

This response was submitted to the consultation held by the Nuffield Council on Bioethics on Critical Care Decisions in Fetal and Neonatal Medicine: Ethical issues during March to June 2005. The views expressed are solely those of the respondent(s) and not those of the Council.

Anon 5

XXX alerted me to your consultation paper, *the ethics of prolonging life in fetuses and the newborn*, and wondered if I might write a short comment on the topic of fetal pain, as you mention it within the paper. I realise that you do not include a question directly on this issue and so may not welcome such a comment. Nevertheless, the following is available for your use should you find it valuable and/or interesting.

The consultation paper addresses fetal pain quite carefully, which is commendable, and states that: “As the baby grows, its brain gradually develops the ability to recognise and process pain in an adult way.” I believe that statement is essentially correct and offer additional comments to substantiate that position.

Many people think of pain as being the product of an alarm system. In this model, a noxious stimulus can be seen as an event that activates free nerve endings in the skin similar to pushing an alarm button. The electric cable from the button to the alarm can also be seen as similar to the connection between the nerve endings and the brain. Finally, the brain is similar to the alarm ringing out pain. This is a reasonable heuristic but it has a major limitation in that it ejects the contents of pain experience. Pain is defined in terms of a stimulus that is deemed to be painful because it elicits the pain response. Put simply: pain is defined as pain.

The alarm model is a reasonable description of the “nociceptive system”, which describes the physiological and innate or natural reaction to a noxious event. But human development is more than about hooking ‘alarms’ up to ‘buttons’, it is also about allowing conscious experience.

Theories of human development assume that the early mind has minimal content that gradually evolves into the rich and effortless experience of older children and adults. Although the view of a neonate as a blank slate, or *tabula rasa*, is generally rejected, it is broadly accepted that psychological processes have content concerning people, objects and symbols, which lies in the first instance outside the brain. If pain is dependent upon content that exists, in the first instance, outside the brain then pain cannot be possible in the fetus regardless of neural development or the development of an “alarm system”.

Before an infant can think about objects or events, or experience sensations and emotion (including pain), the elements of thought must have their own independent existence in the infant’s mind. This is something that is achieved via continued brain development in conjunction with discoveries made in action and in patterns of mutual adjustment and interactions with the infant’s caregiver. The development of representational memory, which allows an infant to respond and to learn from stored information rather than respond to material directly available, may be considered a building block, if not a cornerstone, of conscious development. Representational memory begins to emerge as the frontal cortex develops between 2 and 4 months of age. From this point on there is the possibility of tagging in memory, or labeling as a ‘something’, all the objects, emotions and sensations that appear or are felt. When a primary caregiver points to a spot on the body and asks, “does that hurt?” she is providing content and enabling an internal discrimination and with it experience. This type of interaction thus provides for content and symbols that allow the infant to

This response was submitted to the consultation held by the Nuffield Council on Bioethics on Critical Care Decisions in Fetal and Neonatal Medicine: Ethical issues during March to June 2005. The views expressed are solely those of the respondent(s) and not those of the Council.

locate and anchor emotions and sensations. It is only in this way that she can arrive at a particular state of being within her own mind. Although pain experience is clearly individual it is created by a process that extends beyond the individual.

This is likely to strike any reader as strange because it is simply not how we intuitively feel pain to be. Because pain is so highly automatic and personal we perceive it to be both natural and private. But the fact that we become able to experience pain as such a personal event does not mean that it was all by ourselves we acquired the ability to experience pain in the first place. Nor does it mean that the psychological mechanisms by which we experience pain are things that arose within our own brains by some individualistic process such as neuronal maturation.

This is not to deny that the neonate and fetus have the neural apparatus to discriminate information; clearly, the fetus and neonate do not respond to tactile stimuli in the same way as they do to auditory stimuli, for example. Indeed, this discriminatory processing is the raw material for a primary caregiver's assessments of their infants need and for the interactions and behavioral adjustments that will occur in the forthcoming months. Innate neural and behavioral discrimination are part of the material for developing experiential discrimination, but experiential discrimination is yet to develop and relies critically upon interactions with a primary caregiver. For the fetus and newborn neonate, these interactions are still to occur.

By this line of reasoning the fetus can not be held to experience pain. Not only is the biological development to support pain experience still ongoing but the post-birth environment, so necessary to the development of pain experience, is yet to make itself felt.

As the consultation paper specifically rejects consideration of abortion I will not look at policy implications for abortive procedures. The paper does, however, mention fetal surgery and so I will consider the implications for guiding possible invasive therapeutic practice.

Earlier beliefs by pediatric anesthetists that newborns and neonates could not feel pain led to an under-utilization of analgesic medication in these populations. Prior to controlled trials, however, there were reasonable concerns about intraoperative hypotension caused by the anesthesia of infants, and about postanesthesia apnea and respiratory depression that might result from narcotic analgesia. There is now sufficient evidence that risks from anesthetic or analgesic intervention during procedures on neonates and infants are outweighed by the clinical benefits. Should pediatric anesthetists return to a view that the neonate cannot feel pain, the clinical benefits of anesthetic intervention will remain. A lack of pain experience provides no ethical or practical reason to justify returning to a regimen of lesser anesthetic or analgesic intervention.

Similarly, however, should evidence reveal that the introduction of an anesthetic or analgesic regimen undermines clinical outcomes then a presence of pain experience may still be insufficient to mandate use of that anesthetic or analgesic regimen. The major clinical outcomes that are important to neonates and their families are survival and normal long-term neurodevelopment. This is in distinction to the trajectory of some policy suggestions where the primary concern of the pediatric health care provider is seen to be the treatment of the stress or pain experience. In at least some cases, stopping pain is not the priority; rather it is preventing death and long term

This response was submitted to the consultation held by the Nuffield Council on Bioethics on Critical Care Decisions in Fetal and Neonatal Medicine: Ethical issues during March to June 2005. The views expressed are solely those of the respondent(s) and not those of the Council.

complications. A primary concern of preventing pain and stress during pediatric health care would, for example, have blocked early efforts to cure childhood leukemia because the treatments were exceptionally noxious.

Several centers have now begun to perform open and closed fetal surgeries for conditions such as lower urinary tract obstruction, hydrothorax, cystic adenomatous malformation of the lung, congenital diaphragmatic hernia, and large sacrococcygeal teratomas. Enthusiasm for use of analgesia and anesthetic in the fetus undergoing such procedures must be tempered against the possibility of adverse effects on the fetus when it is undergoing dramatic neural development. Extrapolation from experiences with premature infants to the fetus must also be tempered against the possibility of adverse effects upon the fetal environment that may disturb the conditions that facilitate normal neural development. It is tempting to assume that what has been proven to be of clinical benefit in the neonate will also be of benefit in the fetus. However, the greater immaturity of the fetus and the very different hormonal and physical environment indicate that clinical trials should be performed with fetal patients to demonstrate improved outcomes. There is currently no evidence-based fetal anesthesia or analgesia protocol defined for these procedures.

I hope you find these comments to be useful. If you do have any questions I will be most happy to answer them.