

## How to Maximize Human Potential at Birth

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**Abstract:** None available.

**Full Text:** Headnote ABSTRACT: Building on a successful program of prenatal stimulation previously reported, obstetrical routines were altered to provide more continuity with the womb environment. The paper reports both the rationale and specific procedures employed. The goal of the program was to treat the newborn as a person, minimize discomfort during birth and avoid conditions of possible stress and anxiety. Gentle stimulation included eye-to-eye contact, smiles, skin-to-skin touch, soothing voices, early breastfeeding, and enjoyable relations between mother, father, and child. Ultrasound images and other medical technologies, as well as careful observations of very premature infants who survive early delivery, let us know about the secret life of the unborn child: the capacities of seeing, feeling, hearing, tasting, moving, touching, and even learning in utero. The fetus can receive and respond to outside stimuli and is considerably more sophisticated, more alive, and sensitive than we previously believed. To consider how to maximize human potential at birth, we first compare the environment provided in the womb with the environment we provide at birth. Inside the womb, fetuses can hear the mother's body noises at 72 decibels, feel warmth, and gain familiarity with her heartbeat and voice. At birth, they hear screaming from the mother, phones ringing at the nurse's station, the bleep, bleep of the fetal monitor, shouting sounds like "push, push!" or the noisy conversation of the health team. These delivery room surroundings are noisy and inappropriate. A baby's birth under these circumstances is like bringing an individual from a rural area to the center of New York City with all its traffic and machinery. Because newborns can see, hear, and feel they must find this environment stressful and upsetting. In utero, the fetus has been exposed to the dim light that passes through the mother's uterine wall. This stimulates the visual sense and develops the day/night cycle. In the delivery room, there is very bright, full power light as soon as the head passes through the birth canal. In the womb, the temperature is always slightly higher than the mother's body (Walker, et al. 1969) but at birth, babies emerge soaking wet into a room about 25 degrees colder. Babies chill because surface areas lose heat and because there is only a thin layer of thermal insulation from fat and skin. Newborns are simply unable to control their temperature in this environment. In the liquid environment of the womb babies develop muscle tone by rotating, moving arms and legs, turning, bending the body, head, and back (Graves, 1980). In later months womb space is cramped and movement restricted. All that changes at birth with the challenge of space and gravity. Being too open or too tight can provide fear and anxiety. Inside the womb, babies swallow amniotic fluid regularly and frequently bring hand to mouth to suck and taste (Bradley & Mistretta, 1975) but in the outside world it is harder to bring hand to mouth. Once babies emerge from the birth canal, their universe changes radically. They may feel pain from the squeezing of the uterus and from the massive massage of the body coming through the canal, plus a vigorous pat by the birth attendant. In the womb, within the amniotic sac, the pre-nate received only gentle touch from the inner wall of the uterus. A new experience immediately after birth is the suction bulb which enters the mouth and nose. Instead of warm water, air surrounds the newborn which may contain bad odors from vaporous drugs and antiseptics which irritate the sense of smell. The most extreme change is in the source of oxygen, which came easily from the placenta and cord but must now come from the infant's own lungs. The lungs require a few minutes to begin functioning with regularity. For this critical period, nature has provided a fail-safe mechanism. The placenta holds about 30% of the infant's blood and oxygen supply in reserve for the transition. Nevertheless, as soon as babies arrive from the inside world, they face the challenge of breathing through the lungs. In the delivery room, newborns will also experience rapid motion for the first time, be poked, prodded, and pushed. Joints are stretched being picked up,

set down, and otherwise jolted about. We should recognize that the newborn person may find all this new activity stressful and threatening to the sense of well being. Moreover, the depressant effect of medications during labor may have deleterious consequences far beyond the perinatal period. A Cambridge University study revealed that babies whose mothers were given narcotics during labor were sleepier and more sluggish at sucking. Brackbill & Broman (1979) found that children of women who received large doses of drugs were slower in development of motor and cognitive skills. Some deficits in development persisted for four to seven years. Narcotics used during labor suppress the natural rise of endorphins in the fetus; it is possible that this practice also affects endorphin response during stress in later life (Thomas, et al. 1982). Passage through the birth canal may itself prove to be traumatic with the use of forceps or vacuum extraction and the possibility of intracranial hemorrhage. In summary, modern delivery contains a variety of stressful events: profound pressures in the birth canal, forcible rotation of the head on the neck while traversing the maternal pelvis, the first breath of air, extension of the spine, and other vigorous stimulations for which the newborn is not yet adapted. How can we welcome the newborn with the least trauma and stress so there will be no impairment at birth? How can we minimize discomfort and let newborns enjoy a totally friendly experience with mother and the new environment? To maximize the human potential at birth, we have developed the following program at the Hua Chiew General Hospital in Bangkok.

I. UTERINE ACTIVITIES THAT PREPARE FOR BIRTH

1. Cold water. To prepare the fetus for the temperature adjustments necessary at birth we place a cold water bottle briefly on the mother's abdomen in the direction of the fetus' back. We think this helps the fetus anticipate the experience of coldness at birth.
2. Gently squeezing the abdomen. Compared to the warmth and security of the womb, the day of birth comes like an earthquake as the inner wall of the uterus (previously soft and gentle) becomes angry and squeezes in contractions. These can give the baby fear and anxiety. We have applied gentle squeezing to the maternal abdomen in the last two months of pregnancy in order to familiarize the baby with contractions. In the last month of pregnancy, the increase of Braxton Hicks contractions also prepare the baby for the stronger contractions of true labor.
3. Rhythmic patting and effleurage. In gentle births, some newborns breathe spontaneously, do not cry, and begin life with soft, cooing vocalizations (Oliver & Oliver, 1978). Most medical personnel, however, believe it is necessary for newborns to cry, so they vigorously pat the newborn bottom. Therefore, we pat the prenatals' bottom rhythmically to prepare for this experience without fright. Patting after birth can also be used to soothe the newborn. We also recommend simple effleurage on the mother's abdomen to reinforce positive feelings and establish a familiar pattern of touch to the baby.
4. Rocking. To prepare for the movements through space which occur at birth, we encourage use of rocking chairs with the unborn. We think this improves motor tone and balance and prepares for the rapid motions which will happen at birth.
5. Prenatal audiotapes of mother's voice. We recommend that parents prepare a 15-minute audiocassette to include music and the mother's voice, and play it once a day to facilitate mother-infant attachment. The same familiar tape can be used to welcome the newborn after birth.
6. Using a flashlight. We encourage mothers to shine a flash-light periodically on the lower abdomen near the location of the fetal eye. We think this stimulates fetal vision in a gentle way and prepares the unborn child for the lights which will be encountered at birth.
7. The Kick Game. We use the exercise suggested by Van de Carr (1988) in which the mother pats her abdomen every time she feels the fetus move, until the fetus becomes conditioned to move in response to her patting. We think this helps the fetus learn to respond to outside stimuli. We also think that the kicking game improves muscle tone and develops the muscles which later help the fetus push through the birth canal to be born. In these seven ways we help to prepare the fetus for birth.

II. MAKING THE BIRTH ENVIRONMENT MORE WOMB-LIKE

Just as animals look for a safe, private place for birth, the ideal place for human birth is also a warm, calm, quiet, and comfortable place where both mother and baby can relax. Therefore, the air conditioning, intended for the comfort of those who are gowned and gloved, should be switched off before the baby arrives.

1. Low lighting. Bright lights should certainly be dimmed so that the newborn will not have a problem exploring faces, especially those of the family. Low lighting may contribute to calm, relaxed feelings and therefore improve blood

circulation. 2. Sounds. Sound levels of equipment should be kept down. The heart sound of the mother, made so familiar in utero, should be featured also at delivery (Salk, 1960). This sound is reassuring and helps to calm and comfort the newborn. 3. Soft touch and voices. Like other mammals, human babies need proper touching at birth by their mothers. Many experiments with animals illustrate the damage of separating babies from their mothers at birth, even for short periods of time (Klaus & Kennell, 1982; Carter-Jessop, 1981). Human studies have shown the damaging effects of early deprivation from holding, looking, and stroking (Lumley, 1980; Bowlby, 1982). Therefore, we recommend embracing newborns immediately after birth and stroking them gently in the same way as practiced in utero, accompanied by soft talking. 4. Warm bath. We support the practice of Frederick Leboyer (1984) to provide a warm water bath to the baby shortly after birth. This directly recapitulates the enjoyment of the watery environment of the womb and gives the newborn time to become adjusted to the new atmosphere of air. 5. Supportive movement and activity. As the newborn confronts the difficulty of moving outside of the fluid environment of the womb, we help with arm, finger, and hand to mouth movements. We wrap babies loosely to allow free movement of arms and legs, as in the early womb days. We lay babies on the mother's abdomen to reconnect with the familiar feelings and sounds heard from inside the womb. 6. Breastfeeding. In utero, the fetus sucks fingers and toes and amniotic fluids, developing the muscles and bones which will be used for suckling and tasting as an infant. This suckling activity is spontaneous and naturally soothing. It is also healthful, social, and personal, laying a foundation for all intimate relationships of the future. These are six ways we try to make the birth experience more womb-like for the baby.

III. SUPPORT FOR MOTHER AND NEWBORN To provide optimal care of the newborn, optimal care must be given to the mother. Medical support should be conservative during the intrapartum period to avoid trauma or injury, reserving anesthetics and surgical interventions only for emergencies.

1. Fathers are welcome. Some research suggests that early father involvement in pregnancy has a positive influence on the child's later social and cognitive development (Peterson, et al. 1979). His presence during labor and delivery is associated with fewer complications and easier postpartum adjustment (Bloch & Bloch, 1975). The father's participation establishes closer ties between father and baby and confers significant long-term advantages upon the child (Nicholson et al. 1983). At birth, father can give his soothing voice, caring smile, and physical and emotional support during contractions. His soft touch in massage sets the tone for future relations with the child.

2. Positive stimulation. To stimulate the flow of endorphins, we suggest that mothers bring to the labor room a picture of a beautiful baby face to look at while listening to light or classical music. We find that these help mothers to relax and reduces both anxiety and the need for pain medication. We also teach relaxation and visualization techniques to reduce fear and create a positive view of birth. We encourage mothers to change to more comfortable positions through labor. We believe that visualizations can help to connect the mother to the unborn child (Cranley, 1981).

3. Personal attention and care. Mothers tour the hospital labor and delivery areas in advance to feel more familiar and confident about the birth environment. During labor, we provide continuous one-on-one nursing care, which is known to shorten labor and reduce complications (Sosa et al. 1980). The attendant helps mothers to focus on techniques they have previously learned, keeps in physical contact, can do back massage, offer ice chips, and wash with cold cloths. We teach affirmations to maintain a positive state of mind, overcome negative thoughts, and strengthen confidence. We encourage parents to talk to the unborn baby as a way of soothing and giving the baby a feeling of security.

4. Medical restraint. To diminish fetal discomfort during the birth, the umbilical cord is cut at the optimal time, after the lungs have had a chance to function with sufficient regularity. Recent research on time of cord clamping has dispelled fears that late clamping will cause an oversupply of blood and lead to hyperbilirubinemia (Williams Obstetrics, 1980). To facilitate breathing through nose and lungs, gentle suction is provided in three steps, first when the head emerges from the birth canal; secondly, when the chest has passed through, and lastly, when the baby is laid on the mother's abdomen.

IV. OUR NEONATAL STIMULATION PROGRAM Just as we have sought to maximize infant potential in the prenatal period (Panthuraamphorn, 1991, 1993) we continue with stimulation techniques in the neonatal period. Our goal is to

provide a stimulating environment for all the senses. 1. Tactile stimulation. We believe that touch gives babies a sense of emotional security, facilitates normal growth and development and strengthens the relationship of baby with the parents. Cross-cultural studies reveal that low-touch societies have a higher incidence of aggressive behavior (Prescott, 1983). Psychological studies also show that touch deprivation can lead to severe physical and emotional consequences (Bowlby, 1982). An experiment at Duke University in 1951, found that mothers rooming-in with newborns and engaging in touch stimulation had less problems caring for their children later (McBryde, 1951; Greenberg et al. 1973). Therefore, we encourage mothers to hold, stroke, and pat their babies immediately after birth. 2. Auditory stimulation. Because sounds are much more moderate inside the womb, we take care to moderate the sounds in the delivery room. Especially important is the mother's heart sound which the baby can hear when held to the breast, and of course, the mother's voice. We also suggest playing the prenatal tape which contains voices and music the baby has heard before birth. We hope these sounds give the baby a feeling of security and familiarity. 3. Visual stimulation. We notice that newborns arrive with visual curiosity and appreciate eye-to-eye contact, especially with the smiling faces of their mothers and fathers. Research in Sweden indicates the many ways that babies and their mothers benefit from contact in the time immediately following birth when the baby is very alert (DeChateau, 1977; 1988). 4. Stimulation of taste and smell. Early breastfeeding provides immediate stimulation of the gustatory sense, which has been active since early in gestation, and also the olfactory sense, which is a new sense experience after birth. Breastfeeding also stimulates the release of oxytocin in the mother which is useful in returning the uterus to its normal size and decreases the possibility of postpartum hemorrhage (Newton et al. 1968; Keverne, 1988; Argiolas & Gessa, 1991). UNICEF and the World Health Organization have initiated the "Baby-Friendly Hospital" program which includes early breastfeeding and mother-infant contact at delivery. Some studies indicate that preterm babies who are breast-fed achieve higher intelligence scores than bottle-fed children (Lucas, et al. 1992). We are also interested in the role of the hormone pro-lactin, stimulated in breastfeeding, in facilitating maternal feelings of affection and attachment to the baby. The earlier breastfeeding starts, the greater the benefits seem to be.

AN EXAMPLE FROM OUR PROGRAM A typical result from our combined program of prenatal enrichment (Panthuraamphorn, 1991) and enrichment at birth is a 24-year old first mother and her son. The newborn weighed 3,520 grams, was 50 cm in length, and had a head circumference of 34.5 cm. The Apgar score was 9 in the first minute after birth and 10 at five minutes (perfect). The baby responded immediately to his mother's voice. On the second day, he could raise his head up 90 degrees, turn to voice, and follow an object past the midline. This healthy baby cried little and responded well to hearing the song sung by his mother in utero. Her baby showed good physical and emotional growth and rapid progress in social, language, and motor skills. We do not believe these results are due to the enriched environment at birth alone, since this time was very brief. It is more likely that these good results are due to the combined program of prenatal and intrapartum enrichment. We believe we provided a way for maximizing human potential by treating the newborn as a real person.

CONCLUSION In order to raise an intelligent infant, attention must be given to adequate stimulation in the prenatal period (Panthuraamphorn, 1993) and thoughtful stimulation during the intrapartum period. The interventions we provided around the time of birth were focused on treating the newborn as a human being, minimizing discomfort during birth, and avoiding conditions of possible stress and anxiety. Our goal was to offer gentle stimulation, eye-to-eye contact, smiles, skin-to-skin touch, soothing voices, early breastfeeding, and enjoyable relations between mother and child. We have been rewarded by positive outcomes for parents and babies. Our next goal is to establish further enrichment methods for developing bright and happy children.

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Editor's Note: Thanks are also due to Dr. David Chamberlain who graciously edited Dr. Panthuraamphorn's

paper. References REFERENCES Argiolas, A. &Gessa, G. L. (1991). Central functions of oxytocin. *Neuroscience &Biobehavior Review* 15, 217-231. Block, C. &Block, R. (1975). Effect of support of the husband and obstetrician on pain and probability of medication during labor and birth. *Birth &the Family Journal*, 2, 43-50. Bowlby, J. (1982). Attachment and loss: Retrospect and prospect. *Amer. J. Orthopsychiatry* 52(4), 664-678. Brackbill, Y. &Broman, S. (1979). Birthing drugs and babies. *Science News* 115(3), 40. Bradley, R. M. &Mistretta, C. M. (1975). Fetal sensory receptors. *Physiological Review* 55, 352-382. Bruck (1961). Temperature regulation in the newborn infant. *Biologia Neonatorum* 3, 65-119. Carter-Jessop, L. (1981). Promoting maternal attachment through parental intervention. *Amer. J. Maternal &Child Nursing* 6(2), 107-112. Cranley, M. S. (1981). Roots of attachment: The relationship of parents with their unborn. *Birth Defects* 77(6), 59-83. DeChateau, P. &Wiberg, B. (1977). Long-term effect on mother-infant behavior of extra contact during the first hour postpartum. I. First observations at 36 hours. II. A follow-up at three months. *Acta Paediatrica Scandinavica* 66, 137-145. DeChateau, P. (1988). The interaction between the infant and the environment: The importance of mother-child contact after delivery. *Acta Paediatrica Scandinavica*, Supplement 344, Vol. 17, 21-30. Graves, P. L. (1980). The functioning fetus. In Greenspan, S. I. and Pollock, G. H. (Eds.), *The course of life: Psychoanalytic contributions toward understanding personality development*. Vol. I, *Infancy and Early Childhood*, 253-256. Washington D.C.: National Institutes of Mental Health. Greenberg, M., Rosenberg, I. &Lund, J. (1973). First mothers rooming-in with their newborns: Its impact on the mother. *Amer. J. Orthopsychiatry* 45(5), 783-788. Keverne, E. B. (1988). Central mechanisms underlying the neural and neuroendocrine determinants of maternal behavior. *Psychoneuroendocrinology* 13, 127-141. Klaus, M. H. &Kennell, J. H. (1982). *Maternal-infant bonding*. 2nd. ed. St. Louis, MO: Mosby. Leboyer, F. (1984). *Birth without violence*. New York: Knopf. Lucas, A., Morley, R., Cole, T. J., Lister, G. and Leeson-Payne, C. (1992). Breast milk and subsequent intelligence quotient in children born preterm. *Lancet* 339, 261-264. Lumley, J. (1980). The image of the fetus in the first trimester. *Birth &the Family Journal* 7(1), 5-14. McBryde, A. (1951). Compulsory rooming-in in the ward and private newborn service at Duke Hospital. *J. Amer. Medical Assoc* 145, 625-628. Newton, N., Peeler, D. &Rawlins, C. (1968). Effect of lactation on maternal behavior in mice with comparative data on humans. *J. Reproductive Medicine* 1, 257-262. Nicholson, J., Gist, N. F., Klein, R. P. &Standley, K (1983). Outcome of father involvement in pregnancy and birth. *Birth* 10(1), 5-9. Oliver, C. M. &Oliver, G. M. (1978). Gentle birth: It's safety and its effect on neonatal behavior. *J. Ob/Gyn Nursing* 7(5), 35-40. Panthuraamphorn, C. (1991). The effects of a designed prenatal enrichment program on growth and development of children. Paper presented at the 5th International Congress on Pre- &Perinatal Psychology, Atlanta, Georgia. Panthuraamphorn, C. (1993). Prenatal infant stimulation program. In Blum, T. (Ed.), *Prenatal perception, learning, and bonding*, 187-220. Hong Kong: Leonardo. Peterson, G. H., Mehl, L. &Leiderman, H. (1979). The role of some birth-related variables in father attachment. *Amer. J. Orthopsychiatry* 49(2), 330-338. Prescott, J. W. (1983). Developmental origins of violence: Psychobiological, cross-cultural and religious perspectives. Invited Address, American Psychiatric Association, 136th Annual Meeting, New York, May 1983. Salk, L. (1960). The effects of normal heart beat sound on the behavior of the newborn infant: Implications for mental health. *World Mental Health* 2, 168-175. Sosa, R., Kennell, J., Klaus, M., Robertson, S. (1980). The effect of a supportive companion on perinatal problems, length of labor, and mother-infant interaction. *New England J. Med.* 303, 597-600. Thomas, F. A. (1982). Influence of medication, pain, and progress in labor on plasma beta-endorphin-like immunoreactivity. *Brit. J. Anesthesia* 54, 401-408. Van de Carr, R. (1988). Prenatal University: Commitment to fetal-family bonding and the strengthening of the family unit as an educational institution. *Pre- &Perinatal Psychology Journal* 3(2), 87-102. Walker, D., Walker, A. and Wood, C. (1969). Temperature of the human fetus. *J. Ob/Gyn British Commonwealth* 76, 503-511. Williams Obstetrics (1980). Pritchard, J. A. &MacDonald, P. C., (Eds.) (16th ed.). New York: Appleton Century Crofts. AuthorAffiliation Chairat Panthuraamphorn, M.D. AuthorAffiliation Chairat Panthuraamphorn, M.D. is the Chief of the Medical Conference Committee of the Hua Chiew General Hospital Bangkok, Thailand. He is a member of the APPAHA

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