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Chapter 2

Neonatal Care in the First Hour of Life

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Additional information is available at the end of the chapter

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Abstract

The very first hour in a baby's life can have a significant—lifelong—impact on the health of the baby and on the bond between the mother and a baby. Keeping mothers and babies together is a safe and healthy birth practice. Childbirth and the first hour after birth is a time of many changes for both mother and child. Changes are also physiological, as well as psychological. Creating an optimal environment for birth boosts the right hormones for natural birth, which reduces the need for interventions that could cause early mother-baby separation. One of the major challenges in the birth hospital is how best to combine a midwifery care and those medical procedures that are not necessary, to right form the birth as a family intimate and privacy event, if, of course, the child and maternal health would allow this. The first hour after birth is a once-in-a-lifetime occasion for both the baby and the parents, a unique experience, and once lost, it can never be relived.

Keywords: newborn, transition, golden hour, breastfeeding, skin-to-skin contact

1. Introduction

The transition to extrauterine life is a remarkable physiological event that involves a series of modifications that depend on the degree of maturation in late gestation, the process of delivery itself and establishment of independent physiological processes for regulating homeostasis after placenta lost its function. These processes are establishment for respiration, change from parallel to serial circulation, oral feeding, thermoregulation and glucose homeostasis [1]. Respiratory and cardiovascular changes occur simultaneously and are mutually dependent. The triggers of initial first breath are complex and not fully understood yet. Many factors play role in the initiation of breathing, and some of them derive already during the birthing process [2].

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We must admit that these are great and demanding changes that need to occur in a short period. However, it is not the purpose of this chapter to describe the processes that occur in the body of the newborn. The main purpose is to remind the readers how to support these natural processes and not disturb them with unnecessary interventions.

When we speak of mature healthy newborn, midwives have to be alert to observe possible complications; however, the newborn in this case does not need any special interventions. On the contrary, the most precious ingredient for the baby in this immediate postpartum period is time. Midwife has to permit natural processes to occur spontaneously and not force them.

The smooth physiological transition can be promoted already by enabling natural processes of the first and second stages of labor; however, we can claim that physiological third stage is even more directly connected to the newborn. Expectant (physiological) third stage of labor is connected to many advantages; because of the delayed cord clamping, baby gets more red blood cells and hematopoietic stem cells and 30% of additional blood volume that is important for respiratory function. At birth, this blood moves into the infant's lung; the cardiac output to the lung changes from 8–10% in utero to 45% in the immediate newborn period and demands an increased blood volume. An adequate red cell volume is necessary for oxygen delivery and consequently effective tissue functioning, normal pH and circulator integrity.

Right after the birth, remarkable changes in respiration and circulation are occurring in the newborn body. Therefore, midwife has to give the baby time for these adjustments. First minute after the birth of the baby, midwife has to observe and wait, and not overstimulate the baby and manipulate with him/her in order to provide the preconditions for these major and dramatical physiological changes. The decision for procedures of stabilization are suggested to be done after the 1st minute Apgar estimation.

When there is no need for resuscitation, the best place for the baby is by her mother. Separating mother and baby can have harmful effect on breastfeeding and their relationship [3]. Skin-to-skin prevents heat loss. Ludington-Hoe et al. [4] confirmed that mother and baby can synchronize body temperatures, when skin-to-skin is practiced; the energy saved can be used to stabilize heart and respiration rates. With kangaroo method also the initiation of breastfeeding is eased. Evidence suggests that the baby, when undisturbed, usually takes about 45–55 min to find the way to its mother's breast, using the primal reflexes [5]. With the birth environment that provides warmth, safety and intimacy, the baby is able to make essential physiological adaptations. Midwives need to follow these physiological transitional processes.

World Health Organization and United Nations Children's Fund [6] say that all mothers and babies should be kept together after the birth and should be encouraged to practice skin-to-skin in the first hour after delivery, even if mothers do not intend to breastfeed. This opportunity should be offered to all, also mothers and babies after cesarean section or vacuum extraction.

World Health Organization and United Nations Children's Fund [6] recommended that all healthy mothers and babies, regardless of feeding preference and method of birth, have uninterrupted skin-to-skin care beginning immediately after birth for at least an hour, and until after the first feeding. All other procedures of initial newborn care can wait until the end of the fourth stage of labor (3 h after the birth), when the woman and the baby are to be discharged

to the postpartum ward [7]. As Gunn et al. [8, p. 765] acknowledge 'in a situation where both, mother and a child are healthy and well, any actions on the part of the midwife should be made unobtrusively and with fully informed consent of the parents.' More importance should be given to the establishment of mother-infant bond, since contact with mother and baby in the hours after the birth not only fosters attachment, but at the same time fosters child's development [8].

2. Keeping mothers and babies together beyond the moment of birth

The first hour after birth, it is extremely sensitive and important for the stabilization of vital functions (breathing, saturation, blood pressure, thermoregulation, blood sugar stability, the newborn must establish pulmonary and cardiac function, etc.) in both mother and child, as well as the process of attachment between them and father. That is why the first hour after birth some call the golden hour [9].

Family bonding and baby's first breastfeed is very important act after delivery. If mother or baby needs some help or medical advice during first breastfeed, then medical staff should help them at this essential time of birth, for both vaginal and cesarean births. If the mother has general anesthesia, we can put a newborn immediately after birth on father's chest. This increases the effectiveness of breastfeeding, the process of attachment between mother and child, and reduces stress in their child [10].

At the moment of birth time, a mother needs a quiet, dim lighting, warmth and calm environment. She is still in labor. Her uterus needs to contract down. With smooth first hour after birth and mother's skin-to-skin contact to a newborn, we allow the newborn to pass through nine instinctive phases in their behavior. These phases are innate and naturally given to every newborn (**Table 1**).

Phase	Naming	Baby's instinctive behaviors—explanation
1	Crying during the birth	Because of lungs expansion, baby starts crying
2	Relaxation	Baby shows relasxed hands without mouth movements
3	Awakening	Baby shows some movements with hands, heads and shoulders
4	Baby' activity	Baby shows mouthing, suckling and way of movements
5	Baby's rest	Phase without baby's activities
6	Baby's crawling	Baby's recognizing the breast and nipple
7	Recognizing with familiarization	Baby familiarizes the nipple and breast. He also licks, touches and massages it
8	Sucking nipples	Baby is attached and is sucking the nipples
9	Baby's sleeping	Baby's restful sleep

Table 1. Baby's instinctive behaviors during bonding and 'skin-to-skin care' after delivery.

The first stage is the birth cry. This distinctive cry occurs immediately after birth as the baby's lungs expand. The second stage is the relaxation stage. During the relaxation stage, the newborn exhibits no mouth movements and the hands are relaxed. This stage usually begins when the birth cry has stopped. The baby is skin-to-skin with the mother and covered with a warm, dry towel or blanket. The third stage is the awakening stage. During this stage, the newborn exhibits small thrusts of movement in the head and shoulders. This stage usually begins about a few minutes after birth. The newborn in the awakening stage may exhibit head movements, open his eyes, show some mouth activity and might move his shoulders. The fourth stage is the activity stage. The newborn begins to make increased mouthing and sucking movements as the rooting reflex becomes more obvious. This stage usually begins about 8 min after birth. At any stage of the phase, the baby may rest. He may have periods of resting between periods of activity throughout the first hour or so after birth. The sixth stage is the crawling stage. The baby approaches the breast during this stage with short periods of action that result in reaching the breast and nipple. This stage usually begins about 35 min after birth. The seventh stage is called familiarization. During this stage, the newborn becomes acquainted with the mother by licking the nipple and touching and massaging her breast. This stage usually begins around 45 minutes after birth and could last for 20 minutes or more. The eighth stage is suckling. During this stage, the newborn takes the nipple, self-attaches and suckles. This early experience of learning to breastfeed usually begins about an hour after birth. It may take more time with skin-to-skin for the baby to complete the stages and begin suckling, especially for mothers who gave birth by cesarean section. The final stage is sleep. The baby and sometimes the mother fall into a restful sleep. Babies usually fall asleep about 1½–2 h after birth [11].

Continuous skin contact between newborn and mother should not affect on the work of the professional staff in the birth hospital. For example, procedures as it is control postpartum bleeding or disruption of the umbilical cord should be carried out without separation of the mother and newborn. If the birth was spontaneous and the child is not under the influences of medicines, keeping mother and newborn together beyond the moment of birth enables the child to be in a state of openness and vigilance and the most susceptible to the first impressions of the outside world. In the opinion of many eminent scientists of the child to design a basic response patterns, intimacy and sociality, which are matrix for all life [9, 12], one of the major challenges in the birth hospital is how best to combine a midwifery care and those medical procedures that are not necessary, to right form the birth as a family intimate and privacy event, if, of course, the child and maternal health would allow this [9, 11, 13]. Preventing separation except for compelling medical indications is an essential safe and healthy birth practice and an ethical responsibility of health-care professionals [14].

During the first hour after birth, many of hormones are releasing: dopamine, oxytocin, prolactin and estrogen. All these hormones initiate maternal instincts. Skin-to-skin contact allows that the mother and child are more relaxed and connected to each other. Whatever promotes the attachment between mother and child: touching, dermal contact, frequent eye contact and so on also promotes the development of a child's brain. Skin contact activates the amygdala, which is a part of the limbic system in the brain that regulates emotional learning, memory processing and detection appetite. This part of the brain is the most developed in just the first

two months of a child's life. Oxytocin receptors in a woman's brain increase during pregnancy. When baby is born, mother is more responsive to this hormone that promotes maternal behavior. Oxytocin is produced in large amounts when breastfeeding and holding babies are close skin-to-skin. Initial attachment has a positive effect on the formation of self-esteem of both parents, because the parents more quickly identify the child's needs and can respond on it. From the child's perspective, the separation from his mother is life-threatening. Keeping mothers and babies together beyond the moment of birth protects the child against the negative consequences of segregation. The frequency of crying and the quantity of stress hormones are lower if child is in skin contact with his mother. In this way, the mother's body heat is also transmitted to the newborn, who is better able to regulate self body temperature and respiration [15]. Skin-to-skin contact heightens response, stimulates behaviors that help to meet the newborn's basic biological needs, activates neuroprotective mechanisms and enables early neurobehavioral self-regulation. Skin-to-skin care reduced maternal physiologic stress and depressive feelings after hospital discharge, which may help to empower women in their role as mothers [16].

3. Behavioral hormonal effects

Blackburn [17] sees hormones as a chemical messengers which either in the body fluids or in blood excert a physiological effect on other cells in other places in the body. The hormones interplay in labor and birth is often compared to an orchestra where every instrument knows exactly how to play perfect notes to create a beautiful melody. If the melody is played well, it sets the stage also in a more immediate way for the postpartum process for both the mother and her baby, because all the different hormones released by mother and fetus during the first and second stages of labor are not yet eliminated during the hour following birth.

One of such hormones is already mentioned oxytocin, which is relatively well studied in relationship to behaviors after birth [18] but still not fully understood [19]. As Phillips [18] notices, it has been shown to increase relaxation, attraction, facial recognition and maternal care-giving behaviors which are all necessary to ensure infant survival. Odent [19] recognizes that oxytocin is never released in isolation. It is always part of a complex hormonal balance in our metaphor part of an orchestra. That means that in the hour following birth, in physiological conditions, the high peak of oxytocin is associated with a high level of prolactin, which is also known as the 'motherhood hormone.' It is known to affect mothering behavior in animals. In humans, oxytocin induces a state of calm and reduces stress [20]. Love and affection between the mother and a child is enhanced, and bonding is optimal. These pleasant moments stimulate the secretion of oxytocin, and also prolactin, and skin-to-skin contact between mother and baby after delivery helps both breastfeeding and emotional bonding [6]. Odent [9] sees this as the most typical situation for inducing love of babies. Oxytocin and prolactin complement each other and are released in response to stimulation by the baby's sucking at the breast. When a baby suckles at the breast, sensory impulses pass from the nipple to the brain. In response, the anterior lobe of the pituitary gland secretes prolactin and the posterior lobe secretes oxytocin [21]. If a mother is in severe pain or emotionally upset, the oxytocin reflex may become inhibited, and her milk may suddenly stop flowing well. In

animals also prolactin is responsible for mothering behaviors [18]. During the first few weeks, the more a baby suckles and stimulates the nipple, the more prolactin is produced, and the more milk is produced. This effect is particularly important at the time when lactation is becoming established, right after the birth.

Oxytocin is responsible for increasingly strong and effective contractions during the labor. And when, during the labor, levels of oxytocin rise, endorphins (sometimes called natural opiates) are released. Beta-endorphin is secreted by the pituitary gland in times of pain and stress. It activates the mesocorticolimbic dopamine reward system and produces pleasure in association with sex, birth and breastfeeding. It is known by now that after birth, both mother and a baby are saturated with natural opiates if the birth is physiological. They reinforce the mother-infant bond and contribute to ecstatic feelings for both [21]. Endorphins also help make the transition to extrauterine life easier for the baby, facilitating relaxation and calm [18].

As the baby descends during the labor, in fact close to the actual birth also catecholamines are released. Sometimes they are called 'fight or flight' hormones: epinephrine (adrenaline) and norepinephrine (noradrenaline).They are secreted from the adrenal gland above the kidney in response to stresses such as fright, anxiety, hunger or cold, as well as excitement, when they activate the sympathetic nervous system for fight or flight. During birth, when women are scared or have difficulty coping with pain, they can be overproduced and can inhibit production of oxytocin. However, normal values ensure mother is alert when baby is born; also, baby is alert, with eyes wide opened and trying to make eye contact with mother [19].

To our current knowledge, many *different hormones* can *influence* several *types of behavior*, but for the purpose of getting to know the behavioral effects of different hormones involved in the birth process, four most important ones were described. It is known by now that all the different hormones released by the mother and by the baby during labor and delivery are not eliminated immediately. By knowing that, we realize it is essential to promote best practices already in labor processes.

4. First hour and maternal attachment behaviors

Maternal attachment and bonding does not start at birth; from psychological point of view, the system has been prepared during the whole pregnancy, when mother imagines her baby and when the baby gets to know the odor, voice and smell of mother [22]. However, after the birth, she encounters him/her for the first time and therefore this time is so crucial for the establishment of the relationship between the baby and the mother/parent. The space for this intimate process must be given to the family and as Gunn et al. [8, p. 765] write: 'the midwife should never undermine the role of the mother who is transitioning into her new role.'

When left undisturbed, mothers demonstrate 'species-specific behavior' [23]. Mother explores her baby with her fingertips, then strokes the child and even then cuddles him/her into her arms, facing her. She establishes eye contact, talks to her baby and then introduces him/her to partner [8]. She progresses through three major steps:

- Her first preoccupation is the survival of the baby.
- Then, she needs to know that everything is fine with the baby.
- Once reassured that the baby is healthy, mother wants to make the baby her own. She seeks physical resemblance.

These steps are crucial for every new mother; however, this is not yet a relationship [24]; attachment is much more complex and takes more time to be established. The initial emotional connection that mother establishes with her newborn baby is called bonding [25]. It was believed that bonding is one-way relationship (from parents toward child), under the strong influence of important maternal and infant oxytocin that promotes empathy. Other neurotransmitters such as opioids and dopamine also play role in the bonding process [26–28]. It can be therefore concluded that bonding is eased when the birth process is natural and all these hormones are expressed. Within the context of the results of latest research, the experts began to question whether bonding is really a one-way relationship. Feldman et al. [29] found synchronic levels of oxytocin in infants and mothers who interacted with them. These high levels of oxytocin in baby help her/him to adapt to extrauterine life [16]. Despite the fact that babies communicate nonverbal, they respond to parents.

Also, the baby responds facially to mother's voice, especially in the case of physiological birth, right after the birth, when the baby is in a quiet alert state, aware of the surrounding and uses all his/her senses. The baby has competencies to develop ties with parents [24]. Besides voice, his/her strongest sense is scent, necessary to find the mother's breast. After the first feed, baby usually gets to sleep that can last even 6 h [30].

All these (nonverbal, mostly facial) responses of the baby evoke interaction with parents that sets grounds for developing a bond among them. They were acknowledged already by Bowlby [31]. He proposed that there is an attachment system that is biologically based and promotes survival. He claimed that infants have specific behaviors that attract proximity of the caregiver in order to survive or to be emotionally connected, so-called proximity-seeking behavior. Repetitions of such interactions by the caregiver lead to 'internal working model' or internal representation of the attachment relationship [32].

The infant, despite that he/she is not verbal yet, generates these affective, sensorimotor activities from parents. He cannot self-regulate yet, but can learn this capacity through parental care-giving behaviors and his own ability to self-regulate [32]. It is therefore of crucial importance that woman is relaxed and in touch with her own feelings.

Reid and Freer [33] wrote that maternal role develops smoothly when mothers' self-esteem in mothering abilities is enhanced. Midwife can strengthen her perception with different interventions. If they make parents aware of babies' behavioral and autonomic cues, they can be more confident in caring for their newborn, taking into account the child's individual tolerance (for habituation to noise, light, etc.) [34].

Benefits of skin-to-skin for attachment, breastfeeding and thermoregulation are well known, and new insights, however, revealed even other advantages. Colonization of the baby with the mother's microbiome occurs first during vaginal delivery, later on with her skin microbes,

and during initial breastfeeding, also the newborn gut is colonized with microbes that built normal gastrointestinal flora.

5. A metabolic perspective

When newborn transits to a life outside a womb, it must adapt to many new circumstances. One is metabolic transition, which is not as dramatic as, for example, changes in cardiopulmonary systems, but equally complex and essential for survival. As Colson [35] notices cardiopulmonary, immune and thermal adaptations are well documented, but most texts fail to describe the normal physiological metabolic transition from fetus to neonate.

Just after birth, as soon as the umbilical cord ceases to pulsate, placental circulation stops. This means that the constant supply of maternal nutrition especially glucose transferred via the placenta stops. Before the birth, no significant production of glucose has been demonstrated [36]. In utero insulin is being used as a growth hormone instead of being a metabolic regulator. Colson [35] explains that the processes of lipogenesis (formation and storage of fat in the form of adipose tissue) and glycogenesis (formation and storage of glucose in the form of glycogen in the liver, cardiac muscle and brain) are replaced by the metabolic pathways of neonatal life. These are glycogenolysis (breakdown of glycogen), lipolysis (breakdown of fats), gluconeogenesis (endogenous glucose production) and ketogenesis (formation of ketone bodies).These pathways imply a metabolic switch at birth from glucose to fat and therefore a diet initially lower in carbohydrate and high in fats. It is true that while neonatal blood glucose levels immediately fall in almost all healthy infants, it must adapt to intermittent feeding, digestion and intestinal absorption of nutrients (adapted from Colson, p. 13). The fetus prepares for his transition mainly by storing glycogen, producing catecholamines and depositing brown and white fat [37]. After the birth, hepatic glycogen stores are mobilized and hepatic synthesis of glucose from noncarbohydrate substrates enuses. This substrate enters the citric acid cycle and produces adenosine triphosphate, which serves as the energy source for the brain [37]. These events actually allow baby to gradually mobilize glucose to meet energy requirements. So-called transient neonatal hypoglycemia is a process of normal adaptation to extrauterine life, and it is important that we realize that in first 3–4 h healthy newborn could have low blood glucose levels.

Colson [35] exposes several practices that stand behind understanding of the normal metabolic physiology:

1. Metabolic transition is not generally taught in midwifery and medical curricula as part of normal postnatal adaptation from fetus to neonate. Descriptions of metabolic changes are absent or sparse. When present, they are usually rooted in pathology.
2. Research has shown that patterns of metabolic adaptation are different according to whether the baby is breastfed or has artificial feeds and this is largely ignored in midwifery and pediatric assessment. Mixed feeding is common in the first three days postnatal even when the mother wants to breastfeed exclusively.

3. Furthermore, in the early postnatal days, current breastfeeding definitions disregard dose. A baby is considered to be breastfed when receiving any amount of mother's milk, however small. Not knowing whether the baby is exclusively breastfed blurs the understanding of those clinical characteristics associated with a baby who is wholly breastfed.

4. Mothers are often encouraged to swaddle their babies from birth and to keep them in the cot unless they are actively feeding. This practice assumes that the continuity of maternal nutrition ends at birth as in bottle-feeding. Immediate swaddling also accentuates the discontinuity of postnatal transition, as mothers are physically separated from their babies even when they are in the same room. The early physical separation negates the continuity and postnatal effectiveness of the maternal body to maintain a homeostatic neutral/thermal environment from fetus to neonate. Keeping babies in the cot in between feeds instead of holding them during the first three days postpartum may have a negative effect upon early nurturing and breastfeeding.

5. Maternal choice rather than physiology provides the framework that underpins midwifery assessment. When there are breastfeeding problems in the first three days postnatal, a bottle-feeding solution is often offered. For example, when the baby demands breastfed and is unsettled, it is often believed that mother's early colostral milk is insufficient. Mothers are often told that they can give the baby a bottle if they want. The irony is that maternal choice then appears to motivate supplementation. One often sees written in the notes 'baby unsettled, mother requested bottle' (Colson, p. 12).

In order to optimize metabolic adaptation, babies and mothers must be kept closely together after birth. Health workers must encourage mothers to maintain close body contact with their babies as often as they want in an undisturbed environment [38].

6. Impacts on infant microbiome assembly

The human body is colonized by a vast number of microbes, collectively referred to as the human microbiota. The average human has over 100 trillion microbes in and on their body, and many of the latest discoveries are challenging previously held ideas about good and bad bacteria. Funkhouser and Bordenstein [39] say that the human microbiota comprises only 1–3% of an individual's total body mass, outnumbering human cells 10 to 1 and adding over 8 million genes to our set of 22,000. At the beginning of the twentieth century, French pediatrician Henry Tissier said that human infants develop within a sterile environment and acquire their initial bacterial inoculum while traveling through the maternal birth canal but now the sterile womb hypothesis remains dogma. The intrauterine environment during healthy pregnancy has been presumed to be free of, although recent evidence of microbes presents in the amniotic fluid, umbilical cord blood, fetal membranes and placenta of healthy term pregnancies after both vaginal and C-section delivery has challenged this belief [40]. It is known by now that human infants are colonized with maternal vaginal and fecal microbes as they exit the birth. The way how is known to have long-term consequences on mothers and child

health. This is especially important considering immune-mediated diseases. For example, children born via C-section are significantly more likely to develop allergic rhinitis, asthma, celiac disease, type 1 diabetes and inflammatory bowel disease [40].

Besides mode of delivery, breastfeeding also provides a route of maternal microbial transmission. Breast milk was considered sterile at first, but in colostrum collected aseptically already harbors hundreds of bacterial species [39].

To ensure the best maternal transmission of beneficial microbes, Reed [41] has made following suggestions:

- Baby should be naked on mothers chest immediately following birth for at least an hour and a lot in following frost days.
- Avoid bathing baby for at least 24 h after birth [42]. Use own linen from home for baby if in hospital.
- Minimize the handling of baby.
- Exclusively breastfeeding. If not, probiotics should be considered.
- Avoid unnecessary antibiotics for the baby [43, 44].
- Probiotics may also be beneficial for babies suffering from colic.

The complex symbiosis between humans and microbes is important for our health, and breastfeeding benefits the health and well-being of infants. Maternal transmission is also a key factor in shaping the structure of the microbiome in animal species over evolutionary time, since microbes that promote host fitness, especially in females, will simultaneously increase their odds of being transferred to the next generation; therefore, it is essential to create optimal conditions to achieve the transmission.

7. First hour and breastfeeding

Breastfeeding has many advantages for the child, mother and the environment. The smooth first hour after birth and mother's skin-to-skin contact to newborn have positive impact on the effectiveness and duration of breastfeeding. Shorter intervals between birth and the start of skin-to-skin care and longer times spent skin-to-skin after birth improved breastfeeding exclusivity and duration. In the first month, woman has to breastfeed as often as the newborn wants or even more. With this the production of milk is assured. Many females are meeting with problem of too small amount of milk. The most frequent reasons are too little ingested liquid and disorderly diet. The problem can also be tiredness, increased amount of stress and rare short passing feeds. Relaxed and satisfied mother, who lives in a pleasant and tranquil environment, will have much better conditions for smooth milk lactation. The production and amount of milk is determining by the law of demand and offer. Birth environment and each health professional in their professional action may be more or less supportive impact on the ability and confidence of women to be born, breastfeeding and care for the baby, and baby's

ability to effectively breastfeed. Full breastfeeding can of course be established successfully after a cesarean section also. The beginning of the milk secretion can be delayed after caesarean section, however, there is no rule. It is important to know that a child for successful feeds need to have a search reflexes, reflexes of swallow and sucking reflex which is instinctive. The way of the childbirth does not have influence per this. It is true that the first feed is postponed as a mother is put to sleep during an intervention. Clinical staff has to help her to add a child only after a certain time, when a mother is wake and she is aware of herself and surroundings. There are qualified professionals working in various medical institutions that hold a specific and additional knowledge about lactation and breastfeeding. With breastfeeding, the 'good bacteria' from the mother's body with a calm environment create good conditions for the development and strengthening of the child's immune system. The WHO and UNICEF are recommending three important breastfeeding activities: (1) early breastfeeding and skin-to-skin contact with mother just after the birth; (2) exclusive breastfeeding to baby's age of 6 months without other food or liquids and (3) continued breastfeeding to baby's age of 2 years or even more. Meantime, the child can get complementary foods like soft foods and liquids, etc. [45–47]. Early breastfeeding and skin-to-skin contact immediately after birth keep a baby warm and have positive influence on their immune system. Despite that breastmilk is the best food with antibodies for baby's development, it also has effects on mother's ability of continuing exclusive breastfeeding. Mothers who breastfeed also have a (1) early initiation of breastfeeding—place newborns skin-to-skin with their mother immediately after birth, and support mothers to initiate breastfeeding within the baby's first hour of life; (2) exclusive breastfeeding—provide only breastmilk to infants from birth until 6 months of age, with no other food or liquids (including water); (3) continued breastfeeding—breastfeeding until age 2 or longer, in addition to adequate and safe solid, semisolid or soft foods (also called complementary foods) [45–47]. Immediate skin-to-skin contact and starting breastfeeding early keeps a baby warm, builds his or her immune system, promotes bonding, boosts a mother's milk supply and increases the chances that she will be able to continue exclusive breastfeeding. Breastmilk is more than just food for babies—it is also a potent medicine for disease prevention that is tailored to the needs of each child. The 'first milk'—or colostrum—is rich in antibodies to protect babies from disease and death, lower risk of developing breast and ovarian cancers. Breastfeeding can also delay mother's ovulation [13, 47].

One of the important factor that contributes to good establishment of breastfeeding is adding of the newborn to the mother's chest as soon as possible after birth, advisably to first half an hour or at least in hour after childbirth. If mother needs an advice or help during this time, it is very important that she gets it. First of feeds is introducing the first food and the first immunization to a child which further encourages the production of colostrum. Baby's sucking reflex is expressed the most during the first hour after a birth. It is awaken during skin-to-skin contact and care. If the mother is breastfeeding the newborn immediately after birth, the hormonal balance during pregnancy is established for a long time, which very favorable impacts on mother's overall health being. In addition, under the influence of the hormone oxytocin, which is secreted, while a newborn stimulates mother's nipples, the uterus intensively cramps and quickly returns to its original size. And this reduces the likelihood of severe bleeding after childbirth. Oxytocin, which increases significantly during skin-to-skin care, promotes

newborn attachment, reduces maternal and newborn stress and helps the newborn transition to postnatal life. With breastfeeding in first hour, the child also has a stable heart rhythm without bradycardia. The possibility of apnea is reduced by 75%, since the depth of each breath becomes more stable [9, 13, 48].

Colonization by mother's bacteria and first lactation colostrum, which creates an optimal intestinal flora, is an optimal protection of the child immunity from possible allergies which might otherwise can be developed later in child life. Breastmilk is more than just food—it is also a potent medicine. It protects the child against disease, regulates the child's immune system and helps child to digest the food [47]. This process helps to program the healthy development of the infant's gut microbiome for life. There is evidence, for example, that breastmilk can help to counteract an infant's genetic predisposition for obesity and other chronic diseases. So the first hour after birth is a critical period with irreversible consequences from the point of bacteriological view [12, 48]. More on that can be found in impacts on infant microbiome assembly chapter.

Mother's breasts are natural thermoregulator to maintain the body temperature of a child. They regulate the temperature of a child. If the child is cold, the breast temperature increases, or if the child is warm, the breast temperature falls. Mother's breasts are also natural thermoregulator for child's respiratory and heart rates [8, 10, 48].

An undisturbed first hour with skin-to-skin also reduces the risk of hypoglycemia (see chapter about metabolic adaptation). Newborn babies can produce glucose from their body stores of energy until they are breastfeeding well and are more likely to do so when they remain skin-to-skin with their mothers. Breastfeeding extended period of natural immunity against mumps, measles and polio. Colostrum has a laxative effect and helps to facilitate the elimination of the first child's stool. It is extremely easy to digest and does not cause constipation. The child has also less troubling with abdominal cramps. As long as the child is breastfed, it is protected against many infections, because breast milk receipt of child antibodies that protect against diseases that can overcome its mother. The child is also protected against ear infections, diarrhea, gastrointestinal infections and diseases of the respiratory tract. For breastfed infant, it is less likely to be diagnosed with meningitis and childhood diabetes. An active intake (compared with passive swallowing bottle) promotes the proper development of the jaw, the mouth muscles and cheek bones, resulting in a very favorable impact on the development of children's speech.

8. Conclusion

First hour following birth for mature newborn is without doubt the most critical hour in life of human beings. During this time, a lot of changes happen. When woman gives birth, all the hard work she does generate changes in the chemistry in the brains. It makes women want to nurture her child. These hormones also cause the uterus to contract, shrink and stop bleeding.

Based on decades of evidence, the World Health Organization and United Nations Children's Fund [6] recommended that all healthy mothers and babies, regardless of feeding preference

and method of birth, have uninterrupted skin-to-skin care beginning immediately after birth, lasting for at least an hour.

There is still a lot of unnecessary interventions in the first hour after birth in many maternity hospitals. Routine procedures are being carried out starting from early cord clamping to vitamin K injection, eye prophylaxis antibiotic ointment, navel prophylaxis, foot and hand printing, weighing, measurements and bathing and others. All health-care providers should know that immediate skin-to-skin contact is the best way for a newborn and mother to bond. Healthy newborns should be placed in 'skin-to-skin' contact with the mother until the first round of breastfeeding is established. Skin-to-skin care means placing dried, unclothed newborns on their mother's bare chest, with warmed light blankets or towels covering the newborn's back. Women who have a planned or unplanned C-section would not be in the ideal position for intimate bonding right away. Baby could be taken to a warming table for a quick assessment first. Authors [18] claim that there is no reason why stable mothers should not have the experience of skin-to-skin contact after cesarean births, to collect the same short- and long-term benefits of it. Even from psychological point of view, it helps them mourn the loss of a normal vaginal birth.

The first hour should be focused on baby's first breastfeed and mother-baby and family bonding. The manner in which a new baby is welcomed into the world during the first hours after birth may have short- and long-term consequences.

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References

[1] Coad J, Dunstall M. The transition to neonatal life. In: Anatomy and Physiology for Midwives. 3rd ed. Edinburgh: Churchill Livingstone, Elsevier; 2011. pp. 379-403

[2] Novak B. Adaptations to extrauterine life—respiration and cardiac functions. In: Stables D, Rankin J, editors. Physiology in Childbearing with Anatomy and Related Sciences. 3rd ed. London: Elsevier; 2010. pp. 641-656

[3] Crenshaw JT. Healthy birth practice #6: Keep mother and baby together—it's best for mother, baby, and breastfeeding. The Journal of Perinatal Education. 2014;**23**(4):212-219

[4] Ludington-Hoe SM, Lewis T, Cong X, Anderson L, Morgan K, Reese S. Breast and infant temperatures with twins during shared kangaroo care. Journal of Obstetric, Gynecologic & Neonatal Nursing. 2006;**35**:223-231

[5] Widström AM, Lilja G, Aaltomaa-Michalias P, Dahllöf A, Lintula M, Nissen E. Newborn behaviour to locate the breast when skin-to-skin: A possible method for enabling early self-regulation. Acta Paediatrica. 2011;**100**(1):79-85

[6] World Health Organization, United Nations Children's Fund. Baby-Friendly Hospital Initiative: Revised, Updated, and Expanded for Integrated Care. Geneva, Switzerland: World Health Organization; 2009. Available from: http://whqlibdoc.who.int/publications/2009/9789241594967_eng.pdf [Accessed: February 23, 2017]

[7] Jug Došler A, Petročnik P, Mivšek AP, Škodič Zakšek T, Skubic M. Neonatal prophylaxis: Prevention of vitamin K deficiency haemorrhage and neonatal ophthalmia. Zdravstveno Varstvo. 2015;**54**(3):184-193

[8] Gunn J, Davies L, Baddock S. Supporting the newborn. In: Pairman S, Pincombe J, Thorogood C, Tracy S, editors. Midwifery: Preparation for Practice. 3rd ed. Sydney: Churchill Livingstone, Elsevier; 2014. pp. 764-801

[9] Odent M. The First Hour Following Birth: Don't Wake the Mother! Midwifery Today [Internet]. 2002. Available from: https://www.midwiferytoday.com/articles/firsthour.asp [Accessed: February 23, 2017]

[10] Stevens J, Schmied V, Burns E, Dahlen H. Immediate or early skin-to-skin contact after a caesarean section: A review of the literature. Maternal & Child Nutrition. 2014;**10**(4):456-173. DOI: 10.1111/mcn.12128

[11] Brimdyr K. The First Hour after Birth. A Baby's 9 Instinctive Stages. East Sandwich: Healthy Children Project [Internet]. 2015. Available from: http://magicalhour.com/aboutus.html [Accessed: February 23, 2017]

[12] Newman J. The Importance of Skin to Skin Contact. Breast Feeding Inc. [Internet]. 2009. Available from: http://www.breastfeedinginc.ca/content.php?pagename=doc-ISSC [Accessed: February 23, 2017]

[13] Centers for Disease Control and Prevention. Strategies to prevent obesity and other chronic diseases: The CDC Guide to Strategies to Support Breastfeeding Mothers and Babies. Atlanta: U.S. Department of Health and Human Services. 2013. Available from: https://www.cdc.gov/breastfeeding/pdf/BF-Guide-508.PDF [Accessed: June 7, 2017].

[14] Crenshaw CT. Keep mother and baby together—it's best for mother, baby and breastfeeding. The Journal of Perinatal Education. 2014;**23**(4):211-217. DOI: 10.1891/1058-1243.23.4.211

[15] Raylene P. The sacred hour: Uninterrupted skin-to-skin contact immediately after birth. In: Browne VJ, White R, Talm A, editors. Newborn and Infant Nursing Reviews. New York: Elsevier; 2013. pp. 67-72. Available from: http://www.medscape.com/viewarticle/806325 [Accessed: February 24, 2017]

[16] Buckley SJ. The Hormonal Physiology of Childbearing. New York: Childbirth Connection; 2014

[17] Blackburn ST. Maternal, Fetal, & Neonatal Physiology: A Clinical Perspective. 3rd ed. St. Louis: Saunders Elsevier; 2007

[18] Phillips R. Uninterrupted skin-to-skin contact immediately after birth. Newborn & Infant Nursing Reviews. 2013;**13**(2):67-72

[19] Oden M, editors Davids L, MacDonald S. Examination of the Newborn and Neonatal Health. 1st ed. London: Churchill Livingstone, Elsevier; 2008. pp. 95-107

[20] Uvnas-Mobert K. The Oxytocin Factor: Tapping the Hormone of Calm, Love and Healing. Cambridge, MA: Da Capa Press; 2003

[21] WHO. Baby-Friendly Hospital Initiative [Internet]. 2009. Available from: http://www.who.int/nutrition/publications/infantfeeding/bfhi_trainingcourse/en/ [Accessed: February 23, 2017]

[22] Sullivan R, Perry R, Sloan A, Kleinhaus K, Burtchen N. Infant bonding and attachment to the caregiver: Insights from basic and clinical science. Clinics in Perinatology. 2011;**38**(4): 643-655

[23] Bergman N. More than a cuddle: Skin-to-skin contact is key. Practising Midwife. 2005; **8**(9):44

[24] Bruschweiler-Stern N. The neonatal moment of meeting—building the dialogue, strengthening the bond. Child and Adolescent Psychiatric Clinics of North America. 2009;**18**(3):533-544. DOI: 0.1016/j.chc.2009.02.001

[25] McPhail M, Martin C, Redshaw M. Perinatal Mental Health: A Clinical Guide. Cumbria: M & K Publishing; 2012

[26] Levine A, Zagoory-Sharon O, Feldman R. Oxytocin during pregnancy and early postpartum: Individual patterns and maternal-fetal attachment. Peptides. 2007;**28**(6):1162-1169

[27] Gordon JI, Dewey KG, Mills DA, Medzhitov RM. The human gut microbiota and undernutrition. Science Translational Medicine. 2012;**4**:137ps12

[28] Nagasawa M, Okabe S, Mogi K, Kikusui T. Oxytocin and mutual communication in mother-infant bonding. Frontiers in Human Neuroscience. 2012;**6**:31

[29] Feldman R, Gordon I, Zagoory-Sharon O. Maternal and paternal plasma, salivary, and urinary oxytocin and parent-infant synchrony: Considering stress and affiliation components of human bonding. Developmental Science. 2011;**14**:752-761. DOI: 10.1111/j.1467-7687.2010.01021.x

[30] Colson S. What happens to breastfeeding when mothers lie back? Clinical Lactation. 2010;**1**:11-14

[31] Bowlby J. Attachment and Loss: Attachment. Vol. I. New York: Basic Books; 1969/1982

[32] Birss SA. Transition to parenthood: Promoting the parent-infant relationship. In Nugent JK, Keefer CH, Minear S, Johnson LC, Blanchard Y, editors. Understanding Newborn

Behavior and Early Relationships: The Newborn Behavioral Observations [NBO] System Handbook. Baltimore, MD: Paul H. Brookes; 2007. pp. 27-49

[33] Reid T, Freer Y. Developmentally focused nursing care. In: Boxwell G, editor. Neonatal Intensive Care Nursing. London: Routledge; 2001. pp. 14-44

[34] England C. The healthy low birth weight baby. In: Marshall J, Raynor M, editors. Myles Textbook for Midwives. 16th ed. Edinburgh: Churchill Livingstone, Elsevier; 2014. pp. 617-627

[35] Colson S. Womb to World—Adaptation from Foetus to Neonate from a Metabolic Perspective. Midwifery Today [Internet]. 2002. Available from: www.midwiferytoday.com/articles/womb.asp [Accessed: February 23, 2017]

[36] Ward Platt M, Deshpande S. Metabolic adaptation at birth. Seminars in Fetal & Neonatal Medicine. 2005;**10**(4):341-350

[37] Davies L, Richards R. Maternal and newborn transition: Adjustment to extrauterine life. In: Davies L, McDonald S, editors. Examination of the Newborn and Neonatal Health: A Multidimensional Approach. London: Elservier; 2008. pp. 107-126

[38] Colson S, DeRooy L, Hawdon J. Biological Nurturing increases duration of breastfeeding for a vulnerable cohort. MIDIRS Midwifery Digest. 2003;**13**(1):92-97

[39] Funkhouser LJ, Bordenstein SR. Mom knows best: The universality of maternal microbial transmission. PLoS Biology. 2013;**11**:e1001631. DOI: 10.1371/journal.pbio.1001631

[40] Cabrera-Rubio R, et al. The human milk microbiome changes over lactation and is shaped by maternal weight and mode of delivery. American Journal of Clinical Nutrition. 2012;**96**:544-551

[41] Reed R. The Human Microbiome: Considerations for Pregnancy, Birth and Early Mothering [Internet]. 2017. Available from: https://midwifethinking.com/2016/04/13/the-human-microbiome-considerations-for-pregnancy-birth-and-early-mothering/ [Accessed: February 23, 2017]

[42] Tollin M, et al. Vernix caseosa as a multi-component defence system based on polypeptides, lipids and their interactions. Cellular and Molecular Life Sciences. 2005;**62**:2390-2399

[43] Ajslev TA, Andersen CS, Gamborg M, Sørensen TI, Jess T. Childhood overweight after establishment of the gut microbiota: The role of delivery mode, pre-pregnancy weight and early administration of antibiotics. International Journal of Obesity. 2011;**35**:522-529

[44] Penders J, Thijs C, Vink C, Snijders B, Kummeling I, van den Brandt PA, et al. Factors influencing the composition of the intestinal microbiota in early infancy. Pediatrics. 2006;**118**:511-521. DOI: 10.1542/peds.2005-2824

[45] Moore ER, Anderson GC, Bergman N, Dowswell T. Early skin-to-skin contact for mothers and their healthy newborn infants. Cochrane Database of Systematic Reviews. 2014;**16**(5):CD003519. DOI: 10.1002/14651858.CD003519.pub3

[46] Chamberlain D. Windows to the Womb. Revealing the Conscious Baby from Conception to Birth. Berkley, CA: North Atlanta Books; 2013

[47] United Nations Children's Fund (UNICEF). From the First Hour of Life: Making the Case for Improved Infant and Young Child Feeding Everywhere. New York: UNICEF; 2016. Available from: https://data.unicef.org/wp-content/uploads/2016/10/From-the-first-hour-of-life.pdf [Accessed: June 7, 2017].

[48] Richardson H. Kangaroo care: Why does it work? Midwifery Today. 1997;**44**:50-52. Available from: http://www.midwiferytoday.com/articles/kangaroocare.asp [Accessed: February 24, 2017]

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