

Physiological Effects of Neonatal Management

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Full Text: Headnote ABSTRACT: The resurgence of interest in the interrelationship and interdependence between the physiological and psychological aspects of being human (i.e. in wholistic health) and concern regarding attachment issues and dynamics also questions and bespeaks both of the quality of care given to newborns and the impact this care has on their ability to develop healthy attachments and personalities. This article addresses these issues in relation to how newborns are physically handled at birth and the impact that this has on their physical and psychological well being—most specifically, how the obstetrical and postpartal procedures affect the connective tissues which have been found through research to be not only physiological in substance but also psychological in nature. The upsurge of interest in a wholistic approach to life and health reflects an increasing concern about the interrelationship and interdependence between the physiological and psychological aspects of being human. This concern calls into question the quality of care given to the newborn. Expectant parents are demanding changes in both the labor and delivery environment and procedures, which not only take into account their needs but also the needs of the newborn. The work of Frederick Leboyer has challenged the traditional obstetrical procedures used in delivery and immediate postnatal management of the newborn. Klaus and Kennell's research has documented the sensory capacities of the newborn and their role in the attachment process between the newborn and primary caretaker.⁸ The dynamics of the sensory capacities and "cognitive" structure of the newborn have been further elucidated in "Factors in Neonatal Attachment, Part I: Newborns are People, Too!!"¹³ The findings of Harlow, Montagu, and Prescott have clarified both the relationship and significance of touch in attachment formation and later personality development. Also, the research of Caffey, Salter, and Guarneschelli has brought to light significant data in the area of child abuse which has ramifications in regards to some of the traditional modes of neonatal management. Research into the effects of Rolfing^b and the role and dynamics of connective tissue (also referred to as fascia) in the body has delineated important factors regarding the relationship between the physiological and psychological responses to experience. Hunt's recent research has given further information on the dynamics of the physiological and psychological interrelationship within a person. In view of this information, attention needs to be given to exploring the relationship of neonatal management to the newborn's ability to attach to the primary caretaker in an effective and healthy way. How is experience registered in the newborn? What is the link that unites the physiological and psychological factors of being a person? What is connective tissue, and how does it respond to touch and other stimuli? What is the significance of touch in attachment formation and personality development? How does this data relate to neonatal management? In exploring these issues it is important to note that newborns are totally sensory aware; they have all five sensory capacities fully developed and functioning at the time of birth.¹³⁻²⁴ Therefore, they take in the stimuli present in the birth environment. This data is processed on an emotional-physiological level since the newborn does not possess a rational cognitive structure for processing and communicating information. The way in which a newborn is responded to and handled during this time will determine the degree to which an infant is traumatically affected by the experience.¹³ NEONATAL MEMORY Memory is the ability to intellectually retain, recall, and reaccount past experiences, and to provide verbal data and description of specific past events. Because newborns do not have a developed complex vocabulary, they neither remember nor reaccount events in the way just described. However, they do have a memory process that functions on a nonverbal sensory (emotional and physiological) level. Researchers at McGill University in Montreal have found that memory exists 45 to 50 days after

conception.²⁶ Greenacre has discovered that newborns record cortically and thalamically their birth and postnatal experiences.¹⁵ Hunt has also verified that a person's physiological energy level responds to all stimuli and records it in the body, and that". . . memory of experiences are stored in body tissue . . . ," specifically, the connective tissue.²⁰ Newborns record their experiences physiologically and psychologically (emotionally) in their biophysical field.⁰ The connective tissue is the medium which indelibly records these experiences. Instead of being the memory storage bank, the brain has been found to function more as the lens of the camera does; it takes in the data to be recorded. The connective tissue serves as the film, registering the experience.²⁰

Role of Connective Tissue Connective tissue consists of sheets of interwoven fibers (like cheese cloth) that envelope every piece of our body in a hierarchical scale from the smallest piece (a muscle fiber) to the largest segment, covering the total body from head to toe in one complete body stocking. With the exception of bone, connective tissue is the strongest material in the body. It is resilient and has the ability to mold and conform to stress demands. It is a collagen substance, just as gelatin is, and therefore it can be molded and shaped into different forms. We see many different body shapes daily, from the "straight as a stick" person to the famous gnarled "hunchback of Notre Dame." The function of the connective tissue is to provide a protective form for the body to house its many parts; the skeleton provides a frame on which it hangs, and the muscles provide locomotion. When the body experiences stress (abrupt, sudden change) in any area, the connective tissue fibers emit a mucoprotein substance much like liquid glue to provide extra padding and protection for the traumatized area. It spreads throughout the interwoven fibers and glues the fibers and sheets of connective tissue to one another. The mucoprotein hardens and laminates the layers together. Physiologically, this hampers body functioning because circulation and nerve energy discharge is impaired. The blood and lymph vessels and nerve fibers run through the beds of connective tissue and are dependent on the connective tissue's flexibility for their flow. This reduction in circulatory flow and nerve energy discharge desensitizes the body. Psychologically, a person becomes emotionally desensitized and cognitively unaware in that area. Thus, they hold the experience in their biophysical field of being, both psychologically and physiologically. Since the muscles are housed in connective tissue sheaths, lamination of the tissue sheets impedes the function and balance of the muscles in their interdependent relationship and thereby causes misalignment of the body segments to one another. The skeletal structure's form and movement is affected by the muscle structure. Organs can be restricted in their functioning because they are not receiving the needed nutrients from the blood or energy discharge from the nerve fibers and cannot fully eliminate the toxins they are holding.

d The way in which a newborn is physically handled will determine whether or not the body's connective tissue will sustain sufficient trauma to precipitate the emission of mucoprotein from the fibers and result in circulatory imbalance and physiological problems.

EFFECTS OF INVERTING A NEWBORN The traditional practice of inverting a newborn (holding upside down by the ankles) is still accepted as common practice in neonatal management.⁶ Some delivery rooms use this procedure to drain mucous from the nasotracheal passages. Current hospital nursery protocols give this procedure as the acceptable way to measure a newborn. There are still childbirth education films showing as their finale the newborn being inverted at the time of birth. The magazine advertisement for Kimbie® diapers in 1976 proudly displayed the doctor inverting the newborn for mom, dad, attendants, and all to see!! Looking closely at newborns who are held in such a position, either in a film, ad, or real life situation, one does not see the face of a happy, relaxed, contented little person. Rather, the little person seen is in excruciating pain. The infant's body is taut, the face furrowed in rage and agony. This little person is being severely injured. The pelvic girdle is dislocated and the lumbar and cervical regions are whiplashed from being held in this position.^{6-7'16-43'44} There is evidence that the shoulder girdle is dislocated also. The practice of holding an infant upside down by the ankles has been defined as child abuse ^{6,7,16,43,44} r_)r j0hn Caffey, Pediatric Radiologist at Children's Hospital, Pittsburgh, Pennsylvania, a pioneer in the field of child abuse, has done extensive research into the whiplash-shaking syndrome which also addresses the effects of inverting young infants. He has concluded, "I think that almost everyone would agree now, that the newly born infant should be protected from

all kinds of traumatic stresses including inversion [author, italics] and 'shaking up and down'." [6] In an inverted position, the lightest parts of the newborn's body (the legs and neck) are expected to provide support for the heaviest (head and torso). The heaviest parts are in the gravitational position of pulling the body weight downward away from the current position of support and balance, the legs, which are being held by the physician or nurse. Instead of providing support, the legs are being pulled out of the pelvic girdle while the torso is being thrust by gravity down onto the neck which is not strong enough to support it. The head is pulled away from the neck by gravitational force. Newborns have been curled up in a fetal position for an extended period of time and still retain that position naturally after they are born. In this position, the planes of the back are wider and longer than the planes of the front of the body. When a newborn is inverted and held by the ankles, the fetal (concave) position abruptly becomes an arched (convex) position, with the front suddenly having more expansion and length than the back. Body parts and tissue are forced into positions they are not prepared to assume in order to support the new tension and weight distribution and compensate for the change and stress incurred. The connective tissue responds immediately to the new stress and balance demands in order to add strength and protection to the traumatized area. Effects of Other Procedures There are other procedures used in neonatal management which are also injurious to a newborn. The more reflex examination and several traditional neurokinetic tests included in the new Brazelton examination also whiplash the lumbar region of the body. The lumbar region houses the lumbar plexus, a major locus of nerve fibers outside the spinal cord. The whiplash reverberates throughout the whole spinal column and affects the other plexi. The lumbar plexus is nestled in the connective tissue on the posterior side of the psoas, an internal muscle that connects the upper part of the body to the lower-(diaphragm to thigh). It is the central locus and balance for the body structure.⁴² When the lumbar region is whiplashed, the connective tissue becomes laminated, thus cutting off the circulation and nerve energy discharge to the region. The psoas is restricted in its movement and its important balancing function is greatly reduced. The rest of the body is affected by this trauma and the resulting physiological response, and this has to make changes in order to compensate for the lack of functioning in this area. Residual effects of the trauma remain throughout the person's biophysical field, both physiologically and psychologically. Chronic muscle problems result from the "lack of stabilization of the anterior hip muscles, the iliopsoas. This condition statically lacks pelvic excursion (flexibility and movement) limiting free movement at the hip joint, inevitably leading to back strain, pain, and frequently to sciatica and compression herniation of the spinal discs. The deep muscles close to the center of the body, which includes the psoas, are the areas where memory of the past traumatic experiences seem to be held, where splinting against pain takes place, and where bodies become misaligned . . ." ^{20, 66,93} Connective tissue fibers have very similar properties to DNA, which is known to be a genetic memory bank. Dr. James Osham, Ph.D., Cellular Biologist with the Marine Biology Laboratory in Cape Cod, Maine, has found that there appears to be change in the structure of connective tissue fibers found immediately around capillary cells when there is external pressure applied to the connective tissue³⁶. This process corresponds with Hunt's description of people re-experiencing past traumas during the Rolfing process, and her conclusion that memory is stored in the deep tissue of the body, the connective tissue.²⁰ TOUCH AS A CRITICAL SENSORY MODALITY The memory function and responsiveness to touching and handling which connective tissue possesses has significant ramification in the handling and management of newborns. The most critical sensory modality involved in the attachment process is that of touch and tactile stimulation/movement. When this modality is lacking in the newborn and infant's experience, the potential for the development of an unstable and violent personality is very high³⁸. Babies deprived of tactile stimulation, or pleasurable touching, will exhibit varying degrees of catatonic symptoms—they become rigid when touched, will pull away, and protestingly cry when touched and/or held.^f Occasionally, they will become overly demanding for attention and affection when they are older in order to satisfy their early unmet need for touching and affection. As grownups, however, the usual response to touch is aggressive defensiveness and/or violence. Such persons also lack physical awareness of their own body size, shape, parts and spatial relationship, and

have problems with their own self-identity, individuality and self-esteem. Touching is essential for survival as well as attachment. During World War II, infants died in European orphanages in large numbers. The research of Spitz,^{45,46-47} Bowlby³⁻⁴ and Anna Freud^{11,12} showed that these infants died of tactile deprivation. All of their physical needs had been met: they were fed, diapered, and kept clean and warm. However, they were not held and stroked. A newborn's primary task is to re-establish biorhythmic balanced Consistency in caretaking and tactile stimulation (touching) is important in order for this balance to be restored. The availability and proximity of the primary caretaker is critically essential for providing consistent patterns of tactile stimulation.

RECOMMENDATIONS In light of this data, several factors need to be considered in the management of the newborn in order to minimize physiological and psychological trauma and tactile deprivation and insure a healthy attachment to the primary caretaker. The role of connective tissue in responding to trauma and storing memories emphasizes the necessity for medical attendants to handle newborns gently during delivery and the postnatal period. The newborn needs to be supported at the pelvic and neck-shoulder area and allowed to remain in a fetal position and "unfold" in the infant's own timing. When a newborn is allowed to remain in a fetal position until ready to expand and stretch out the body, the connective tissue will respond cooperatively without the traumatic consequences previously described. Children who have been born and responded to in a gentle, nurturing manner and allowed to stretch out their body and adjust to the environment at their own rate have been described as happy, secure, spontaneous, curious and easy-going little people, possessing a "joi de vivre" not found in other children.^{1,5,10,27,40} "They seem to be reaching out instead of protecting themselves."⁵ Klaus and Kennell have found in their research that during the first hour after birth, the newborn is in a "quiet alert" phase, actively taking in the stimuli from the environment.²⁴ The newborn needs to be placed on the mother's abdomen to re-establish physical contact. Wrapping the newborn and mother together in a blanket will provide warmth. Flesh to flesh contact is very important during this initial adjustment phase, because it puts the newborn in contact with familiar intrauterine sounds and stimuli which will aid in the re-establishment of the infant's biorhythmic balance. The immediate-assessment examination of the newborn should be done with the infant on the mother's chest or abdomen. Any testing, medication and measurement that can be postponed, such as the eye drops, etc., should be done after the first hour, during the down phase when the newborn is going to sleep. Good nasotracheal drainage can be obtained without inverting the newborn. Doctors Klot and Lilling have found that the drainage has been good in newborns without suctioning when the newborn was laid prone across the mother's abdomen.²⁵ Measuring for accurate birth length can be done directly on a measuring board or with the board beside the infant. The body needs to be extended gently to lengthen the legs out of the pelvis and lay the head and torso flat. Gentle extension will minimize trauma to the connective tissue. Interruption of contact and proximity to the primary caretaker (mother), such as for weighing and measuring, needs to be minimal and brief. Bowlby's work has pointed out very clearly that proximity and availability of the primary caretaker is the essential factor in providing the needed touch/tactile stimulation. Twenty-four hour rooming-in, when there is a hospital stay, provides this opportunity. The primary caretaker needs to provide care to the newborn for all needs. These recommendations for newborn management are oriented to normal postnatal experiences where neither mother nor newborn is at high risk. Management of ill or premature newborns will be discussed in a future article.

SUMMARY Professionals and parents need to consider these factors in neonatal management: 1. The newborn has all his/her senses functioning at birth. 2. The newborn takes in all stimuli in the environment indiscriminantly and responds to it emotionally and physiologically. 3. The connective tissue is sensitive tissue and responds to stress and trauma to provide protection and support to the body. 4. Memory is stored in the connective tissue through the stress response process. 5. Connective tissue health and tone affects the total physiological and emotional health of a person. 6. In order to protect the newborn from dislocation and whiplash injuries, the newborn should not be inverted, and the pelvic and head-neck region need to be supported when the newborn is held. Newborns need to stretch and extend their body in their own timing. 7. Good nasotracheal drainage can be obtained without inverting the newborn. Accurate

measurement can be obtained by laying the newborn on or next to a measuring board and gently extending his/her limbs, head, and torso. 8. Touching is essential for attachment formation. The degree and way a newborn is touched and handled will affect personality development. Frequent, pleasurable touching will develop a secure, confident, and contented personality. People are the sum total of their life experiences because experiences are registered in the body. The postnatal period is a most significant time during which the infant forms a foundation for personality development. Footnote a Primary caretaker refers to the mother, father, or other person involved in administering the primary care to the newborn for an extended period of time. b Rolfing is a body manipulation and education technique that works with the connective tissue in order to align the body within itself on horizontal, vertical, and coronal planes. It is based on the fact that the body is a "plastic" medium (can be bent into unusual and extreme positions without breaking), and responds to life experiences in its structural development. Often the body loses its vertical balance and the different parts become misaligned/malaligned with one another, and physiological and psychological health is affected by this. c Biophysical field refers to the dynamics of the electro-magnetic energy field occurring in the body on a cellular level, as well as the gross anatomical and physiological processes occurring in the body. d Personal communication with R. Louis Schultz, Ph.D., Anatomist and Physiologist, regarding the structure and function of connective tissue. He is also Chairman of the Education Committee of the Rolf Institute, Boulder, Colorado. e Neonatal management refers to the way in which a newborn is physically handled and cared for during the first 30 days of life. f Mothers have despairingly and frustratingly told me how their babies will protestingly cry, become rigid, and lunge away from them when being held. Upon inquiry, I am told that there was very minimal physical contact-a brief period for feeding only-during the hospital stay. In the initial hours after birth, the newborn was in the nursery while mother was in the recovery room, where she remained except for feedings. g Biorhythmic balance refers to the heart and respiratory rate, blood chemistry level, metabolic process, eating, and sleep/wake patterns, and body tension/relaxation tones functioning harmoniously within their own cycle and with one another. References REFERENCE NOTES 1. Baronberg J: The joy and excitement of a gentle birth. Rocky Mountain News. Denver, Colorado. Wednesday, January 28, 1976. 2. Baumgarten B: Relating to infants necessitates that you listen to their cues. Boulder Daily Camera, Boulder, Colorado. Friday, Feb. 17, 1978. 3. Bowlby J: Attachment. New York; Basic Books, Inc. 1973. 4. ____: Separation: Anxiety and Anger. New York: Basic Books, Inc. 1973. 5. Braun J: The struggle for acceptance of a new birth technique. Parade Mag., 17-19, Nov. 23, 1975. 6. Caffey J: Personal communication. Children's Hospital, Pittsburgh, Pennsylvania 1975. 7. ____: The whiplash shaken infant syndrome. *Pediatr* 54 :4 Oct 1974. 8. Collins C: On the dangers of shaking young children. *Child Welfare* 53 (3):365 March 1974. 9. Coulter DJ: Right brain phenomena. Paper presented at the Mountain States Transactional Analysis Conference, April 16, 1977. 10. Faber N, Novak R: Birth is anguish for the baby, Dr. Leboyer insists, and he offers some radical remedies. *People Weekly* 5 (8):43-46 March 1, 1976. 11. Freud A: Normality and pathology in childhood: Assessments of development. London: Anghar, International Universities Press, 1966. 12. ____: Some remarks on infant observation. *Psychoanalytic Study Child* 8 :9-19 1953. 13. Garland KR: Factors in neonatal attachment: Part I-Newborns are people too! *Keep Abreast J Human Nurturing* 3 (3):206 July-Sept 1978. 14. Gray's anatomy, 35th edition. Eds. Warwick and Williams. New York: WB Saunders Co 1973. 15. Greenacre P: Trauma, growth, and personality. New York: International Univ Press 1959. 16. Guarnaschelli J, Lee J, Pitts F: Fallen Fontanelli. *JAMA* 222(12): 1545-1546 December 18 1972. 17. Harlow HF: The nature of love. *American Psychology* 13:673-85 1958. 18. ____: The development of affectional patterns in infant monkeys. *Determinants of Infant Behavior*, Ed. BM Foss, Vol I. New York: John Wiley and Sons 1961. 19. ____, et al: The affectional systems: Behavior of nonhuman primates. Vol 2 New York: Academic Press 1965. 20. Hunt VV, et al: A study of structural integration from neuromuscular, energy field and emotional approaches. UCLA Department of Kinesiology Electromyographic Laboratory. Sponsored by the Rolf Institute of Structural Integration, Boulder, Colorado 1977. 21. Johnson D: The protean body. New York: Harper & Row 1977. 22. Kapra F: The too of physics. New York: Bantam Books

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