

*Neonatal Pain:
Suffering, Pain, and Risk of Brain Damage in the Fetus and Newborn*

edited by Giuseppe Buonocore and Carlo V. Bellieni

184 pp., with index, paperback, \$139.00
Springer-Verlag, 2008, ISBN 978-88-470-0731-4

Does the unborn child experience pain? Four years ago, during congressional debate over the Unborn Child Pain Awareness Act, which would have required physicians to tell women that unborn children can experience pain during an abortion if the fetus were not given analgesia, a dispute over fetal pain—if it exists and when it occurs—arose in the United States. *Neonatal Pain*, published by Springer-Verlag, presents nineteen contributions by an international group of physicians and scientists which describe and review recent medical studies indicating that fetuses and newborns do suffer pain and stress and that these stresses may have adverse effects on the children's mental, physical, and emotional development.

The editors of *Neonatal Pain* are Drs. Giuseppe Buonocore and Carlo V. Bellieni of the Department of Pediatrics, Obstetrics, and Reproduction Medicine of the University of Siena in Italy. Despite several technical articles that would be difficult for non-experts to comprehend, the editors and authors present a compelling case that suggests that health care professionals and parents should invest more time and attention to the alleviation of pain in fetuses and in newborns. The book is unusually expensive, and is likely to be found only in library collections.

In their brief introduction, the editors make an important distinction between pain and suffering. Pain is a “fundamentally ‘physical’ phenomenon, *the clash arising from an attack on one’s physical integrity*” (2, original emphasis). In contrast, suffering can be defined as “the clash arising from an attack on the integrity of one’s self as a person” (2). The editors then affirm that their book “will show that [newborns] can feel pain even before birth” (1).

Neonatal Pain is divided into five sections. Part 1, “Delivery and Pain,” opens the collection with a section of three chapters that

explore the pain of childbirth for both the mother and her child. Two chapters are brief, summarizing what we know about the role of gonadal hormones in pain (chapter 1) and about the clinical management of pain during childbirth (chapter 3). The most significant contribution in this section, however, is chapter 2, “Stress and Pregnancy: CRF as Biochemical Marker.” This essay focuses on the hormone CRF (corticotropin-releasing factor), which is normally released by the human placenta in response to stress. Several scientific studies, reviewed in this chapter, suggest that the hormone is present in *both* the mother and the fetus before and during childbirth, suggesting that the child himself, like his mother, experiences the stress of birth.

Buonocore and Bellieni devote the second part of their book specifically to fetal pain. The four chapters in this section, which will be accessible to readers from a range of academic backgrounds, concur that the fetus can feel pain, but that it is difficult to determine the intensity of this pain or measure the fetus's response to it with absolute certainty. Chapter 4 summarizes the findings of a study that showed that thirty- to forty-week-old fetuses are able to learn how to adapt to different sounds while in the womb, which suggests that they already have a relatively sophisticated nervous system. Chapter 5 explains haptonomy, the study of tactile contact and the examination of the links that bind body and mind. This essay specifically explores the relationship between the mother, father, and child and its consequences for the family. Chapter 6 reviews the literature that shows that fetuses manifest different pain indicators—anatomical, cytochemical, neurophysiological, hormonal, and behavioral—that suggest that they experience pain.

For the Catholic bioethicist, the most valuable chapter in the second part of *Neonatal*

Pain is chapter 7, "New Insights into Prenatal Stress: Immediate and Long-Term Effects on the Fetus and Their Timing," by K. O'Donnell and V. Glover. This chapter, which summarizes the biological findings described in the other chapters, provides an accessible and valuable resource for the nonscientific expert. The authors also cover the psychological aspects of prenatal maternal stress on the fetus and highlight potential health problems in the fetus and developing child that may arise in response to pain and stress. O'Donnell and Glover conclude that "the effects of prenatal stress on child outcome should be a major public health concern" (62).

Part 3, "Neonatal Pain," focuses on the pain of the newborn and different methods to alleviate this pain. One important conclusion of this part of the book is that the pain experienced by the newborn can have severe negative consequences on the development of the child, though, as the editors point out in chapter 8, it is difficult to determine precisely the pain level that the neonate experiences. In chapter 9, "Analgesic Procedures in Newborns," L. Giuntini and G. Amato describe different pain control techniques that can be used during the neonatal period.

The remaining chapters of this third section cover nonpharmacological and pharmacological methods of analgesia for fetuses and neonates. Nonpharmacological methods of pain relief are especially important for neonates because of the concern that drugs could have detrimental effects on the developing infant. Moreover, nonpharmacological pain relief is inexpensive and can be administered by the parents of the child. In chapter 11, in one of their own articles, Buonocore and Bellieni specifically examine sensory saturation, a type of nonpharmacological analgesic that involves the stimulation of the neonate during a minor painful procedure. The authors state that "these stimuli compete with the pain transmission to the central nervous system" (99). The authors explain that sensory saturation is a more effective analgesic than oral sugar solution or non-nutritive sucking. An important point that the authors emphasize is that the neonates

require a "human presence that accompanies, distracts, and comforts them" (100).

The last chapter of the section on neonatal pain, "Physical Stress Risk Agents in Incubators," by R. Sisto, is extremely technical, and the valuable information regarding the risks present in incubators can easily be lost in the difficult scientific language. However, the chapter has an important conclusion: Neonates could be particularly vulnerable to noise, and the incubator is a particularly noisy environment.

Part 4, "Pain: A Risk Factor for Brain Damage," focuses on the adverse effects of pain on the development of both the fetus and the neonate. Buonocore and Bellieni include this information to reinforce the primary conclusion of their book, that pain in fetuses and newborns must be alleviated because it leads to detrimental effects in their development. Chapter 14, "Neonatal Stressors," by M. Delivoria-Papadopoulos and O. P. Mishra, presupposes substantial biological knowledge, which may make this interesting article difficult to read. In it, the authors examine the mechanisms of apoptosis, also known as cell death, in the newborn brain that lacks oxygen. From the experiments described in the chapter, the authors conclude that brain damage occurs after hypoxia as a result of increased apoptosis. Their findings have important implications for the field of neonatal pain because they shed light on a possible biological reason for the brain damage that occurs after exposure to pain.

The final chapter in the fourth part of *Neonatal Pain* outlines the biological effects that pain can have on the developing child. Its author, Kanwaljeet S. Anand, is a pediatrician at the University of Arkansas for Medical Sciences and an acknowledged expert on neonatal pain who testified before the United States Congress during the debate over the Unborn Child Pain Awareness Act. In this chapter, Anand describes a study showing that the mean IQ score of ex-preterm children is eleven points lower than that of children born from term pregnancies. To explain this, he appeals to animal studies that suggest that exposure to neonatal pain promotes an increased susceptibility to chronic pain

states mediated by a neurotransmitter called NMDA. NMDA is known to be involved in a cell-death mechanism, suggesting the theory that “NMDA-mediated excitotoxicity resulting from repetitive or prolonged pain and enhanced apoptosis due to maternal separation are the two primary mechanisms leading to enhanced neuronal cell death in the immature brain” (144). Anand concludes that to avoid brain damage, is it important to better understand the effects of pain on the neonate and the methods used to ameliorate the pain.

In the fifth and final section of the book, “Pain and Communication,” Buonocore and Bellieni include three chapters that review the ways in which health care professionals should communicate with parents about the health of their unborn or newly born child. These essays conclude that physicians and nurses need to express compassion, clarity, and support when they approach the parents of these children. They have to pay particular attention to the emotional state of the mother, since studies have shown that maternal stress does have negative effects on the health of the child.

In conclusion, *Neonatal Pain* is an effective collection of articles that demonstrates that fetuses and newborns can feel pain and that this pain has detrimental effects on their development. The chapters that summarize the scientific and medical literature are particularly convincing. This empirical finding has moral implications. Most importantly, advocates on both sides of the abortion debate should be able to agree, at the least, that it would be only humane to administer analgesia to a fetus prior to an abortion procedure. It is a sad reality of the polarization in our society that the Unborn Child Pain Awareness Act failed to pass in the United States Congress.

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By Their Fruits:

Eugenics, Population Control, and the Abortion Campaign

by Ann Farmer

442 pp., appendices, bibliographic notes and index, hardcover, \$79.95
Catholic University of America Press, 2008, ISBN 978-0-81321-530-3

In recent years, I have reviewed three books dealing with the role of eugenics in twentieth-century campaigns for social reform: Ian Dowbiggin’s *A Merciful End: The Euthanasia Movement in Modern America* (2003); Christine Rosen’s *Preaching Eugenics: Religious Leaders and the American Eugenics Movement* (2004); and now Ann Farmer’s *By Their Fruits: Eugenics, Population Control, and the Abortion Campaign* (2008).

The first study found the roots of the American euthanasia movement in the eugenic convictions of the early twentieth-century

disciples of Charles Darwin and Francis Galton—the orators, politicians, academics, jurists, and novelists who championed the spread of scientific knowledge and progressivism. The second book focused on roles played by prominent Protestant and Catholic clergy, as well as leading Jewish rabbis, in spreading or thwarting eugenics. Ann Farmer’s comprehensive new study searches the writings and associations of the women and men who led the campaign for reform of English abortion laws from the 1930s to passage of the 1967 Abortion Act and after, to get to the heart of their motives.