The appendix S1 is taken from the review Skin-to-skin contact after birth: developing a research and practice guideline, K Brimdyr et al 2023.https://onlinelibrary.wiley.com/doi/epdf/10.1111/apa.16842

Appendix S1: Pragmatic Implementation Guide for Skin-to-Skin Contact after Birth

Antenatal/Prenatal

Action	Reference
Educate all staff, including antenatal, delivery, neonatal, anesthesia, intensive care, surgical and recovery staff, about the importance of safe, immediate, continuous, uninterrupted skin-to-skin contact.	1–7
Educate pregnant parents about the importance of immediate, continuous, uninterrupted skin-to-skin contact and the infant's instinctive behaviors (9 Stages)	5,8
Have a written evidence-based protocol	1,9

During the birth

Action	Reference
Just before the birth, prepare for the placement of the infant on the bare abdomen/chest of the mother. *Ensure that the mother's chest is naked. Remove barriers such as clothing or a bra. Make sure that the clothes can be lifted/moved so the chest can be bare when the infant goes skin to skin. Prior to cesarean surgery, place the access cannula and the blood pressure cuff in the best possible way so that the mother can move her arms, and ensure the clothing can be shifted to allow the baby to be skin-to-skin.*	10,11
Immediately after birth, hold the infant, with gentle hands, in a drainage position to avoid aspiration of mucus, allowing the fluid to flow freely from the mouth and nose at the first breath of the infant.	11,12

Drainage position is when the head is tilted and lower than the torso and the head slightly to the side.	
Gently dry the newborn's entire body, especially the head, with a clean dry cloth to help maintain body temperature. Dry the mother's abdomen/chest if wet. Remove wet or damp towels. *Avoid washing the breasts.*	11–17
Make sure that the mother is in a comfortable semi-reclined (15% - 45%) position when receiving the infant. *A semi-reclined position is conducive to the infant's breathing adaptation, in contrast to a horizontal position.*	11,12,18
Place the infant, or support the mother with the help of the companion to place the infant, in a lengthwise position on the mother's abdomen. Prepare the parents for the newborn's movements, since, at the appropriate stages, the newborn's feet will massage the mother's uterus, and the baby will self-propel upwards and to the sides. *The skin contact between the infant and the mother should be over as large area as possible, because the parent's skin is the infant's heat source. Initially, the infant's head should be turned to the side, as this facilitates free airways and allows for monitoring of the baby's breathing. The lengthwise position on the mother's body emphasizes the importance of the upcoming stages. Avoid positioning the infant's mouth close to the mother's nipple to avoid the focus on immediate breastfeeding, which the newborn is not ready to do yet.* *Premature infants and infants with low muscle tone need help to be kept curled up and the head position must be checked continuously so that the infant maintains free airway*	10–12

and does not collapse. The premature infants' temperature must be checked regularly. Protocol for stop criteria should be created locally, to include types of resuscitation, intubation or immediate surgery. **During a cesarean surgery, the newborn may be placed across the mother's breasts, horizontally instead of vertically. The placement is above the drape and if possible, with head and chest slightly elevated.** *This position requires additional attention from the staff to watch the infants breathing and to ensure that the infant does not push or jump-off of the mother. Educate the companion to support the newborn, gently holding the newborn's leg.*	
Cover the whole infant with a dry clean unfolded blanket/towel/cloth with the face uncovered. Support the mother's neck/head with a pillow/rolled up blanket or clothes so that she can see the infant. *Change the blanket/towel/clothes after a while if the cloth feels damp. Only premature infants and infants who are small for gestational age (SGA) must wear a cap especially in the operating room if air-conditioned.*	11,12,19
If administration of vitamin K shot is required, this should occur soon after birth while the catecholamine levels are highest, *preferably with the newborn infant skin-to-skin with the mother, as skin-to-skin contact has been shown to lower the baby's reaction to pain in the postpartum.* *The pressure on the head through the birth canal may be the cause of extremely high catecholamine level after birth, a level 20 times higher than that of a resting adult.* ***This high catecholamine concentration might partly explain the higher pain threshold in the baby close to birth*** *and be a mirror of nature's way to relieve pain in the baby when*	20–22

passing through the birth canal. Consequently, the baby's temporarily impaired sensation at birth causes the relaxation stage, during which the baby has decreased sensitivity to the surroundings.	
Cut the cord when the baby is on mother's chest. Leave the cord long. *Evidence points to at least 1 minute before clamping the cord of a newborn who is < 35 weeks and wait at least 3 minutes for >=35 weeks. The umbilical cord should be left long. If clamps are used instead of rubber bands, do not clamp close to the newborn's abdomen. The newborn can be uncomfortable laying directly on the clamp in the desired prone position. This can result in newborns lifting their body from the mother's chest, which reduces skin-to-skin contact and thus compromises the newborn's temperature. It can also cause a cry of discomfort. If the cord is too long, it can be cut later.*	11,12,23–26
Perform assessments and administer routine procedures while the newborn remains in skin-to-skin contact. *This can include vital signs, Apgars, etc.*	11,12,27,28
Make sure the infants airway, nose and mouth always are free. The face should not be covered by a blanket or by the mother's breast or body. Educate the mother/parents so they are aware of these concerns and are focused on the infant when skin-to-skin. *If the mother has received analgesics during labour, special care must be taken to watch for free airways. The newborn must have the opportunity to use its reflexes to lift the head so the nose and mouth can be free. Be aware that medications taken by the mother may impair the newborn's reflexes enough to prevent the ability to lift the head to protect itself from suffocation so increased monitoring may be necessary. Extra attention may also be required during postpartum suturing.*	10–12,30

Educate parent/companion to observe infant for: - *Clear airway* - *Breathing* - *Pink lips* - *Baby moving (or the like)* - *9 Stages – especially that the Resting stage does not mean the baby is done!* *And alert staff if concerned. Although neonatal life-threatening events are very uncommon during the first hours after birth, it is important that the staff remain vigilant while the mother and newborn are skin-to-skin.*	29
Allow the newborn to move through the 9 Stages *Widström's 9 Stages during skin-to-skin contact immediately after birth.* *1. The birth cry: a distinct and specific cry as the baby's lungs expand for the first time.* *2. Relaxation: a time immediately after the birth cry ends, when the baby becomes still and has no visible movements.* *3. Awakening: as the baby opens the eyes for the first time, blinks, has small mouth movements and limited hand and shoulder motions.* *4. Activity: larger body movements, including whole arm motions, specific finger movements, shoulder motion, head lifting, and stable open eyes.* *5. Rest: could happen at any point during the first hour, interspersed between stages or as a transition between stages.* *6. Crawling: the baby moving purposely towards the breast and nipple. It could be accomplished through sliding, leaping, bobbing, or pushing.* *7. Familiarization: the baby licks, tastes, touches, and moves around the nipple and areola area.*	11,12,31

8. Suckling: the baby self-attaching to the nipple and initiating breastfeeding. *9. Sleeping: an involuntary activity of the baby around 1.5 to 2 h after birth.* *Be aware of the impact of labor medications on newborn's instinctive behaviors. Because suckling could be delayed by several hours due to labor medications, skin-to-skin contact should continue until the completion of the first breastfeeding.*	32,33
The nipple must be accessible to the newborn during the time the infant starts searching for the breast. Verify that the parents recognize how the accessible nipple contributes to the familiarization stage. *Access to the nipple is of special concern if the mother has large and/or soft breasts. For some mothers, this may require positioning a towel or pillow under or on the side of the mother's breast to prevent the breast from falling to the side. Take the opportunity to inform the parents when the baby licks and touches the areola and nipple that this might take up to 20 minutes or more. Understanding the familiarization stage is important to avoid forcing the infant to the breast with the misunderstanding that the baby is unable to latch.*	11,12
Ensure that the mother's arms are supported so she does not hinder the infant from moving by placing her arms over her infant. Consider how to position the arms in a way that can assist in protecting the infant from falling. Create support under the feet if the infant feet and legs are moving in the air. *If the mother mentions that she is too tired to have skin-to-skin with her infant, make sure before you remove the infant that you have offered her all the support that can facilitate skin-to-skin. Sometimes it can help just to provide support under the arms, move the position in the bed, offer a little water to drink.*	11,12

If it is medically necessary to separate the newborn from the mother for some reason, prepare the companion to have skin-to-skin with the infant until the mother feels better and is stable.	
Wait until after the infant has suckled and/or fallen asleep, or at least an hour for women who are not breastfeeding before weighing, measuring, and administering eye medications to avoid disturbing the innate behaviour of the infant. *If the mother has to transfer to another bed, before an hour or before the infant has suckled, for example in the OR, avoid separating the mother and the infant. The nurse/midwife is responsible for safety and supports the infant with her hands when the infant lies skin-to-skin with its mother during transfer.*	11,12,34,35
Encourage hand expressing colostrum if the infant did not suckle before falling into a deep sleep or if they have not suckled after 90 minutes post birth. *Inform the mother that if she stimulates the breasts by hand within the first hours, the colostrum/breastmilk will come faster and in greater quantity.*	36
Ensure that the families and staff understand the importance of • maintaining a clear airway • keeping the newborn from falling; they might leap or crawl • assuring that the mother is in a comfortable position • keeping the nipple accessible • recognizing each of the 9 stages of newborn behaviour, especially noting the resting and familiarization stages • not interrupting the baby • not forcing the baby onto the breast	

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