

Babies Remember Pain

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Full Text: Headnote ABSTRACT: Babies have been crying at birth for centuries but we have been reluctant to accept their cries as valid expressions of pain which will register in memory. Despite mounting evidence, the characteristic reaction of psychologists and medical practitioners to infant pain has been one of denial. Key myths about the brain have provided the rationale for painful procedures. Against this background, studies of the infant cry prove that crying is meaningful communication. Examples of prenatal and perinatal cries are examined. Evidence for the pain of circumcision is found in personal memories and research findings. A final section focuses on pain in the NICU, the delivery room, and the nursery and concludes with an appeal that all painful procedures imposed on newborns be reconsidered. My granddaughter Bevin, at age 2, while talking about her birth experience, asked her parents, "Why did they poke me with a thing?" Her mother asked, "What thing?" "Like a pencil," she said. "They hurted me." She was probably referring to the heel stick, the routine way to take a blood sample from newborns in hospital birth. Bevin remembered the pain of it. Brenda, hypnotized at age 29, had this memory of pain in the delivery room: Now she's scooping me up from the doctor and laying me on this cold, cold, horribly hard, metal scales. It's so straight and so hard against my back. And I'm screaming because it is so painful! It hurts so much to be on this hard thing . . . I am screaming and screaming and no one is coming. Someone put something in my eyes! It's so cold; it stings, it burns . . . I'm still screaming . . . That was as hard as I could cry! It hurt . . . Such personal reports of pain at birth are new. Dare we believe them? Babies have been crying at birth for centuries but we have had a hard time treating their cries as meaningful. A lusty cry in the delivery room is a relief to both parents and professionals, the occasion for smiles and laughter. This is understandable but not entirely appropriate. Instead of responding to cries as authentic communication, birth professionals have proceeded to cause pain with the conviction that pain is merely reflexive and that owing to the immaturity of the infant brain, the pain could not really matter. From the perspective of present knowledge, these key 19th Century beliefs are only myths, but tragically, they are mega myths still influencing mainstream psychology and obstetrics today. DENIAL OF PAIN For thousands of years, ignorance has separated us from a factual understanding of babies, an information gap that has been filled only in the last two decades. Long-standing prejudices toward babies are still visible in our attitude toward their age or size. They will become real persons when they are older or can speak our language. Overlooking the evidence to the contrary, we persist in believing that their senses are not developed and their brain unable to record memory or organize experience into meaning. Thus, newborn pain is not like our pain (Maurer & Maurer, 1988, pp 33-36, 218)-a claim used in the nottoo-distant past to discount the pain of minorities and slaves. In modern India the cruel practice of branding infant tummies with hot irons continues in rural areas under the influence of witchdoctors. The pain is thought to be good for them (Chandra, 1988), an idea sometimes advanced in the United States in regard to birth trauma (Lagercrantz & Slotkin, 1986). Trauma is "good" because it activates endorphins and prepares the baby for real life. How can endorphins justify trauma? Experiments with rats show that when you shock their feet, their production of endorphins will shoot up as much as 600%, but is this any reason to shock them in the foot? Pain is not good for rats or babies. It was only in the last three years that American parents discovered the longstanding practice of surgeons to operate on infants without the use of painkillers (Birth, June 1986, Letters, 124-125). Adding horror to this discovery, parents uncovered the fact that major surgery on premature infants and children up to 15 months of age was typically done with the aid of curare (Pavulon) which paralyzes them but does not relieve pain. Thus, while experiencing the surgery fully, it

was not possible for them to move or to utter a cry of alarm! Surgeons acted in this way because of certain assumptions which have turned out, in retrospect, to be false. The principal assumption was the classic one that the infant brain was not working but in addition, they believed the anesthesia might be more damaging than the ordeal of the surgery itself, a belief that has turned out to be false (Anand & Hickey, 1987, p. 1324). The reality of pain memory (and birth memory) is confirmed by a mother whose premature baby was shunted for hydrocephalus without painkillers and while paralyzed with curare. Large incisions were cut in his scalp, neck, and abdomen and a hole drilled in his skull. She writes that ten years after the operation her son will still not allow anyone to touch his head, neck, and abdomen in the areas touched during surgery. The mere sight of the hospital provokes in this child violent trembling, profuse sweating, screaming, struggling, and vomiting. Public outrage over these practices has since forced official associations of surgeons, anesthesiologists and pediatricians to commit themselves to more humane policies but many doctors remain unconvinced (Birth, March 1988, Roundtable, 36-41). They believe what they learned in anatomy, that the brain is only a fraction of its final weight and mass at birth and could not be working efficiently. As I have stated at greater length elsewhere (Chamberlain, 1988, pp. 9-13) the brain and nervous system can only be understood when they are connected to the endocrine system and the immune system; together they form one fluid intelligence system which begins to function early in gestation (Pert, Ruff, Weber, Herkenham, 1985). Further misunderstanding was created by the belief that "lower" and earlier brain structures were incapable of complex activity and could not work properly until the "higher" and later brain structures were fully developed. These beliefs also turn out, in retrospect, to be false (Prechtl, 1981). Doctors began finding out how babies reacted to pain by applying pinpricks and small electric shocks to the cheeks and legs of newborns, proving that they were indeed sensitive (Sherman & Sherman, 1925). A third of the babies in this study raised the opposite hand, protectively, to the place where pain had been inflicted. Numerous experiments were performed between 1925 and 1968 indicating sensitivity to pricks and scratches of the arms, legs, toes, calves, and even the face (investigators pronounced that the face was consistently more sensitive than the leg). An ambitious study of babies over a period of years at Columbia University by Myrtle McGraw (1941) concluded that newborns react to pinpricks with "diffuse" body movements indicating a lack of sensitivity. This interpretation was misleading because the babies did cry and withdraw their limbs; nevertheless the idea was widely embraced and had great influence. Skepticism about infant pain may be put to rest by a recent comprehensive review of pain and its effects on the prenat and newborn by Anand and Hickey (1987) of Harvard Medical School. From 200 citations in the literature, these doctors specify the anatomical pathways and mechanisms for pain perception from the seventh week after conception onward. They point to the early origins of the neurochemical systems associated with pain, especially substance P, which appears in the brain and spinal column at 12 to 16 weeks. Endorphins, the body's opiates for stress, are present in the fetal pituitary before 15 weeks. (A study by Facchinetti et al. in 1987, found these substances starting in the seventh week of pregnancy.) For those who believe that these opiates are sufficient for pain at birth, these anesthesiologists emphasize that for effective anesthesia it would take thousands of times more endorphin volume than the highest levels ever found in newborns. Anand and Hickey complete their review by noting the consistent and predictable effect of pain on the cardiorespiratory system, on hormonal and metabolic changes, motor responses, facial expressions, crying and other complex behaviors including longterm memory. CRYING IS COMMUNICATION After twenty-five years of investigation with acoustic technology, nothing is left of the old theory that baby cries are simple, random, undifferentiated sound. Lester and Boukydis (1985) review the many findings about the infant cry. Cries contain unexpected but eloquent information about illness, malnutrition, malformations, and other growth problems. Cries reveal hearing deficiencies, cries prove that a fetus has heard and learned some of its mother's speech characteristics about half way through gestation (Truby, 1965, 1975), and cries trumpet feelings in a measurable range from minimum to maximum distress (Papousek, Papousek, & Koesterer 1986). Prenatal Crying Oddly enough, audible crying begins long before birth at 40 weeks, the earliest recorded cries from aborted fetuses dating from

21, 22, and 23 weeks (Humphrey, 1978). This means that a baby is capable of crying about half the time it is in the womb. Cries have been heard coming from inside the womb. This condition, vagitus uterinus (literally, "squalling in the womb"), is rare but well-authenticated. Stories about such squalling have been passed down from ancient Egypt, Greece, and Rome. In 1923, an American physician, George Ryder, heard the sound of a baby crying after he had applied traction with forceps. Listening via stethoscope his assistant and nurses said the sounds were "high and squealing, much like the mew of a kitten." This moving event led to a world literature search and discovery of reports in many languages: 131 cases between 1546 and 1941, reported by 114 authors. Analysis of these records showed that crying was almost always associated with obstetrical procedures. About 20% of the crying prenatals had died-indicating the urgent nature of the cries (Ryder, 1943). Eight additional reports, published since 1941, leave no doubt about the pain being expressed and who or what was causing it: a hand entering the uterus to bring down a leg, applications of forceps, injections of analgesia, inserting a catheter, or rupturing the amniotic sac. In one account, a mother, two doctors, and three midwives heard a baby cry five different times over a twelve hour period before labor began (Blair, 1965); they described it as "a startling and awesome event." In three cases reported by a Belgian group (Thiery et al., 1973), one baby started crying after membranes were ruptured and the head was being displaced to drain fluid. Crying recurred six times at intervals of up to 20 seconds. She was delivered after a difficult vacuum extraction. The other two babies, presenting in breech position, began crying after rupture of membranes and when electrodes were being clipped to their bottoms. They continued to cry about six times during labor. Two of the three had initial Apgar scores of 3 and 6. (Strangely, these obstetricians concluded that crying is not a sign of fetal distress and has no adverse effect on the fetus.)

Perinatal Complaints Babies are famous for their cries at birth. Is crying normal? Some babies make no cry and instead gaze at their parents with total concentration. Have they no complaints? Babies cry when arriving in a delivery room twenty degrees colder than what they are used to in the womb. They cry being wiped and washed or being stretched out and measured. They complain when given injections (vitamin K) and eye drops (antibacterial). They react to skin puncture. Crying rates and heart rates shoot up as heels are lanced for blood samples (Owens & Todt, 1984). My client, Josh, apparently developed his phobia of hypodermic needles in the nursery. This is how he remembered it in hypnosis: I'm bothered by the nurse. She keeps coming in, taking my temperature, taking blood. I wish she would just leave me alone. The other thing that was annoying was the shot. That was more pain . . . I see the nurse leaning over me. She has a shot with something in it. She took the cap off it and checked it for air bubbles. She rubbed my left arm with alcohol and gave me a shot. It hurt! And I wasn't prepared for it. Then I became very tense and screamed. It really bothered me and I cried a long time after that. A different dimension of pain, the pain of separation and isolation, also provokes crying and is a common theme in birth memories. Studies tell us that newborns recognize their own recorded cry, showing self-awareness. Other studies show how perceptive they are of other cries. Babies cry with and apparently for one another (Sagi & Hoffman, 1976). They also discriminate between cries of babies their own age and cries of older babies, animal babies, and computersimulated cries. They are more likely to join the chorus of those their own age (Simner, 1971). Babies have different cries when bored or hungry. They cry after heel lancing (Grunau & Craig, 1987). Boston pediatrician Peter Wolff, noted for his continuous observations of newborns in their home environment, identified a "pain" cry and a "mad" cry (Wolff, 1969). In each home he conducted an experiment playing recordings of these cries and noting the mother's response time and attitude. He found a dramatic difference. To the pain cry mothers came in a rush, looking quite worried. To the mad cry, they came to check up but were not alarmed; they expressed tolerant amusement at this precocious expression of rage.

Circumcision Pain For thousands of years, pain has been inflicted on certain male newborns by circumcision rituals. The practice of removing the foreskin of the penis around the time of birth is more common in the West than in the East. Hindus do not do it, Moslems do. Jews must, Christians needn't. It has always been rare in China and Japan. In England the operation has now become rare. Worldwide, perhaps 15% of males are circumcised. In the United States the rate is about 60%.

Australia, which once had a rate as high as the United States, now circumcises less than 25%, thanks to an aggressive educational campaign by physicians (Davenport & Romberg, 1984). Western parents think little of circumcision unless they have actually seen it. A woman recently confided to me, "I couldn't look." Another said her boy began crying after circumcision and cried chronically for a whole year. But all infants are not alike; some seem far less disturbed than others. Some men carry conscious memories of circumcision. A medical professor wrote to me about his "confident recollection" of infant circumcision. He said he was aware of having a very sore penis with a collarlike fringe (probably from clamping) which was being cut off by his physician father at home. He recalls lying on his back on some green furniture, feeling no pain from the cutting but objecting strenuously! He was desperately wriggling body and limbs against constraint. He felt encroached upon and endangered though awed that something obviously belonging to him could be cut without the cutting itself hurting. He felt helpless and "squalled bitterly." For other infants circumcision is more upsetting than birth itself. A father told me his great surprise when the doctor proceeded to circumcise his baby at delivery. Quiet through the entire birth, this baby cried loudly during circumcision. A Jewish father, reflecting on his boy's circumcision on the eighth day, said it was one of the saddest occurrences of his babyhood and that he cried more that afternoon than anytime in his first year. For circumcision in hospitals, babies are strapped onto circumcision boards where they wait cold and frightened, the penis protruding through a hole in a sterile towel. Surgery with a clamping device begins by inserting a probe between the foreskin and glans. The probe is moved all around the glans to cut and loosen adhesions, a process called lysis. This is the maximum point of pain and crying. The foreskin does not naturally retract at birth and must be torn and cut back, leaving raw areas subject to urine burns and infection. After lysis, the foreskin is slit and the clamp applied, the skin pulled through and the excess cut away. Generations of obstetricians have done this operation, asking themselves if babies can really feel pain. French obstetrician Michel Odent comments that only men could originate such a cruel custom. Mothers left to themselves would be very unlikely to do such a thing to their own baby boys (Odent, 1986, p. 141). My client, Stewart, remembered his circumcision this way: There's a sensation I've never experienced before. It's in my back, being drawn up, pulled in. I don't know where I am but I feel like my shoulder blades are not resting comfortably and my shoulders are pushing down. I can't bend them. I'm on something hard and cold! I feel myself arching. It's cold! I feel my whole body arching now. I don't know what's going on. I hear babies crying and I'm crying too, I don't know why. Oh! They are pulling on my penis and I'm feeling some pain. It hurts there; I'm not sure why. There's a white robe; it's a doctor. They are holding my legs down, and my back is arched. They are cutting my penis and it hurts. It hurts! I feel my penis being pulled. I feel sharp points there. I'm hurting and my back is tight. Someone picks me up and holds me. I can't relax. I am stiff. My penis hurts; it burns. It hurts and I can't relax. Even when I'm bundled up I can't relax. It takes a long time to relax ... I'm tired now. I cried hard. I'm all cried out. I'm trying to go to sleep. In the last two decades, a dozen studies have reported infant reactions to circumcision. All reveal stress, manifest in the tripling and quadrupling of normal Cortisol levels in the bloodstream, changes in heart rate, the oxygen content of tissues, frequency of crying, disturbances of sleep, and inability of babies to calm themselves after being assaulted. In a definitive study of the types and degrees of crying during circumcision, psychologists and physicians at Washington University in St. Louis measured cries in exhaustive detail (Porter, Miller, & Marshall, 1986). They discovered that crying correlated with the invasiveness of the surgery. For the thirty babies in the study the frequency of cries shot up from 224 in the ten minutes before restraint, to 1,817 cries during the three minutes of lysis. There were almost as many cries in the following two minutes of clamping, pulling, and cutting. Detailed sound portraits (spectrograms) of cries at different stages of the operation were easily sorted into separate piles by strangers who did not know what they were looking at. The variation and urgency of cries was obvious to adult judges who were listening. The degree of urgency matched the stages of surgical invasiveness and unmistakably represented degrees of infant pain. Doctors still quarrel about the use of local anesthetic for circumcision, though research showing its safety and advantages has been available for a decade (Kirya & Werthmann, 1978;

Dixon, Snyder, Hove, & Bromberger, 1984). Doctors at the University of Iowa compared the stress level of thirty newborns with and without local anesthetic (Williamson & Williamson, 1983). Those done without anesthetic cried continually, nearly doubled their heart rates, and showed low oxygen tissue levels during the ten minute operation. In contrast, those given a few drops of anesthetic injected under the skin before cutting, reacted only briefly, and generally cooed, gurgled, and dozed through the procedure. One of the doctors, Marvel Williamson said, "The myth that newborns don't feel pain because their nerve pathways aren't yet developed just isn't true. They feel it and react to the pain." DOES BIRTH HAVE TO BE PAINFUL? Some psychologists think that all birth is a painful ordeal. They attribute pain to a "failing" placenta which becomes less effective as term approaches, crushing pressure on the head as it moves through the birth canal, and the finality of detachment from mother (Waddell, 1987). Indeed, expressions of birth pain do arise with distressing regularity in various forms of deep experiential psychotherapy (Grof, 1988; Janov, 1970). This primal pain, said to be repressed and unconscious, is not easy to reconcile with the peaceful expressions worn on some newborn faces. Frederick Leboyer, the famous French obstetrician, was one of the first of his profession to believe that babies were, in fact, in as much pain as they appeared to be. Tight-shut eyes, twitching eyebrows, howling and squirming, kicking, clenched fists, and quivering flesh were to Leboyer signs of agonizing distress (Leboyer, 1975). Influenced in these observations by his own recollections of birth pain, he proceeded to modify the birth environment. As he developed his method of birth without violence he watched the look of terror and stress disappear. Other evidence that birth need not be painful was gathered by obstetrics professor John Lind in Stockholm (Lind, 1978). He had seen thousands of births and could not believe that all babies were painfully born. To confirm this, he took photos of 130 normal full term babies and found in them few signs of pain or fear. Instead, many faces suggested curiosity and great expectation. Since then, reports of babies smiling after water birth have added to the impression that birth can be pleasurable. But this is not the usual birth. It is an irony that the medicalization of birth has made it more painful for babies. From labor onward, the (well developed) senses of a newborn are violated left and right. In hospitals, natural birth seldom survives the cascade of well-intentioned interference. Deliberate rupture of membranes will eliminate the hydraulic covering which protects the head; birth in the lithotomy position will nullify the effect of gravity and make progress difficult. As a consequence of interference, complications may be assessed with electrodes implanted in the scalp and blood samples taken by making a scalp wound. If chemicals have upset the normal processes of labor, the baby may have to be turned forcefully and removed by forceps. If these pains are missed, emergence into an air conditioned delivery room under bright light will be the first in a series of painful encounters: being roughly handled, wiped, measured and weighed; the sting of eye medication, the hurt of a vitamin injection and heel lance. Even a baby born quiet and contented must be provoked to cry in order to obtain a proper Apgar rating. Delivery room pains are usually followed by the pains of isolation and separation from parents. This exile may last for hours. If hungry, babies will have to wait; if they want to move or turn they cannot; if they want to hear or see their parents, it is impossible. Babies are taken from their parents in the name of health, to receive "the best of care." But the real risks of going to the nursery involve more than tears, as summarized by Brackbill, Rice, and Young, 1985 (Table 1.1, pp. 36-38). Premature and sick babies, the most vulnerable of all, are destined to endure the most pain. In a neonatal intensive care unit (NICU) they will face the many perils of trying to complete gestation in a man-made womb (Kellman, 1980; Lawson, Turkewitz, Piatt, & McCarton, 1985; Coolman, et al., 1985; Perlman & Volpe, 1983). A comprehensive review of the environmental stresses in neonatal intensive care has been made by Gottfried & Gaiter, 1985. Painful stimuli include incessant high levels of light and noise which may prove damaging in themselves (Glass, Avery, Subramanian, Keys, Sostek, & Friendly, 1985; Douek, Bannister, Dodson, Ashcroft & Humphries, 1976; Long, Lucey, & Phillip, 1980). Although these babies would naturally spend most of their time sleeping, rest is impossible here because infants may be disturbed as many as 132 times a day. Being turned over can be wrenching. Even lying on a mattress flattens the head. Pain is a way of life for infants in intensive care. Umbilical artery catheters and vein catheters are

routinely installed to provide permanent access for blood samples, pressure monitoring, and infusion of medications. Other catheters are installed for feeding. Tubes and machines facilitate breathing. All such procedures are subject to a host of complications with painful consequences. Even isopropyl alcohol used as a skin disinfectant prior to venipuncture or invasive procedures can cause 3rd degree burns in very immature infants (Peabody & Lewis, 1985). Infant pain is emotional and mental as well as physical. Harder to measure than exposure to light and cold, these pains show up commonly in birth memories of adults obtained in hypnosis. Impressed at a deep and unconscious level they manifest as depression, phobias, mistrust, and guilt feelings requiring psychotherapy years later (Cheek, 1975; Janov, 1983). Rejection of newborns for their facial features or sex, hostility toward them for causing pain and financial hardship, fears planted about their safety and well being can create their own kind of pain. Even verbal remarks delivered with emotional intensity may imprint deeply and cause repeated suffering (Chamberlain, 1988, chapter 10). An example is the mother who said to her doctor, "Why didn't you just wrap the umbilical cord around her neck and strangle her?" The daughter said she "hated her mother from Day One." Although it is difficult to explain infant comprehension of language, the painful effect of such remarks does frequently appear in hypnotic recollections of birth. The pathogenic consequences on the personality of the infant suggests the need for a new and higher level of antisepsis than the hand-washing which began with Phillip Semmelweis a century and a half ago. Judging from birth memories, both parents and professionals need to clean up their act. What can we do about newborn pain and suffering? Some pain may be part of a natural process that is beyond our control. If it is truly so, we should be alert to its coming and provide what comfort we can. Doing this will require letting go of the myth that babies do not feel pain. Some pain seems inevitable but is not. This is often revealed by women whose birth is "physiologic" or "natural": birth in a familiar environment, with constant support, freedom to move about, take whatever positions feel right, and make whatever sounds she wants. These freedoms seem to lower pain in both mother and infant. Familycentered birth in or out of hospital, including options for laboring in warm water and delivering in water further reduces both mother and infant trauma. We can read this on baby faces. We must not accept that baby pain at birth is inevitable. An especially heavy burden rests on professionals who make birth painful for newborns. Here we confront, not the pain of nature, but the pain created by science, obstetrics, and psychology. We are still enthralled by popular myths that babies don't feel, don't think, don't remember, and have no sense of self. The truth about newborn abilities, gleaned from scientific discovery in the last two decades, leaves us ripe for scandal-insisting on painful rituals that are inhumane and unnecessary. Here we confront the "cultural lag" between what we know and what we do. All painful procedures at birth should be reconsidered and peaceful alternatives pursued. How many more years of needless pain will newborns have to endure? The answer may depend on who takes the lead. Will obstetricians as a group conscientiously reinvent their approach to babies? Individual practitioners have already done so, but creating new standards for professional practice will take dedicated effort. That approach would affect the training of obstetricians as well as the practice of obstetricians, meaning improvements happening in many places at once. Parents themselves may be the ones to lead us into a new age of birth by setting new standards for how babies are treated. After all, whose babies are they? Parents always have the advantage of making the first move-as consumer they decide where to have their babies and what practitioners to employ. The current situation is a test of whether parents or professionals can react more quickly to new information.

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