

Science of Fetal Pain at 20 Weeks

Unborn babies can feel pain by 20 weeks gestation or earlier

- The old, uninformed notions that unborn and newborn babies could not feel pain are refuted by a growing body of scientific evidence. The published scientific literature shows that unborn babies can experience pain at 20 weeks gestational age (20 weeks LMP, since Last Menstrual Period, the fetal age estimate used by most obstetricians) or earlier. There are two common methods used to measure the age of an unborn baby: Probable post-fertilization age (PPF, used by embryologists) measures the age of the unborn baby from the actual date of conception, while gestational age measures from the first day of the mother's last menstrual period (LMP, approx. two weeks before conception). Medical practitioners have been using the latter method as standard medical practice for decades, and for the purpose of this paper ages refer to gestational age unless otherwise indicated.
- Embryological development shows presence of pain sensory mechanisms and neurophysiology. The basic anatomical organization of the human nervous system is established by 6 weeks .¹ The earliest neurons in the cortical brain (the part responsible for thinking, memory, and other higher functions) are established starting at 6 weeks .² Nerve synapses for spinal reflex are in place by 10 weeks .³ Sensory receptors for pain (nociception) develop first around the mouth at 7 weeks , and are present throughout the skin and mucosal surfaces by 20 weeks .⁴ Connections between the spinal cord and the thalamus (which functions in pain perception in fetuses as well as in adults⁵) are relatively complete by 20 weeks .⁶
- In contradiction of the claim that the brain cortex is necessary to experience pain and suffering, decordate individuals as well as animals lacking higher cortical structures obviously do feel pain. In fact, the human brain cortex does not fully mature until approximately 25 years of age, yet infants, children, and teenagers obviously can experience pain.⁷
- Fetal reactions provide evidence of pain response. The unborn baby reacts to noxious stimuli with avoidance reactions and stress responses. As early as 8 weeks the baby exhibits reflex movement during invasive procedures.⁸ There is extensive evidence of a hormonal stress response by unborn babies as early as 18 weeks⁹ including "increases in cortisol, beta-endorphin, and decreases in the pulsatility index of the fetal middle cerebral artery."¹⁰ Two independent studies in 2006 used brain scans of the sensory part of unborn babies' brains, showing response to pain.¹¹ They found a "clear cortical response" and concluded there was "the potential for both higher-level pain processing and pain-induced plasticity in the human brain from a very early age."
- Dr. Ruth Grunau, a pediatric psychologist at the University of British Columbia, said, "We would seem to be holding an extraordinary standard if we didn't infer pain from all those measures."¹²
- Brain responses & connections. In 2013 a study used functional magnetic resonance imaging (fMRI) to study the brains of healthy human babies still within the womb, from 24-39 weeks . They found that functional neuronal connections sufficient to experience pain already exist by 24 weeks .¹³
- Increased sensitivity to pain. In 2010 one group noted that "the earlier infants are delivered, the stronger their response to pain."¹⁴ This increased sensitivity is due to the fact that the neural mechanisms that inhibit pain sensations do not begin to develop until 34-36 weeks , and are not complete until a significant time after birth.¹⁵ This means that unborn, as well as newborn and preterm, infants show "hyperresponsiveness" to pain.¹⁶ Authors of a 2015 study used the fMRI technique to measure pain response in newborns (1-6 days old) vs. adults (23-36 years old), and found that "the infant pain experience closely resembles that seen in adults."¹⁷ Babies had 18 out of 20 brain regions respond like adults, yet they showed much *greater* sensitivity to pain, responding at a level four times as sensitive as adults.

Unborn babies are treated as patients by fetal surgeons, and receive pain medication

- Fetal surgeons recognize unborn babies as patients. A leading children's hospital performed nearly 1,600 fetal surgeries between 1995 and June 2017.¹⁸ Perinatal medicine now treats unborn babies as young as 18 weeks for

dozens of conditions. Pain medication for unborn patients is routinely administered as standard medical practice.¹⁹

- One of the premier fetal surgeons makes the obvious point: “Fetal therapy is the logical culmination of progress in fetal diagnosis. In other words, the fetus is now a patient.”²⁰
- A European fetal surgery team states: “The administration of anesthesia directly to the fetus is critical in open fetal surgery procedures.”²¹
- The leading textbook on clinical anesthesia says: “It is clear that the fetus is capable of mounting a physiochemical stress response to noxious stimuli as early as 18 weeks.”²²
- A recent review of the evidence concludes that from the 15th week of gestation onward, “the fetus is extremely sensitive to painful stimuli, and that this fact should be taken into account when performing invasive medical procedures on the fetus. It is necessary to apply adequate analgesia to prevent the suffering of the fetus.”²³
- A prenatal surgery group that has performed many fetal surgeries informs the mother before the surgery:²⁴ “You will be given general anesthesia, and that anesthesia will put your baby to sleep as well. In addition, during the prenatal surgery, your unborn baby will be given an injection of pain medication and medication to ensure that the baby doesn’t move.”

Babies are surviving and thriving at ever younger pre-term ages when given appropriate care and treatment

- Survival of extremely preterm infants has increased significantly as doctors realize the advantages of active care for such young patients. The ages of survival have dropped from 28 weeks to 24 weeks and now less than 22 weeks.²⁵
- Groundbreaking *New England Journal of Medicine* study demonstrated that babies delivered as young as 22 weeks can survive, and active intervention for treatment greatly improves their survival.²⁶
- An NIH-funded study of infants who were delivered at 22-24 weeks and who received active treatment observed increasing rates of survival without any neurological impairment. Yet, three-fourths of those delivered at 22 weeks still received no active care.²⁷
- 60% of infants born at 22 weeks who receive active hospital treatment will survive.²⁸

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