery or abortion without respect to gestational age in the event that a medical emergency arises, and with documentation of gestational age in compliance with the bill, if the abortion is necessary to preserve the life of the pregnant woman or if continuation of the pregnancy would cause substantial or irreversible physical impairment.

Some examples of these medical conditions are as follows: Severe hypertension that is not amenable to therapy and that places the mother at risk of cerebral hemorrhage or stroke; acute myocardial infarction with or without cardiac arrest, maternal hemorrhage, either secondary to trauma or from placental abruption; and systemic maternal infection secondary to bacterial processes that may cause organ failure and cardiovascular shock or viral illnesses that may cause respiratory failure. In all these cases, delivery of the pregnancy, regardless of gestational age, may be necessary to preserve the life of the mother. After 24 weeks, preterm delivery would be an option with a good chance of intact survival of the newborn. Purposely taking the life of the fetus after 24 weeks would not be necessary in those settings. Fortunately these types of medical problems are extremely rare; however, they do arise and, with proper counseling including the medical administration, hospital administration, patients and family, a reasonable plan of action can be delineated. True life-threatening emergencies such as those described above, would not be excluded by this bill under the auspices of the medical emergency definition.

In summary, Kansas HB 2218 is an accurately worded bill that lays a basis to a reasonable description of why pain is, in fact, recognized by the fetus despite its inability to articulate the degree of pain. The pain can be registered through physiologic measurements such as heart rate and reactive movements. Severe maternal complications can occur during pregnancy that require emergent delivery, planned delivery, emergent abortion or planned abortion. There are adequate provisions within the bill to allow such medical actions.

Thank you for the opportunity to submit this testimony.

Sincerely,

William J. Polzin, M.D.

Testimony of Colleen A. Malloy, MD
Assistant Professor, Division of Neonatology/ Department of Pediatrics
Northwestern University Feinberg School of Medicine
Before the Subcommittee on the Constitution,
Committee on the Judiciary,
U.S. House of Representatives

May 17, 2012

Chairman Franks and distinguished members of the subcommittee, my name is Colleen A. Malloy. I serve as an assistant professor in the Division of Neonatology in the Department of Pediatrics at Northwestern University Feinberg School of Medicine. Thank you for this opportunity to testify regarding some of the scientific and clinical issues that are pertinent to your consideration of the District of Columbia Pain-Capable Unborn Child Protection Act (H.R. 3803).

This legislation would prohibit abortion within the District of Columbia, a federal jurisdiction, beginning at 20 weeks fetal age. This age is equivalent to 22 weeks in the "LMP" system of dating, which is commonly used in obstetrics and neonatology. The bill contains an exception for certain cases in which an abortion is deemed necessary because a grave physical condition endangers the mother's life.

With the advancement of in utero imaging, blood sampling, and fetal surgery, we now have a much better understanding of life in the womb than we did at the time that *Roe v. Wade* was handed down. Our generation is the beneficiary of new information which allows us to understand more thoroughly the existence and importance of fetal and neonatal pain. As noted in my biography, I am trained and board-certified in the field of neonatology. The standard of care in my field recognizes neonatal pain as an important entity to be acknowledged, measured, and treated.

With advancements in neonatology and perinatal medicine, we have been able to push back the age at which a neonate can be resuscitated and resuscitated successfully. When we speak of infants at 22 weeks LMP, for example, we no longer have to rely solely on inferences or ultrasound imagery, because such premature patients are kicking, moving, reacting, and developing right before our eyes in the Neonatal Intensive Care Unit.

In neonatology, we describe the age of neonates in terms of the last menstrual period (LMP) dating system, which dates a pregnancy starting with day zero as the first day of the last menstrual period. However, the actual development in the womb is commonly referred to with post-fertilization dating. This bill utilizes the post-fertilization system of dating. These approaches are equally valid, as long as one remembers which dating system is being employed in any particular discussion. The LMP age is the post-fertilization age, plus two weeks. Thus, the cutoff point in this legislation is 20 weeks after fertilization, which would be 22 weeks in the LMP system. In today's medical arena, we resuscitate patients at this age and are able to witness their ex-utero growth and development.

Medical advancement and technology have enabled us to improve our ability to care for these infants. In June 2009, the *Journal of American Medical Association* reported a Swedish series of over 300,000 infants. Survival to 1 year of life of live born infants at 20, 21, 22, 23, and 24 weeks post-fertilization age was 10%, 53%, 67%, 82%, and 85%, respectively. In September 2010, *Pediatrics* reported survival to discharge rates of 9575 infants at a number of academic institutions in the US.

The results were similar, with survival at 20, 21, 22, 23, and 24 weeks post-fertilization age being 6%, 26%, 55%, 72%, and 84%, respectively. As we provide care for all these survivors, we are able to witness their experiences with pain. In fact, standard of care for neonatal intensive care units requires attention to and treatment of neonatal pain. There is no reason to believe that a born infant would feel pain any differently than that same infant were he or she still in utero. Thus, the difference between fetal and neonatal pain is simply the locale in which the pain occurs. The receiver's experience of the pain is the same. I could never imagine subjecting my tiny patients to horrific procedures such as those that involve limb detachment or cardiac injection.

There is ample biologic, physiologic, hormonal, and behavioral evidence for fetal and neonatal pain. As early as 8 weeks post-fertilization, face skin receptors appear. At 14 weeks, sensory fibers grow into the spinal cord and connect with the thalamus. At 13-16 weeks, monoamine fibers reach the cerebral cortex, so that by 17-20 weeks the thalamo-cortical relays penetrate the cortex. Many authors have substantiated that pain receptors are present and linked by no later than 20 weeks post-fertilization. (Myers 2004; Derbyshire 2010; Anand 1987; Vanhalto 2000; Brusseau 2008; VanScheltema 2008). In fact, by 20 weeks post-fertilization (22 weeks by LMP), the fetal brain has the full complement of neurons that are present in adulthood (Lagercrantz H et al. *Functional development of the brain in fetus and infant*. Lakartidningen 1991;88:1880-85).

At 19-20 weeks post-fertilization, electroencephalogram (EEG) recordings are possible (Flower MJ. *Neuromaturism of the human fetus*. J Med Philos 1985;10:237-251). We have no difficulty performing EEG studies on infants at this gestational age. At 22 weeks, continuous EEGs reflect awake and REM sleep state typical of neonate.

In the Neonatal Intensive Care Unit, we can witness first hand the change in vital signs associated with pain. When procedures such as IV placement or chest tube insertion are performed on neonates at 20 weeks post-fertilization age and above, the response is similar to those seen in older infants or children. With the advent of ultrasound including real-time ultrasound, we know that even at 8 weeks post fertilization, the fetus makes movements in response to stimuli. At 20 weeks post-fertilization, the fetus responds to sound, as mothers will commonly report increased fetal movement in response to music, sirens, or alarms.

At 23 weeks in utero, a fetus will respond to pain (intrahepatic needling, for example) with the same pain behaviors as older babies: screwing up the eyes, opening the mouth, clenching hands, withdrawal of limbs. In addition, stress hormones rise substantially with painful blood puncture, beginning at 18 weeks gestation (Giannakouloupoulos X, Sepulveda W, Kourtis P, Glover V, Fisk NM. "Fetal plasma cortisol and beta-endorphin response to intrauterine needling," *Lancet* 1994;344:77-81). This hormonal response is the same one mounted by born infants.

In addition, use of analgesia during neonatal surgery is standard of care; any infant undergoing fetal surgery is expected to receive appropriate pain medication as adults receive. In a 1992 study published in the *New England Journal of Medicine*, infants undergoing cardiac surgery had large increases in adrenaline, noradrenaline, and cortisol levels. Opioid analgesia markedly reduced these responses, as well as reduced peri-operative mortality.

Moreover, the fetus and neonate born prior to term may have an even heightened sensation of pain compared to an infant more advanced in gestation. There is ample evidence to show that while the pain system develops in the first half of pregnancy, the pain modulating pathways do not develop until the second half. It is later in pregnancy that the descending, inhibitory neural pathways mature,

which then allow for dampening of the pain experience. As reported in the *British Journal of Obstetrics and Gynecology*, the "... fetus may actually be more sensitive than the older child, and [this] may explain why the newborn shows exaggerated behavioral responses to sensory provocation" (*Br J Obs Gyn* 1999;106:881-886).

The idea that premature infants actually have greater pain sensitivity is supported by the fact that while pain transmitters in the spinal cord are abundant early on, pain inhibiting transmitters are sparse until later. (Anand KS, McGrath PJ, editors. *Pain Research and Clinical management*. Vol. 5. *Pain in neonates*. Amsterdam:Elsevier 1993:19-38). In addition, compared to the older infant, the premature infant requires greater concentrations of medications to maintain effective anesthesia. Thus, the fetus and premature infant appear to be even more susceptible to the pain experience.

In conclusion, I have no doubt that my premature neonatal patients feel and experience pain. Even early on, they demonstrate personalities and interact positively as well as negatively with their environments. With our advanced "views into the womb," we are now able to appreciate the active life of the developing fetus as one who is engaged with his or her uterine locale. I firmly believe, as the evidence shows, that the fetal pain experience is no less than the neonatal or adult pain experience. It may even be greater than that which you or I would experience from dismemberment or other physical injury.

One of the most basic of government principles is that the state should protect its members from harm. Technology, imaging, and clinical neonatology enable us to know much more about fetal life than ever before. We now understand the fetus to be a developing, moving, interacting member of the human family who feels pain as we do. If we are to be a benevolent society, we are bound to protect the fetus. We should not tolerate the gruesome and painful procedures being performed on the smallest of our nation.

Testimony of Anthony Levatino, MD, JD

before the Subcommittee on the Constitution,

Committee on the Judiciary,

U.S. House of Representatives

on The District of Columbia Pain-Capable Unborn Child Protection Act (H.R. 3803)

May 17, 2012

Chairman Franks and distinguished members of the subcommittee, my name is Anthony Levatino. I am a board-certified obstetrician gynecologist. I received my medical degree from Albany Medical College in Albany, New York in 1976, and completed my OB-GYN residency training at Albany Medical Center in 1980. In my 32-year career, I have been privileged to practice obstetrics and gynecology in both private and university settings. From June 1993 until September 2000, I was associate professor of OB-GYN at the Albany Medical College, serving at different times as both medical student director and residency program director. I have also dedicated many years to private practice and currently operate a solo gynecology practice in Las Cruces, New Mexico. I appreciate your kind invitation to address issues related to the District of Columbia Pain-Capable Unborn Child Protection Act (H.R. 3803).

During my residency training and during my first five years of private practice, I performed both first and second-trimester abortions. During my residency years, second-trimester abortions were typically performed using saline infusion or, occasionally, prostaglandin instillation techniques. These procedures were difficult, expensive and necessitated that patients go through labor to expel their pre-born children. By 1980, at the time I entered private practice first in Florida and then in upstate New York, those of us in the abortion industry were looking for a more efficient method of second-trimester abortion. We found that the "Suction dilation and evacuation" procedure (or "Suction D&E") offered clear advantages over older installation methods. The procedure was much quicker and never ran the risk of a live birth.

Understand that my partner and I were not running an abortion clinic. We practiced general obstetrics and gynecology, but abortion was definitely part of that practice. Relatively few gynecologists in upstate New York would perform such a procedure at the time, and we saw an opportunity to expand our abortion practice. I performed first-trimester suction dilation and curettage abortions in my office up to 10 weeks from last menstrual period and later procedures in an outpatient hospital setting. From 1981 through February 1985, I performed approximately 1200 abortions. Over 100 of them were second-trimester Suction D&E procedures up to 24 weeks gestation, by which I mean 24 weeks from the first day of the woman's last menstrual period (LMP), which is equivalent to 22 weeks post-fertilization age.

As an aside, both the LMP dating system and the post-fertilization dating system are equally valid and both are found in the practice of medicine and in mainstream medical literature. Most if not all embryology textbooks, for example, typically date fetal development in terms of days or weeks post-fertilization. In clinical obstetrics we use the LMP system. Both are perfectly valid. It is only necessary that one specify which system is being utilized, and H.R. 3803 does that. Any competent physician can read the definitions in H.R. 3803 and understand exactly where the cut off line is.

Imagine, if you can, that you are a pro-choice obstetrician/gynecologist like I once was. Your patient today is 24 weeks pregnant (LMP). At twenty-four weeks from last menstrual period, her uterus is two finger-breadths above the umbilicus. If you could see her baby, which is quite easy on an ultrasound, she would be as long as your hand plus a half, from the top of her head to the bottom of her rump, not counting the legs. Your patient has been feeling her baby kick for the last month or more, but now she is asleep on an operating room table and you are there to help her with her problem pregnancy.

The first task is to remove the laminaria that had earlier been placed in the cervix, the opening to the uterus, to dilate it sufficiently to allow the procedure you are about to perform. With that accomplished, direct your attention to the surgical instruments arranged on a small table to your right. The first instrument you reach for is a 14-French suction catheter. It is clear plastic and about nine inches long. It has a bore through the center approximately $\frac{3}{4}$ of an inch in diameter. Picture yourself introducing this catheter through the cervix and instructing the circulating nurse to turn on the suction machine, which is connected through clear plastic tubing to the catheter. What you will see is a pale yellow fluid that looks a lot like urine coming through the catheter into a glass bottle on the suction machine. This is the amniotic fluid that surrounded the baby to protect her.

With suction complete, look for your Sopher clamp. This instrument is about thirteen inches long and made of stainless steel. At the business end are located jaws about 2 inches long and about $\frac{1}{2}$ an inch wide with rows of sharp ridges or teeth. This instrument is for grasping and crushing tissue. When it gets hold of something, it does not let go. A second trimester D&E abortion is a blind procedure. The baby can be in any orientation or position inside the uterus. Picture yourself reaching in with the Sopher clamp and grasping anything you can. At twenty-four weeks gestation, the uterus is thin and soft so be careful not to perforate or puncture the walls. Once you have grasped something inside, squeeze on the clamp to set the jaws and pull hard – really hard. You feel something let go and out pops a fully formed leg about six inches long. Reach in again and grasp whatever you can. Set the jaw and pull really hard once again and out pops an arm about the same length. Reach in again and again with that clamp and tear out the spine, intestines, heart and lungs.

The toughest part of a D&E abortion is extracting the baby's head. The head of a baby that age is about the size of a large plum and is now free floating inside the uterine cavity. You can be pretty sure you have hold of it if the Sopher clamp is spread about as far as your fingers will allow. You know you have it right when you crush down on the clamp and see white gelatinous material coming through the cervix. That was the baby's brains. You can then extract

the skull pieces. Many times a little face may come out and stare back at you. Congratulations! You have just successfully performed a second-trimester Suction D&E abortion.

If you refuse to believe that this procedure inflicts severe pain on that unborn child, please think again.

Before I close, I want to make a comment on the claims that I often hear that we must keep abortion legal in order to save women's lives, or prevent grave physical health damage, in cases of acute conditions that can and do arise in pregnancy. Albany Medical Center, where I worked for over seven years, is a tertiary referral center that accepts patients with life-threatening conditions related to or caused by pregnancy. I personally treated hundreds of women with such conditions in my tenure there. There are several conditions that can arise or worsen, typically during the late second or third trimester of pregnancy, that require immediate care. In many of those cases, ending or "terminating" the pregnancy, if you prefer, can be life saving, but "terminating a pregnancy" does not necessarily mean "abortion." I maintain that abortion is seldom if ever a useful intervention in these cases.

Here is why: Before a Suction D&E procedure can be performed, the cervix must first be sufficiently dilated. In my practice, this was accomplished with serial placement of laminaria. Laminaria is a type of sterilized seaweed that absorbs water over several hours and swells to several times its original diameter. Multiple placements of several laminaria at a time are absolutely required prior to attempting a suction D&E. In the mid-second trimester, this requires approximately 36 hours to accomplish. If one were to use the alternate method defined in federal law as Partial-Birth Abortion (but now generally banned), this process requires three days, as explained by Dr. Martin Haskell in his 1992 paper that first described this type of abortion.

In cases where a pregnancy places a woman in danger of death or grave physical injury, a doctor more often than not doesn't have 36 hours, much less 72 hours, to resolve the problem. Let me illustrate with a real-life case that I managed while at the Albany Medical Center. A patient arrived one night at 28 weeks gestation with severe pre-eclampsia or toxemia. Her blood pressure on admission was 220/160. A normal blood pressure is approximately 120/80. This patient's pregnancy was a threat to her life and the life of her unborn child. She could very well be minutes or hours away from a major stroke. This case was managed successfully by rapidly stabilizing the patient's blood pressure and "terminating" her pregnancy by Cesarean section. She and her baby did well. This is a typical case in the world of high-risk obstetrics. In most such cases, any attempt to perform an abortion "to save the mother's life" would entail undue and dangerous delay in providing appropriate, truly life-saving care. During my time at Albany Medical Center I managed hundreds of such cases by "terminating" pregnancies to save mother's lives. In all those cases, the number of unborn children that I had to deliberately kill was zero.