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SKIN-TO-SKIN CONTACT IN THE OPERATING ROOM FOLLOWING CESAREAN  
BIRTH

by

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Bachelor of Science in Nursing, Colorado State University – Pueblo, 2010

An Independent Study

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Master of Science

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## PERMISSION

Title            Skin-to-Skin Contact in the Operating Room Following Cesarean Birth  
Department    Nursing  
Degree         Master of Science

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### Abstract

Hospitals around the world are implementing skin-to-skin contact (SSC) between a mother and their infants during a normal vaginal birth but are struggling to implement SSC in the operating room after a cesarean birth. This paper describes the results of a literature review exploring skin-to-skin contact in the operating room and the barriers that nurses and the interdisciplinary team encounter and must overcome when implementing SSC in the operating room. This Independent Study project also describes an educational presentation that was created for staff members of a women's care division in a large Southern Colorado hospital that was in the midst of implementing SSC in the operating room. The theoretical framework for this independent study project utilized Bowlby and Ainsworth's Attachment Theory to explain the importance of implementing skin-to-skin contact between a mother and an infant, and Lewin's Change Theory to describe the implementation process to change practice.

### Skin-to-Skin Contact in the Operating Room Following Cesarean Birth

For centuries, babies have depended upon their mother's continuous, direct skin-to-skin contact (SSC) for their survival, and it has not been until the 20<sup>th</sup> century that industrialized societies have deviated from the instinctive norm and have separated babies and their mothers after birth (Moore, Anderson, Bergman, & Dowswell, 2012). The benefits of SSC between mothers and infants have been well documented throughout history. These benefits for infants include greater thermal regulation, increased glucose regulation, reduced stress as a result of decreased amounts of crying, and the ability to attach themselves to the breast for earlier breastfeeding. Mothers have increased levels of oxytocin released when babies are placed skin-to-skin, which leads to better attachment and bonding between mother and baby, along with quicker initiation of breastfeeding that ends in a longer duration (Phillips, 2013).

In 1991 the World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) developed a breastfeeding initiative called the Baby Friendly Health Initiative (BFHI) that was designed to protect, promote, and support worldwide breastfeeding. One of the steps in the BFHI is to place a baby and its mother skin-to-skin immediately after birth for at least one hour, if the mother is responsive and alert (World Health Organization & United Nations International Children's Emergency Fund [WHO & UNICEF], 2009). Unfortunately, despite all the evidence that SSC is best practice, the standard of practice has been to separate mothers and their babies immediately after birth to perform all of the routine tasks involved in a delivery, thus delaying all of the benefits involved in skin-to-skin and the first breastfeed (Moore et al., 2012). Many hospitals have been able to educate their staff and implement a change of practice in regards to SSC immediately after vaginal births, but many

barriers continue to exist for implementation in the operating rooms following a cesarean birth (Brady, Bulpitt, & Chiarelli, 2014).

According to the National Center for Health Statistics, the rate of cesarean births in the United States (US) in 2015 was thirty-two percent (Martin, Hamilton, & Osterman, 2015).

While the research suggests that baby should be placed skin-to-skin with mother immediately after birth for optimum outcomes for both mother and baby, this practice is not implemented consistently after cesarean births (Brady, Bulpitt, & Chiarelli, 2014). Thus, there is a large population that is being omitted from this best evidence-based practice of skin-to-skin, considering that cesarean birth rates make up nearly a third of the births in the US.

### **Purpose**

Although the benefits of SSC are evident, many hospitals have not implemented skin-to-skin between mother and baby in the operating room after a cesarean birth. Even though a mother may have an unexpected cesarean birth, both mother and baby still deserve to obtain the same benefits of SSC as they would if they had a vaginal birth (Phillips, 2013). The rationale or validity of the reasons for not implementing skin-to-skin in the operating room is not well demonstrated in the literature, thereby leaving a gap in evidence-based care and perhaps an opportunity to educate staff and change the practice standards in regards to cesarean births (Steinhauer & Clarke, 2015).

The intent of this literature review was to better understand the barriers that are preventing SSC between mothers and their infants immediately following a cesarean birth. The evidence gathered in this comprehensive literature review was critically reviewed and used to create an evidence-based staff educational lesson plan with this goal in mind. The difficulty of implementing change within practice is acknowledged. This difficulty may be addressed by first

establishing an understanding of the barriers that stand in the way of change, and to establish the level of research supporting the need for change. An educational lesson plan, established from evidenced-based research, helps medical doctors and staff implement best practice within their facilities.

### **Significance**

Currently, skin-to-skin contact after vaginal births is becoming standard of care within many hospitals due to the BFHI (WHO & UNICEF, 2009); implementing SSC after a normal vaginal birth is a significant progress in best practice but excluding a large population of patients with cesarean births is not meeting the standard of evidence-based practice. It is well established that SSC is a best practice between a full-term infant and their mother and has been implemented extensively after a normal vaginal delivery (World Health Organization [WHO], 1997). Despite all the evidence supporting SSC as best practice, the problem of opposition to implementation of SSC in the operating room for mothers and their babies after undergoing a cesarean birth continues. (Erlandsson, Dsilna, Fagerberg, & Christensson, 2007).

Nearly one third of childbearing families are not routinely benefiting from the benefits of SSC due to the current cesarean rates in the United States (Mangan & Mosher, 2012).

Identifying and examining the barriers that are standing in the way of SSC in the operating room is necessary to change practice. Educating the staff directly involved in caring for this patient population is paramount in overcoming the barriers preventing SSC in the operating room after cesarean births. The next section of this paper will present a detailed explanation of the two theories that underpinned the purpose of this project.

## Theoretical Framework

### Attachment Theory

The conceptual basis for the importance of SSC between mother and child can be explained through the work of John Bowlby and Mary Ainsworth and their Attachment Theory. Bowlby was the first to draw attention to the importance of the initial bonding between mother and infant, and the lifelong emotional, social and developmental impact that it can have on the infant (Young, 2013). Mary Ainsworth partnered with Bowlby to empirically test his ideas, where she built upon his theory by adding the idea that attachment allows the infant to form a secure base in which it can explore the world; mothers focusing on their infant's cues help to cultivate the attachment patterns between the two (Bretherton, 1992).

Bowlby (1958) believed in that infants have many physiological needs that need to be met, especially for food and warmth, that allow them to form an attachment to a human being. Most often these physiological needs are met primarily by the mother, and the infant learns that mother is the source of gratification. Bowlby also believed that infants have an innate need to suck and to relate themselves to the human breast, along with the innate need for human touch. Bowlby believed that primary object clinging, or the need for human touch, was fundamentally the most important in the child's psychological development. Bowlby (1960) claimed that separation anxiety is a primary anxiety which is not determined on what might happen, but rather is a psychological/biological reaction; there is no thought out rational or reason for the anxiety. Bowlby went on to explain that in the absence of clinging to their mother, the baby would go through three stages of protest, despair and detachment.

Ainsworth added to Bowlby's theories when she found a difference in those infants that were securely attached to their mothers and those that were not securely attached; noting that



those infants that were attached cried less and were more comfortable exploring their surroundings when their mothers were present (Bretherton, 1992). Attachment theory applies equally to both SSC between mothers and their infants whether they were born via vaginally or cesarean section and does not waiver based on the mode of delivery.

### **Lewin's Change Theory**

Adopting SSC in the operating room involves disrupting the routine practice of the staff, which is the unfreezing stage of Lewin's change model. It is important for the staff to support the proposed change before it is implemented for the change to be accepted and be successful. The newly implemented change can meet resistance from the staff who question the validity of the change, therefore it is important to present evidence-based educational sessions to the staff (Glenn, 2009).

The movement stage of Lewin's change model encompasses the implementation of the proposed change. The hospital allows for trial and error as the staff becomes accustomed to the implemented change becoming the new normal. The staff will become less resistant to the implemented change; more training and education may be needed to build upon the evidence-based practice (Manchester et al., 2014).

The final stage of Lewin's change model is the refreezing stage, which entails changing the culture within the hospital staff. It is important during this stage to set and keep the new standard operating procedures as personal can have the tendency to revert to their previous practices. Recharge educational sessions, along with open discussion forums about the implemented changes will foster acceptance within the hospital staff. This refreezing stage cements the change in practice as the new standard of practice, ultimately changing the culture (Glenn, 2009; Manchester et al., 2014).

### **Application of Theories**

The Attachment Theory laid out by Bowlby and Ainsworth, especially the infant behaviors of clinging to their mother and sucking, can be directly correlated with SSC and can solidify the importance of implementing this practice immediately after birth to begin that important attachment between infant-mother. Looking at how to implement SSC in the operating room, barriers must be investigated and addressed to change practice. Many of the addressed barriers in literature include staffing concerns, access to the mother by the anesthesia provider during surgery, safe positioning of the newborn with mother, access to infant while skin-to-skin, thermoregulation of baby, and an interruption in the routine procedures/practices performed on infant by nursing staff (Brady et al., 2014; Mangan & Mosher, 2012). Kurt Lewin's 3-step change model, which includes unfreezing, movement and refreezing, can provide a framework for the implementation of SSC in the operating room among staff (Manchester et al., 2014).

### **Process**

The comprehensive literature review was conducted over May 6, 2017 through May 15, 2017. The search used key words of cesarean section and kangaroo care, skin to skin contact and cesarean section, skin to skin contact after a cesarean to search Scopus, PubMed, CINAHL, and Cochrane Library data bases. Inclusion criteria for this search were articles that were current in the past ten years, directly addressed SSC with full-term, healthy newborns and their mother after a cesarean birth somewhere in the article and were in English; the articles that did not meet the inclusion criteria were excluded. This first phase of the literature review found 173 articles, and of those articles, twenty-four met the inclusion criteria after removing duplicates and reviewing the articles. The Agency for Healthcare Research and Quality (AHRQ) was searched

and one national guideline was pulled for the review. Two more articles were included after reviewing the reference lists of the selected articles.

The Melynk Level of Evidence method served as a framework to critically analyze the evidence and to categorize the level of the evidence as it includes both qualitative and quantitative studies within the evidence hierarchy (Thompson, 2017). Thus, one meta-analysis and one clinical guideline fit level I of evidence, seven studies fit into level II of evidence, one study fit into level IV of evidence, one study fits into level V of evidence, four studies fit into level VI of evidence, and twelve articles fit into level of VII of evidence. The next section will synthesize the literature found within this literature review.

### **Synthesis of Literature**

#### **Level I**

According to Moore, Anderson, Bergman, and Dowswell (2012), separation of infants and their mothers at birth is a common practice that disrupts initial infant-mother bonding and can have harmful lifelong consequences. This infant-mother separation can lead to delayed breastfeeding, even though as little as 50 minutes of SSC immediately after birth has shown that infants are eight times more likely to instinctively start breastfeeding; thus, increasing the overall success of continuing to breastfeed and increasing breastfeeding rates. This systematic review in the Cochrane Library conducted a review of thirty-four randomized controlled trials (RCT) that compared early SSC with standard hospital care. The authors focused their review on assessing “the early effects of early SSC on breastfeeding, physiological adaption, and behavior in healthy mother-newborn dyads” (p. 1). The inclusion criteria for the systematic review included RCT studies where early SSC between mothers and their healthy, full term (>37 weeks gestation) or late preterm (34-36 weeks gestation) infants was implemented within twenty-four hours after

birth and compared the early SSC to the controls that maintained the standard practice of infant/mother separation after birth. Fifty studies were excluded from the review, mainly because the investigators were unclear if the infants in the intervention group received early SSC with their mothers.

The authors of the systematic review concluded from their review that there was enough evidence to support SSC between infants and their mothers as the studies indicate that it has positive effects on breastfeeding, decreased crying which helps with blood glucose stability of the infant and helps with temperature stability of the infant. Out of all the included studies, the authors noted that there were many different outcomes, methods of measurement, timeframes for measurement, and a variety of newborn infant ages that left it very challenging to draw consistent conclusions. The authors recommend that there are more studies conducted that specifically include SSC following cesarean births, as the current studies are lacking this data. Also recommended was more documentation around participants, methods used, timing and selection of participants to allow the establishment of base data and deviations.

The Agency for Healthcare Research and Quality (AHRQ) released a clinical guideline in 2011 on cesarean sections, stating that “early skin-to-skin contact between the woman and her baby should be encouraged and facilitated because it improves maternal perceptions of the infant, mothering skills, maternal behavior, and breastfeeding outcomes, and reduces infant crying” (AHRQ, 2011, p. 9). The guideline also stated that mothers who undergo a cesarean section should be offered additional support to initiate breastfeeding as soon as possible after a cesarean birth to increase the likelihood that they will continue to breastfeed; SSC between mother and infant as soon as possible after a cesarean section helps improve breastfeeding outcomes.

## Level II

The level II evidence in this review includes seven studies that consist of randomized control trials that implement SSC in the operating room. Gouchon, Gregori, Picotto, Patrucco, Nangeroni and Di Giulio (2010) and Bieranvand, Valizadeh, Hosseinabadi, and Pournia (2014) conducted randomized control trials that specifically looked at the effects of infant temperature when SSC between infant and mother was implemented in the operating room. Gouchon et al. (2010) conducted an experimental, noninferiority adaptive trial that included thirty-four pairs of mothers and their newborn infants after an elective cesarean section, that were randomized either SSC or routine care; cesarean births that were full-term, 38 to 42 weeks gestation, with birth weights greater than 2,500 kg and one and five-minute Apgar scores, qualified for the study. Women who attended their regularly scheduled prenatal visits between 36 to 37 weeks gestation were informed about the study were consented; they were randomized using a computerized generated list.

Bieranvand et al. (2014) randomized ninety infant/mother dyads, with scheduled cesarean sections, to either the SSC group or the routine care group by choosing a random number under the table. Included in the study were those mothers with a singleton pregnancy, 38 to 42 weeks gestation, and an age range of 18 to 40 years old; infants needed to be full-term with their one and five-minute Apgar scores above seven. Those that were excluded from the study were mothers who had severe bleeding, gestational diabetes, hypertension, heart disease, and uterine atony; infants were excluded if they were high risk, had anomalies, or any other problems that lead to hospitalization. The studies by Beiranvand et al. (2014) and Gouchon et al. (2010) both concluded that there was not a significant drop in the infant's temperature when SSC was implemented after a cesarean section and that breastfeeding was successfully implemented.

Gregson, Meadows, Teakle, and Blacker (2016) conducted a randomized control trial that included 366 women, 187 in the control group and 182 in the study group, who were scheduled for an elective cesarean section and who were choosing to breastfeed their newborn infant. The inclusion criteria for the study included women who were having a scheduled cesarean section of a singleton term pregnancy between 37 to 42 weeks gestational age and had the desire to breastfeed. Those who expressed their wishes to feed their babies by formula, mothers who had postpartum complications, and infants known to have a major congenital condition were excluded from the study. The participants of the study were randomized using a computer-generated randomization, with the investigators blinded to the allocation. The primary outcomes of the study were measured by looking the breastfeeding rates at 48 hours, and the secondary outcomes of the study were measured by looking at the feeding methods of the infants 10 days, 48 hours, and at six weeks and correlated these results with the length of time SSC was performed. The study concluded that implementing SSC in the operating room is a simple intervention that showed a trend of increased breastfeeding rates.

There were two studies completed by Velandia, Matthisen, Uvnaas-Moberg, and Nissen (2010) and Velandia, Uvnaas-Moberg, and Nissen (2011) that looked at SSC between mothers or fathers and their infant after a cesarean birth. Velandia, Matthisen, et al. (2010) completed a randomized control trial that included 37 infants that were born to first time mothers and explored the differences of vocal interaction with a newborn that was placed skin-to-skin with either the mother or the father immediately following a scheduled. To qualify for the study, the women needed to be scheduled for a planned cesarean section, have had an uncomplicated, term pregnancy between 38 to 42 weeks gestation, and an Apgar Score of greater than seven at one minute of age and mothers who had not smoked cigarettes during the third trimester of

pregnancy. The only inclusion criteria for were their willingness to participate. The couples were randomized the day of the surgery, and the selected participants were informed as late as possible to avoid the smallest number of dropouts for the study as possible. The couples were either randomized SSC between the mother and infant or SSC between the father and the infant; the parent not chosen for SSC with their infant served as the control group. Data was collected through video and sound recordings that began immediately after birth where the infant and parental behaviors were analyzed. The study found that the immediate SSC with either mother or father after a cesarean birth promoted vocal interaction between the infant and parent.

Velandia, Uvnasa-Moberg, et al. (2011) completed a randomized control trial of thirty-seven infants and one of their parents, which compared the breast-seeking and crying behavior between male and female infants when SSC was implemented between either their father or their mother after a Cesarean section. The study also looked at the when the first breastfeed occurred between mother and infant, and it also compared the interactions between father and infant compared to the interactions between mother and infant. To be included in the study, the first-time mothers had to have an uncomplicated, 38 to 32-week term pregnancy with an Apgar Score of at least a seven, at one minute. Mothers who smoked during the third trimester were excluded. The only inclusion criteria for the fathers were that they were willing to participate. The newborn infants, twenty girls and seventeen boys, were randomized to the group that performed SSC with their mother or their father for the five to thirty-minute period immediately after a cesarean birth. The randomized selection was revealed the day of the scheduled cesarean birth by opening an opaque envelope that contained an identity number and whether the father or mother would have SSC with the newborn infant. The study found that SSC should be implemented between the mother and their newborn infant as soon as possible following a

scheduled cesarean as the first breastfeeding occurred much earlier than when the infant had SSC with the mother compared to SSC with the father. When the mother is unable to perform SSC with the newborn infant following the cesarean section, it is beneficial to place the newborn SSC with the father for parental interaction.

Even though these studies also included SSC with the fathers after a cesarean delivery, both studies found that immediate SSC contact after a cesarean delivery with mother or father should be encouraged as it promotes vocal interaction. Skin-to-skin contact after a cesarean section provided an opportunity for infants to interact with their parents. When the mother is unable to provide SSC with the infant after a cesarean birth, the infants in these studies benefited from SSC with the father until the mother is available.

Nolan and Lawrence (2009) completed a RCT pilot study with fifty women participants where a nursing protocol was introduced with the intention that less time would be spent apart between mother and baby after a cesarean birth. The inclusion criteria included women with a term pregnancy, greater than 37 weeks gestation, and were scheduled for a planned, repeat cesarean delivery. The exclusion criteria included those with pre-existing conditions or known potential complications. When the mothers arrived for their planned cesarean they were notified of the study. These women interested in participating provided consent and were randomized by flipping of a coin to be placed in the control group or the experimental group. The treatment group consisted of the implementation of SSC in the operating room, which allowed for mothers and their infants to have physical contact sooner and initiation of breastfeeding sooner than those in the group where the infants were separated from their mothers. The infants who had SSC in the operating room had lower respiratory rates and better thermoregulation compare to those infants who did not receive SSC. Nolan and Lawrence (2009) concluded that more testing is



recommended for all the positive maternal-infant outcomes to be recognized and implementing the SSC protocol shows a promise for these positive outcomes.

Armbrust, Hinkson, von Weizsacker, and Henrich (2016) conducted a well-designed randomized control trial with the purpose of looking at the safety and patient's delivery experience when early skin-to-skin contact between mothers and their infants was implemented in the operating room during scheduled, primary cesarean sections. Participants were blinded as to the group to which they were randomized to until the day of the surgery. The study included 205 randomized patients that met the inclusion criteria of meeting the requirements of a primary cesarean section with a gestational age greater than thirty-seven weeks, patients without high-risk conditions, and no known fetal anomalies. The exclusion criteria for patients included (a) those patients who changed their minds before surgery, (b) patients with heavy bleeding or unexpected complications, (c) infants with breech presentation or difficulties in lifting the infant out, and (d) infants with fetal anomalies. Primary outcome measures of the study were the birth experience and satisfaction of the parents. The secondary outcomes were measured through the APGAR Scores, blood loss, and perioperative complications. The study found that early SSC between mother and infant resulted in higher satisfaction with a cesarean birth compared to those who had a traditional cesarean section where SSC was not performed. The study also found that there were no differences in the infant's APGAR scores and NICU admissions between the traditional cesarean section group and the group where early SSC was implemented, making early SSC between mother and infant a safe option.

#### **Level IV**

Posthuma, Korteweg, van der Ploeg, de Boer, Buiters, and van der Ham (2017) looked at the risks and benefits of SSC during a cesarean section through a retrospective cohort study. A

multidisciplinary team skin-to-skin cesarean section (SSCS) protocol was developed and implemented, including 650 women as participants in the study; 285 women were included in the SSCS group and 285 women were included in the traditional cesarean section where the infant was not placed skin-to-skin with the mother during the procedure. The data for the study was collected through the patient's electronic medical record. Those patients that were excluded from the study were those mothers with preterm pregnancies less than 37 weeks gestation, requiring emergency cesarean sections, or cesarean sections requiring general anesthesia. The study concluded that there were no adverse outcomes related to mother and infant when SSCS was implemented. The study also showed increased satisfaction among the parents, the recovery time of the mother in the post anesthesia care unit (PACU) was decreased, there were less infant admissions to the pediatric unit for infection, and mothers experienced an overall shorter hospital stay.

#### **Level V**

Stevens, Schmied, Burns, and Dahlen (2014) provided a literature review in which the purpose was “to evaluate evidence on the facilitation of immediate (within minutes) or early (within 1 h) skin-to-skin contact following Caesarean section for healthy mothers and their healthy newborns, and identify facilitators, barriers, and associated maternal and newborn outcomes” (p. 456). The authors of this review did not limit the review to RCTs and included qualitative studies and quality improvement projects. Through Stevens et al. (2014) review of the seven included articles, they concluded that SSC in the operating room can be safely and immediately implemented with the help of the multidisciplinary team. The authors also concluded that “there is some evidence, albeit minimal, demonstrating an increase in maternal and newborn emotional well-being, increase in parent/newborn communication, reduction in

maternal pain/anxiety, stabilised physiological stability for the mother and newborn and improved breastfeeding outcomes with immediate or early SSC following a Caesarean section” (p. 469).

### **Level VI**

Frederick, Busen, Engebretson, and Schneider (2015) focused their qualitative ethnographic study on the mother’s experience with SSC immediately following a cesarean birth. Eleven women participated in this study, with data collected through observation and surveys. The women were between the ages of twenty-three and thirty-eight, a gestational age of 39.1 weeks to 40.2 weeks and delivered their infants via cesarean section. Eight of the participants were scheduled cesarean sections, two were first time mothers who had delivery complications that resulted in a cesarean section, and one required a cesarean section due to breech presentation of the infant. Along with mother’s reports that SSC made them feel more at ease with breastfeeding and more empowered during their cesarean section, these participants reported feeling more connectedness to their infant as soon as the infant was placed SSC in the operating room.

Koopman, Callaghan-Koru, Alaofin, Argani, and Farzin (2016) conducted an exploratory qualitative study that used semi-structured interviews to gain more of an understanding of key factors, from eleven different clinician’s perspectives, which influence uninterrupted skin-to-skin contact between a mother and their infant after both a cesarean section and a vaginal birth. Staff members who agreed to participate were included in the study and consisted of five labor and delivery nurses, four neonatal intensive care nurses, and two medical doctors. The study found that the lack of clear protocols and failing to properly educate clinicians when implementing early SSC resulted in suboptimal implementation. The study also found that SSC in the

operating room was more difficult to achieve due to the inadequate staffing and competing tasks of the operating room staff.

Sampaio, Bousquat, and Barros (2016) conducted a cross-sectional observational study of 107 participants, in a hospital in Northwest Brazil and the prevalence of compliance this hospital had in initiating the fourth step of the Baby-Friendly Hospital Initiative. The fourth step involved an initiative of putting babies in SSC with their mothers immediately following birth for at least a half an hour. Face-to-face interviews were conducted using a structured questionnaire called the LimeSurvey™ software to estimate the prevalence of SSC immediately after birth, with the interviews occurring between 12 and 36 hours after birth. Those who were excluded from the study included: (1) women who had complications postnatally that hindered the ability to perform SSC with their infants, (2) infants under 1,500 grams, (3) infants who were less than 34 weeks gestation using the Capurro method, (4) infants with APGAR scores below seven at five minutes, (5) mothers with HIV or a positive HIV serology in their medical records, and (6) mothers or infants that had to immediately be transferred to the intensive care unit. This study concluded that this hospital had a high number of non-compliance in initiating SSC in the operating room post cesarean sections. Even though the study by Sampaio et al. (2016) was conducted in Brazil, the authors also mentioned that the United States still has issues with compliance of step number four of the BFHI.

Stevens, Schmied, Burns, and Dahlen (2016) conducted an ethnographic study to provide more insight as to what facilitates and what hinders SSC in the operating room and recovery. The study included twenty-one women with uncomplicated pregnancies who were planning a repeat cesarean section, aged 18-40 years old, with a singleton gestation and planned on breastfeeding. Twenty-six support people, more than 125 staff members directly involved in

their care, and forty-three more staff members were also included in focus groups and interviews. Data was collected by videotaping maternal participants that focused on documenting the contact between the infant and mother for up to two hours after a cesarean section and by review of the field notes that had been documented in the operating and recovery rooms. Audio recorded interviews were conducted at the six-week postpartum visit and through staff focus groups. The study concluded that providing SSC in the operating room can be challenging, as it can be difficult to provide the emotional and social care in a medically complex environment. The findings indicate that SSC can be successfully implanted in the operating room by making adjustment to the existing care protocols by educating staff and patients, creating and implementing a specific SSC policy, addressing staffing issues, improved communication between staff members, attention to time constraints, and making adjustment to equipment utilized in SSC.

### **Level VII**

There were twelve articles included in this literature review in the level VII of evidence, and consist of expert opinions, quality improvement projects, and evidence-based projects to name a few. Many of the studies referenced in these articles have been synthesized in the previous levels of evidence within this paper. The world has recognized the benefits of breastfeeding, with the WHO and Baby-Friendly USA encouraging all hospitals to implement the Ten Steps to Successful Breastfeeding to help encourage breastfeeding for all mothers. Skin-to-skin contact between mothers and their infants immediately after birth has been linked to mothers successfully breastfeeding their infants (Brady, Bulpitt, & Chiarelli, 2014; Schorn, Moore, Spetalnick, & Morad, 2015). Women who experienced SSC after their cesarean birth reported that they had greater success with breastfeeding, had less pain, and had higher

satisfaction. Mothers contributed their success with breastfeeding to feeling more calm and relaxed while their infant was skin-to-skin (Moran-Peters, Zaunders, Goldman, Baierlein, & Smith, 2014; Sundin & Mazac, 2015).

This literature search found that many institutions and hospitals implemented quality improvement projects to increase their SSC after birth, specifically in the operating room after a cesarean section (Brady et al., 2014; de Alba-Ramero et al., 2014; Grassley & Jones, 2014; Hubbard & Gattman, 2017; Hung & Berg, 2011; Moran-Peters et al., 2014; Schneider et al., 2017; Schorn et al., 2015; Sundin & Mazac, 2015; Stone et al., 2014). Prior to implementing SSC in the operating room, facilities reviewed the evidence associated with the benefits of SSC and took on the task of creating protocols for staff to follow for safe implementation following a cesarean birth. The importance of education during the implementation process was a clear theme identified through review of Level VII evidence. Education of staff, mothers, father/support persons on monitoring the infant's breathing while skin-to-skin to make sure infant does not have any complications (Brady et al., 2014; de Alba-Ramero et al., 2014; Grassley & Jones, 2014; Hubbard & Gattman, 2017; Hung & Berg, 2011; Moran-Peters et al., 2014; Schneider et al., 2017; Schorn et al., 2015; Sundin & Mazac, 2015; Stone et al., 2014). The nurse assigned to care for the infant should remain close to mother, infant and support person to provide ongoing professional assessments of the infant (de Alba-Ramero et al., 2014; Mangan & Mosher, 2012).

This review of Level VII evidence also uncovered barriers of implementing SSC in the operating room. Some of the obstacles reported in the literature were staffing assignments, staff reluctance in regards to the safety and thermoregulation of the infant, and staff reluctance to change (de Alba-Ramero et al., 2014; Hubbard & Gattman, 2017; Hung & Berg, 2011). The

evidence also emphasized that nurses have the unique opportunity to lead the way in changing practice and should advocate for SSC in the operating room within their facilities (Hung & Berg, 2011; Schneider, Crenshaw & Gilder, 2017). However, Dabrowski (2007) found that even though nurses knew the benefits of SSC for the mother and infant in the operating room, along with increased maternal satisfaction, many nurses remained resistant to improving outcomes through implementation of SSC.

One article provided encouraging recommendations to implement SSC in the operating room through creation of proper protocols, training of the interdisciplinary team, good team communication, and changing practice to support the evidence of what is best for mother and infant (Hubbard & Gattman, 2017). Stone, Prater, and Spencer (2014) used simulation as a part of their implementation process as it allowed for staff members to practice SSC in a safe environment. The simulation environment allowed for all members of the interdisciplinary team to practice their roles and responsibility. The staff were able to take ownership of this change in practice. When Grassley and Jones (2014) implemented their quality improvement, evidence-based practice project of SSC in the operating room at an inpatient birth center, they found SSC rates in cesarean birth increase 80% over two and one-half months. The interdisciplinary team made this practice change a normalcy with the cesarean sections rather than a rarity.

### **Summary of Evidence**

This review of literature identified key information related to implementation of skin-to-skin contact between mother and infant in the operating room post-cesarean section. Separating infants and their mothers immediately after birth is currently common practice and has led to delayed breastfeeding. Skin-to-skin contact between infants and their mothers immediately after delivery, including cesarean sections, has been proven to have positive effects on breastfeeding

and blood glucose and temperature stability, making it a recommended practice (Moore et al., 2012). The evidence indicated that breastfeeding increased in duration when skin-to-skin contact had been implemented in the operating room. The recommendation is that SSC should be implemented as soon as possible after delivery to allow for the first breastfeeding session (Gregson et al, 2016; Velandia, Uvnasa-Moberg, et al., 2012). Mothers who had SSC implemented in the operating room had a much higher satisfaction with their cesarean births and recovery time was decreased, resulting in shorter hospital stays. They also felt more at ease about breastfeeding. (Armbrust et al., 2016; Frederick et al., 2015; Posthuma et al., 2017).

## **Discussion**

### **Interpretation**

Placing an infant skin-to-skin with their mother immediately after birth has proven to be best practice as evidenced by this review of literature, one that has been lacking in hospitals around the United States after cesarean section deliveries. Much of the literature focused on experiences of the mothers and of the providers when skin-to-skin contact was implemented in the operating room. The literature illustrated that even though SSC in the operating room was important, this practice was met with many challenges and barriers in its implementation (Hung & Berg, 2011; Mangan & Mosher, 2012). One of the challenges that created a barrier to implementation was the lack of knowledge on the benefits and importance of SSC by both the providers and parents (Hubbard & Gattman, 2017; Hung & Berg, 2011). To make practice changes based on the evidence found within this literature review, it is important to tackle the barriers that exist to address them. To implement SSC in the operating room as a standard of care, educating providers, staff members, and parents on the importance of SSC is essential Hubbard & Gattman (2017). Furthermore, the facilities must address inadequate staffing and



create procedural policies. (Koopman, Callaghan-Koru, Alaofin, Argani, & Farzin, 2016; Stevens, Schmied, Burns, & Dahlen, 2016).

### **Outcome/Dissemination**

This project sought to apply the theoretical framework of Lewin's Change Theory and the evidence found in the literature to an effort to create change in a Southern Colorado hospital to meet the requirements for Baby-Friendly accreditation. The unfreezing stage of skin-to-skin contact in the operating room begins with staff acknowledging the importance of SSC and the benefits provided for mother and infant. Presenting the evidence of SSC in the operating room found in the literature to the staff and educating them on the benefits is important to the unfreezing stage, thereby preparing for the movement stage. Unfortunately, the staff members were not properly prepared and educated on SSC prior to the initial attempt at implementation in the operating room. Therefore, there has been a lack of consistency of staff members educating patients on the benefits of SSC in the operating room and implementation of SSC in the operating room.

The hospital just received feedback from the Baby-Friendly on-site assessment that had recently been completed in February 2018. The visit revealed that the hospital was not fully compliant with SSC in the operating room/post anesthesia care unit, and the Baby-Friendly assessment committee called for a quality improvement project to be implemented before the hospital would receive its Baby-Friendly designation. The details regarding the quality improvement project have not yet been revealed to the hospital and will be addressed with management soon. Therefore, this project's aim is to present the supporting evidence behind skin-to-skin-contact in the operating room to educate staff members through a presentation at the

April 24, 2018, staff meeting of a women's division in a large hospital in which SSC in the operating room has been implemented throughout the past year.

The staff members of the Women's Division will be educated on Bowlby and Ainsworth's Attachment Theory and the importance it has on the initial bond between mother and infant through a PowerPoint slideshow presentation. Infants feel attached, secure, and cry less when they are with their mothers and have their physiological needs of food and warmth met when they are placed skin-to-skin with their mothers (Bowlby, 1958; Bretherton, 1992). Placing an infant skin-to-skin with its mother in the operating room helps to initiate and promote attachment between infants and their mothers. Promoting the importance of SSC and the attachment it forms to staff members helps staff members to accept this practice through the affective domain of learning.

The movement stage of SSC in the operating room involved members of the interdisciplinary team implementing SSC in the operating room; this is a time for trial and error for staff members. During this movement stage, it is important to take into consideration the feedback from the interdisciplinary team as to what was successful and what need to be changed. Addressing the barriers and obstacles through more education and training will help the staff become less resistant, thereby allowing them to move towards the refreezing stage. Unfortunately, the current result of not being properly prepared and educated before implementation has left staff members stuck in the movement phase of Lewin's Change Theory. The planned presentation will provide staff with more education and training through this PowerPoint presentation and through a quality improvement project laid out by Baby-Friendly. This will be an important step in moving the staff towards the refreezing stage (Manchester et al., 2014). In addition, it may be beneficial to plan a simulation lab for the interdisciplinary team to

practice the steps of implementation of skin-to-skin in the operating room, along with establishing a pilot protocol after the simulation based on the simulations observations and notes (Stone, Prater, & Spencer, 2014). Revisiting the evidence of successful outcomes of the implementation of SSC in vaginal births can also help motivate staff to move towards the implementation of SSC in the operating room (Glenn, 2009; Manchester et al., 2014).

The refreezing stage encompasses incorporating SSC in the operating room as the new standard of practice within the unit, which ultimately changes the culture within the hospital (Glenn, 2009; Manchester et al., 2014; Stone et al., 2014). To advance to the refreezing stage, staff must consistently implement SSC between mother and infant in the operating room meeting the expectations of the Baby-Friendly requirements to become accredited as such. This hospital has made strides to reach the refreezing stage but will continue to move through the movement stage until all of the education and quality improvement projects are implemented to make SSC in the operating room between mother and infant a normal practice within the hospital.

### **Implications for Nursing**

#### **Practice.**

Nurses have a unique opportunity to change the way infants are cared for immediately after birth (Dabrowski, 2007). Instead of completing the routine practices of caring for an infant under a radiant warmer, nurses and other members of the health care team can change practice and care for the infant while it is skin-to-skin with its mother immediately after birth (Hung & Berg, 2011). Cesarean births can pose challenges to implementing skin-to-skin contact, and it is important for nurses to collaborate with the interprofessional team to ensure that skin-to-skin contact between mother and infant can be initiated and continued until the end of recovery (Dabrowski, 2007).

**Education.**

As more hospitals around the United States prepare for the implementation of skin-to-skin contact in the operating room, a strong recommendation would be to make sure that thorough, evidence-based educational sessions be conducted with staff in preparation for the change. Education across the entire interdisciplinary team is necessary for facilitating change. Educating new staff members on the importance of breastfeeding and SSC in the operating room needs to begin at orientation to stress SSC as the standard of care. The importance of SSC the benefits to mother and infant can also begin in academia, preparing the way for best-practice. Grassley and Jones (2014) discussed how facilitation of staff preparation at their facility began with a group of nursing students that developed and presented a PowerPoint presentation and a companion video to present to the staff. This is one example of a way that nursing students in academia can be involved in implementing change with SSC in the operating room.

Patient education cannot be forgotten as it plays a crucial role in when working to patients to implement their plan of care during their hospital stay. Education on SSC can be offered through childbirth education class, prenatal breastfeeding class, baby care class, and through prenatal tours. SSC information should also be included in printed education materials and education videos that help to promote SSC as a standard of care (Brady, Bulpitt, & Chiarelli, 2014).

**Policy.**

Skin-to-skin contact in the operating room should be implemented once a specific policy on the practice is written for the interdisciplinary staff to follow (Mangan & Mosher, 2012). Once the policy is written and implemented by a facility, it is important for a member of the

management team to make frequent rounds to answer questions and to post written communication in areas where clarification is needed (de Alba Romero et al., 2014).

### **Research.**

There was sufficient evidence found throughout this literature search to support skin-to-skin contact between mother and baby in the operating room among healthy infants. The studies that were conducted on the implementation of skin-to-skin contact between mother and infant in the operating room may have limitations as they consisted of many variations in the measurement of outcomes, methods used within the studies, and the time frames of the studies varied. Future studies designed with more standardized parameters would help to solidify the exact benefits of skin-to-skin contact after cesarean births and help to reassure providers of the safety of the implementation. It would also be beneficial for more research to be conducted on skin-to-skin contact of infants who are admitted to the NICU to look at the benefits and risks involved when SSC is implemented on infants who fall outside the healthy, newborn classification.

### **Summary/Conclusion**

Skin-to-skin contact between a mother and their infant has proven great deal of evidence toward being a best practice, providing benefits to both mother and infant; and has become standard of care within many hospitals following a normal vaginal birth (WHO & UNICEF, 2009). When applying the theoretical framework of Bowlby and Ainsworth's Attachment Theory to SSC, placing an infant skin-to-skin with their mother initiates an important attachment bond that has lifelong emotional, social and developmental implications on an infant (Young, 2013). Skin-to-skin contact also allows for breastfeeding to be initiated sooner, which aligns with Bowlby's (1958) belief that infants have an innate need for touch and relate themselves to the

human breast. The review of literature sought out to explain the rationale as to why skin-to-skin contact in the operating room was not routinely implemented and discovered that there was an opportunity to educate staff members on the implementation of SSC in the operating room after cesarean births using Lewin's Change Theory.

The literature revealed key information related to the barriers that exist in the implementation of skin-to-skin contact in the operating room following a cesarean birth, and that separation of mother and infant is still common practice after cesarean births that can lead to delayed breastfeeding (Mangan & Mosher, 2012). Some of the barriers identified in the literature included: staffing assignments, staff reluctance to change, and staff reluctance due to the potential safety issues regarding the infant and thermoregulation (de Alba-Ramero et al., 2014; Hung & Berg, 2011). The importance of educating staff was a clear theme that was presented throughout the literature when skin-to-skin contact was implemented in the operating room. Education of staff members, clear communication, and the creation of proper SSC protocols can help to provide a successful change in practice (Hubbard & Gattman, 2017).

Through Lewin's Change Theory, this Independent Study project has sought to change the attitudes, perceptions, and knowledge of skin-to-skin contact of staff members at a women's health division of a large hospital during efforts toward implementing skin-to-skin contact in the operating room. The intention of this project was to promote acceptance of skin-to-skin contact in the operating room at this Southern Colorado Hospital, and to promote acceptance of skin-to-skin contact in the operating room in hospitals throughout the United States.

As more and more hospitals implement skin-to-skin contact within the operating room after cesarean births, the strength of evidence underpinning this practice will support it as a new normal within the nursing profession. This review of literature found that skin-to-skin contact

between mothers and their infants following a cesarean section to be safe and highly desirable for mothers and their infants. The studies within this review prove that the implementation of SSC in the operating room is possible and can be successful if the barriers are identified and overcome. Nurse education is essential to overcome the barriers and implement change. The efforts to inform and educate must not stop with nursing staff; rather, it is important for the interdisciplinary team to gain the knowledge of SSC between the mother and infant in the operating room and to be motivated to develop a new standard of practice and promote positive health outcomes for mothers and their infants.

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## Appendix A

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnyk)
Agency for Healthcare Research and Quality. (2011). <i>Caesarean section</i> . Retrieved November 26, 2016	The guideline was developed to ensure consistent quality of care for women who have had caesarean sections in the past and are now pregnant again, have a clinical indication for caesarean section, or are considering a c/s when there is no other indication.	Clinical Guideline	N/A	Search of Electronic Databases for:  Meta-Analysis  Review of published meta-analyses  Systematic review with evidence tables	Early SSC between mother and infant should be encouraged and facilitated after a c/s because it improves maternal perceptions of the infant, mothering skills, maternal behavior, breastfeeding outcomes, and reduces infant crying	Strengths: Methods used to analyze evidence for guideline were through meta-analysis, review of published meta-analyses, and systematic review with evidence tables	Level I

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Moore, E. R., Anderson, G. C., Bergman, N., & Dowswell, T. (2012). Early skin-to-skin contact for mothers and their healthy newborn infants. <i>Cochrane Database of Systematic Reviews</i> , 1-84.	To assess the effects of early SSC on breastfeeding, physiological adaptation, and behavior in healthy mother-newborn dyads.	Systematic review of RCT comparing early SSC with usual hospital care	34 RCTs: included 2177 mother-newborn dyads	Authors independently assessed trial quality and extracted data. The authors of the studies were contacted if additional information was needed.	<p>Statistically significant positive effect of early SSC on breastfeeding at one to four months postbirth</p> <p>SSC increased breastfeeding duration, but the results were just shy of statistical significance (P=0.06)</p> <p>Late preterm infants had better cardio-respiratory stability with early SSC</p> <p>Blood glucose 75 to 90 minutes following the birth was significantly higher in SSC</p>	Limitations: Quality of the RCTs was mixed with the overall quality of reporting on study methods was poor.	Level I

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Armbrust, R., Hinkson, L., von Weizsacker, K., & Henrich, W. (2016). The Charite cesarean birth: A family orientated approach of cesarean section. <i>The Journal of Maternal-Fetal &amp; Neonatal Medicine</i> , 29(1), 163-168.	To evaluate the safety and patient's delivery experience of the Charite Birth, a modified cesarean section. Parents are actively integrated in the delivery process by direct visualization of the birth, cutting the umbilical cord and early skin-to-skin contact.	Prospectively Randomized Control Trial	205 randomized patients	Randomized process based on a single sequence of randomized assignments, double blinded. Parameters of perinatal outcome for both mother and infant were assessed using modified Likert-Scales and a standardized questionnaire.	Birth experiences were rated higher in the CCB group compared to a classical cesarean section ( $p < 0.05$ ). There were no significant differences between APGAR Scores need for admission to the NICU. Perioperative blood loss and cardiovascular disorders did not differ between the two groups. Early SSC was achieved in the 72% of cases with higher rates of breastfeeding in the CCB group.	Strength: First prospectively, randomized controlled evaluation of CCB's effects. High rate of SSC and no major or minor complications during the process.  Limitations: Patients with the need for emergency CS were not included.  Likert-Scales were not completely standardized.	Level II



Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Beirandvand, S., Valizadeh, F., Hosseinabadi, R., & Pournia, Y. (2014). The effects of skin-to-skin contact on temperature and breastfeeding successfulness in full-term newborns after cesarean delivery. <i>International Journal of Pediatrics</i> , 2014, 1-7.	Compare mothers' and infant's temperatures after delivering via cesarean section	Randomized Clinical Trial	90 infant/mothers' dyads delivered via cesarean section	46 dyads were randomized to SSC and 44 were randomized to routine care. In the experimental group, SSC was performed for one hour and in the routine group the infant was dressed and put in the cot according to hospital routine care. The newborns' mothers' temperatures in both groups were taken at half-hour intervals. The data was analyzed using descriptive statistics (chi-square and t-tests)	<p>The mean scores of the newborns' temperatures immediately after SSC, half and hour, and one hour after the intervention did not show statistically significant differences between the two groups.</p> <p>The mean scores of the infants' breastfeeding assessment in SSC and routine care groups did not show significant differences.</p>	Strengths: Higher rate of breastfeeding successfulness in the SSC group compared to the routine group	Level II

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Gouchon, S., Gregori, D., Picotto, A., Patrucco, G., Nangeroni, M., & Di Giulio, P. (2010). Skin-to-skin contact after cesarean delivery. <i>Nursing Research</i> , 59(2), 78-84.	To compare mothers' and newborns' temperatures after cesarean delivery when SSC was implemented with those when routine care was practiced in the 2 hours beginning when the mother returned from the operating room.	Experimental, noninferiority adaptive trial; randomized	34 pairs of mothers and newborns, after an elective cesarean delivery	If inclusion criteria were met, the women were approached around 36-37 weeks, at their scheduled checkup, the week before their scheduled CS. Randomized using opaque, sealed envelopes that were generated from a computer-generated randomized list. The day of the surgery, the envelopes were opened.	No difference in temperature between SSC group and control group	Strengths: Study confirms feasibility of SSC after cesarean births  Limitation: Operating rooms are not usually close to OB department, so SSC is not always possible immediately after delivery.	Level II

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Gregson, S., Meadows, J., Teakle, P., & Blacker, J. (2016). Skin-to-skin contact after elective caesarean section: Investigating the effect on breastfeeding rates. <i>British Journal of Midwifery</i> , 24(1), 18-25.	To determine whether kangaroo care (skin-to-skin contact) between mother and baby in the operating theatre can affect breastfeeding outcomes following an elective cesarean section.	Randomized Control Trial	366 women (182 in study group, 187 in control group) who chose to breastfeed their baby b	<p>Participants were randomly allocated to one of the two groups: immediate SSC in the operating room following birth or delaying SSC until the operating was completed.</p> <p>The primary outcome was breastfeeding rates at 48 hours. Secondary outcomes were feeding methods at 10 days and 6 weeks following birth, admission to the NICU, length of time for which SSC was performed for the first episode after birth and during the first 24 hours, and women's experiences.</p>	5% increase in breastfeeding rates at 48 hours and 7% at 6 weeks; this is not significantly significant (p=0.25 and 0.44). There was a significant correlation between the length of time for which SSC was performed and continuing to breast feed at 48 hours (p=0.04)	<p>Limitations: 'Contamination' of the control group may have had a significant impact on feeding outcomes by reducing the differences seen between both groups. Most participants in the control group performed much longer periods of SSC with their babies than expected.</p> <p>Strengths: Demonstrated the power of a research project for effecting change. SSC can be introduced into the operating room with relative ease, provided adequate training and supervision of staff is carried out</p>	Level II

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Nolan, A., & Lawrence, C. (2009). A pilot study of a nursing intervention protocol to minimize maternal-infant separation after cesarean birth. <i>Journal of Obstetric, Gynecologic, &amp; Neonatal Nursing</i> , 38, 430-442.	To pilot test a standardized intraoperative and postoperative nursing intervention protocol to minimize maternal-infant separation after cesarean.	Randomized-controlled trial	50 women having a live, term, singleton, repeat cesarean delivery and their newborns	Mothers were randomly assigned to the NIMS or control group by a coin flip	The intervention group experienced earlier first physical contact and feedings and a longer interval until the first bath compared to the control group. Differences were found between treatment groups for infant temperatures and respiratory rates. Three infants in the control group experienced suboptimal temperatures. Infants in the intervention group had significantly higher salivary cortisol levels but were within the normal upper level range.	Limitations: Infants in the SSC weighed significantly more than those in the control group.  Strengths: Nursing staff was critical to the NIMS protocol administration.	Level II

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Velandia, M., Matthisen, A. S., Uvnas-Moberg, K., & Nissen, E. (2010). Onset of vocal interaction between parents and newborns in skin-to-skin contact immediately after elective cesarean section. <i>BIRTH: Issues in Perinatal Care</i> , 37(3), 192-201.	Explore and compare parent-newborn vocal interaction when the infant is placed in skin-to-skin contact either with the mother or the father immediately after a planned cesarean section	Randomized Control Trail	37 healthy infants born to primiparas	Participants were randomized to 30 minutes of SSC either with fathers or mothers after an initial 5 minutes of SSC with the mothers after birth. The newborns' and parents' vocal interaction were recorded on a videotape and audiotape.	Newborns' soliciting increased over time. Both the fathers and mothers in SSC communicated more vocally with the newborn than did fathers and mothers without SSC contact. Fathers in SSC also communicated more with the mother and performed more soliciting responses than the control fathers. Infants in SSC with their fathers cried significantly less than those in SSC with mothers and sifted to a relaxed state earlier than in SSC with their mothers	Strengths: Identified and described an additional component of the inborn prefeeding behavior of vocal interaction with the parents.  Limitations: Small sample study. Despite the small sample study, significant differences were found.	Level II

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnyk)
Velandia, M., Uvnas-Moberg, K., & Nissen, E. (2011). Sex differences in newborn interaction with mother or father during skin-to-skin contact after cesarean section. <i>Acta Paediatrica</i> , 101, 360-367.	To investigate difference between the breast-seeking and crying behavior of girls and boys in skin-to-skin contact with their mother or their father after Caesarean section as well as the point in time for the first breastfeeding and compare mothers' and fathers' interactive behavior with their newborn	Randomized Control Trial	Twenty girls and 17 boys and their first-time mothers and fathers	Participants were randomized to 25 minutes of SSC with one or the other parent immediately after birth. The interaction was videotaped.	<p>Infants started to breastfeed significantly earlier with their mothers compared to being SSC with their fathers during the first 5-30 minutes.</p> <p>Girls cried more than boys when in SSC with either mother or father.</p> <p>Mothers used more touching behavior toward their infant than the father.</p> <p>Mothers touched girls less than boys.</p> <p>Fathers direct less speech towards girls compared with boys</p> <p>Girls started rooting earlier than boys</p>	<p>Strengths: Unique findings were reported in this study.</p> <p>Strict inclusion criteria limiting variance in background, obstetrical data, infant status and birthweight.</p> <p>All comparisons were planned with no post hoc comparisons were made.</p> <p>Limitations: Small sample size.</p> <p>Some results did not reach statistical significant differences</p>	Level II

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnyk)
Posthuma, S., Korteweg, van der Ploeg, J. M., de Boer, H. D., & van der Ham, D. P. (2017). Risks and benefits of the skin-to-skin cesarean section: A retrospective cohort study. <i>The Journal of Maternal-Fetal &amp; Neonatal Medicine</i> , 30(2), 159-163.	Comparing maternal and neonatal outcomes after a conventional cesarean section versus a SSC cesarean section	Retrospective cohort study	285 women in the SSC group and 365 women in the conventional cesarean section group	Patient charts of 650 women with cesarean sections were analyzed.  T-test and continuous data analyzed with chi-square test and presented as CI and p value	No statistical differences in surgical site infections or any other maternal outcomes between the SSC group and the conventional group.  Fewer infants in SSC were admitted to pediatric unit and fewer infants had suspected neonatal infections	Strengths: No increased adverse maternal and infant outcomes reported in SSC group. Increased parental satisfaction, shorter maternal recovery time in the PACU, shorter maternal hospital stays, and fewer infants admitted to pediatric unit for suspected infection.  Limitations: Information bias could be present due limited information by using electronic patient files and hospital paper charts in this retrospective study.  Sample size may have been too small to find differences in surgical site infections.	Level IV

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Stevens, J., Schmied, V., Burns, E., & Dahlen, H. (2014). Immediate or early skin-to-skin contact after a caesarean section: A review of the literature. <i>Maternal and Child Nutrition, 10</i> , 456-473.	Evaluate evidence on the facilitation of immediate (within minutes) or early (within 1 hour) skin-to-skin contact following Caesarean section for healthy mothers and their healthy newborn infants	Literature review	Seven articles were chosen for this review	A range of electronic data bases were search for articles published in English and peer reviewed from January 2003 and October 2013. Search included the search terms of skin-to-skin and birth, skin-to-skin and Caesarean/Cesarean, skin-to-skin and breastfeeding, breastfeeding and cesarean/caesarean.	<p>Provided evidence that with appropriate collaboration SSC during a cesarean delivery can be implemented.</p> <p>Immediate or early SSC after a cesarean section may increase breastfeeding initiation, decrease time to the first breastfeed, reduce formula supplementation in the hospital, increase bonding and maternal satisfaction, maintain the temperature of newborns and reduce newborn stress.</p>	<p>Limitations: Articles have small sample sizes and missing data in the quantitative studies.</p> <p>Lack of consistency across the articles.</p> <p>Articles revealed that women viewed their immediate or early SSC experiences as positive</p> <p>Provides evidence that immediate SSC is feasible in the operating room and can be provided safely and immediately in the operating room with the collaboration and education of staff, mothers, and partners.</p>	Level V



Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Frederick, A. C., Busen, N. H., Engebretson, J. C., Hurst, N. M., & Scheider, K. M. (2015). Exploring the skin-to-skin contact experience during cesarean section. <i>Journal of the American Association of Nurse Practitioners</i> , 28, 31-38.	To explore and describe the mother's experience of holding her infant SSC immediately after a cesarean birth in the operating room and recovery.	Ethnographic study	Eleven women between the ages of 23 and 38 years old.	Observations with field notes and individual interviews conducted at 24-48 hours postpartum. Interviews were transcribed verbatim and content analysis of both observational notes and transcripts were used to analyze the data.	<p>The main theme that emerged was the Mutual Caregiving that was shared between mother and infant.</p> <p>The desire to hold the infant and know their condition firsthand was the mother's priority before and during the cesarean.</p> <p>All mothers commented on the calming nature of the SSC for both themselves and their</p> <p>All mothers who breastfed had rapid success in latching the infant</p> <p>Mothers appreciated the support provided by the father</p>	<p>Strengths: No adverse events were observed before, during, or after the cesarean.</p> <p>SSC empowered the mother which helps to bolster maternal role confidence.</p> <p>Strengths: Unique to this study were the mothers' comments concerning the father's role and the support he provided during the intraoperative SSC</p>	Level VI

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Koopman, I., Callaghan-Koru, J. A., Alaojin, O., Argani, C. H., & Farzin, A. (2016). Early skin-to-skin contact for healthy full-term infants after vaginal and caesarean delivery: A qualitative study on clinician perspectives. <i>Journal of Clinical Nursing</i> , 25, 1367-1376.	Provide insight into key factors from a clinician's perspective that influence uninterrupted early skin-to-skin contact after vaginal and caesarean delivery of healthy full-term infants	Exploratory qualitative study	Eleven Clinicians including: five RNs and one MD from OB unit, and four RNs and one MD from the NICU	Interview sessions that were recorded, transcribed, and analyzed using thematic analysis approach. A coding framework was developed from which subthemes emerged.	<p>All participants indicated that early SSC was important and beneficial</p> <p>Institutional factors: Inadequate staffing and education of clinicians on early SSC</p> <p>Familial factors: Parental education and motivation were identified as important factors</p> <p>Barriers to implementation included the absence of a clinical algorithm and unclear definitions for eligible mothers and infants.</p>	<p>Limitations: Sample size is small</p> <p>Length of interview was limited due to busy clinicians</p> <p>Clinician perspectives only</p>	Level VI

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Sampaio, A. R., Bousquat, A., & Barros. (2016). Skin-to-skin contact at birth: A challenge for promoting breastfeeding in a "Baby Friendly" public maternity hospital in Northeast Brazil. <i>Epidemiol Serv Saude</i> , 25(2), 281-290.	To identify prevalence of compliance with the fourth step of the Baby-Friendly Hospital Initiative of placing babies SSC with their mothers immediately after birth for at least half an hour in a public hospital in Northeast Brazil	Cross-sectional observational study	107 mothers that had recently completed the fourth step properly	Face-to-face interviews were carried out using a structured questionnaire through the LimeSurvey software. The variable were described by absolute and relative frequencies. The hypothesis test used was Fisher's exact test.	Only 9.3% of mothers had completed step four properly; the fourth step was negatively associated to cesarean section, and adequacy was not associated with receiving guidance on breastfeeding during the prenatal period or with breastfeeding in the first hour of life.	Limitations: The evaluation process for obtaining and maintaining the title of "Baby Friendly" Hospital may need to be revised. The tools used are partially trustworthy and are not able to grasp the reality of institutions.	Level VI

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Stevens, J., Schmied, V., Burns, E., & Dahlen, H. (2016). A juxtaposition of birth and surgery: Providing skin-to-skin contact in the operating theatre and recovery. <i>Midwifery</i> , 37, 41-48.	To provide insight into the facilitators and barriers of providing skin-to-skin contact in the operating room and recovery	Ethnographic study	21 low-risk mothers having repeat cesarean sections, 26 support people, >125 staff members involved in their care and 43 staff members involved in focus groups/interviews.	Collecting video footage and field notes for up to two hours post cesarean section births, interviews at six weeks postpartum and staff focus groups/interview. Data was entered into NVivo20 and analyzed using critical ethnographic techniques.	Providing skin-to-skin contact in the operating theatre presents unique challenges due to the 'juxtaposition' of providing social and emotional care in an intrinsically medicalized setting. Staff members suggest that SSC in this environment can be improved by improving staff communication, addressing time constraints, adjusting the placement of equipment in the environment and making small changes to the way equipment is utilized.	<p>Limitations: Study provides information about one hospital and has a small sample size.</p> <p>Every hospital will have its own unique barriers that may not be addressed in this particular study.</p> <p>Strengths: Study provided insight into organizational and environmental barriers to providing SSC in this heavily medicalized environment where surgery and birth are juxtaposed.</p> <p>The findings are important because they show that barriers can be reduced or overcome through simple measures and that staff members can generate their own ideas on how to overcome these barriers.</p>	Level VI

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnyk)
<p>Brady, K., Bulpitt, D., &amp; Chiarelli, C. (2014). An interprofessional quality improvement project to implement maternal/infant skin-to-skin contact during a cesarean delivery. <i>Journal of Obstetric, Gynecologic, &amp; Neonatal Nursing</i>, 43, 488-496.</p>		Quality Improvement Project		<p>Initially, anecdotal data identified barriers previously unknown to the committees.</p> <p>Once a few tests of change had been completed, it became important to obtain more concrete data.</p> <p>A report was created to monitor trends through the EMR.</p> <p>Last piece of data collection was anecdotal experiences shared by the patients with the lactation consultants during their postpartum rounding</p>	<p>The barriers to the implementation of SSC in the OR were overcome with the interprofessional team. Continuous monitoring of staff compliance and data collection will ensure sustainability of the practice change. Through communication and collaboration, the healthcare team was able to overcome the barriers of SSC in the OR and have succeeded in fully implementing SSC.</p>		Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Dabrowski, G. A. (2007). Skin-to-skin contact: Giving birth back to mothers and babies. <i>Nursing for Women's Health, 11(1)</i> , 64-71.	N/A – Expert Opinion	N/A	N/A	N/A	The benefits of SSC immediately following birth should be explained to expectant parents during prenatal visits, childbirth preparation classes and admission to the intrapartum setting.	N/A	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
de Alba-Ramero, C., Camano-Gutierrez, I., Lopez-Hernandez, P., de Castro-Fernandez, J., Barbero-Casado, P., Salcedo-Vazquez, M. L., ... Pallas-Alonso, C. R. (2014). Postcesarean section skin-to-skin contact of mother and child. <i>Journal of Human Lactation</i> , 30(3), 283-286.	Describe a policy developed to ensure timely post-cesarean SSC.	N/A – Expert Opinion	N/A	N/A	Initial staff difficulties at accepting change in the SSC cesarean procedure were gradually overcome when it became evident that there were no additional complications for either mother or baby when SSC was established or when the companion was in the room.	N/A	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Grassley, J. S., & Jones, J. (2014). Implementing skin-to-skin contact in the operating room following cesarean birth. <i>Worldviews on Evidence-Based Nursing</i> , 11(6), 414-416.	N/A	N/A – Expert Opinion	N/A	N/A	Implementing a hospital-specific standardized process increased the rate of SSC in the OR from an infrequent occurrence to and expected practice. Barriers included difficulty positioning the newborn related to size or positioning of the surgical drape, mothers feeling nauseous or claustrophobic, infant condition, and short length of surgery.	N/A	Level VII



Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Hubbard, J. M., & Gattman, K. R. (2017). Parent-infant skin-to-skin-contact following birth: History, benefits, and challenges. <i>Neonatal Network</i> , 36(2), 89-97.	N/A	N/A – Comprehensive Review	N/A	N/A	<p>Many factors come into play that may reduce the occurrence of SSC. Health care providers have the ability and responsibility to impact the practice of SSC during the birth experience, postpartum period, and beyond.</p> <p>By valuing SSC as a beneficial practice, promoting education, and pursuing involvement within the care team, health care providers can help ensure implementation of this evidence-based practice.</p>	<p>Limitations: Some of the studies reviewed may not have captured all of the available data on the topic, which may influence the findings within the research.</p> <p>Some of the studies had small sample sizes and/or took place in a single hospital facility; these factors may limit the generalizability of the results within the literature reviewed.</p> <p>Some studied in the review did not use a RCT as the research design because of ethical issues (i.e., mothers and infants could not be randomly assigned to a SSC or no SSC group because of its known benefits). This impacts the ability to claim causation between the two variables.</p>	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnyk)
Hung, K. J., & Berg, O. (2011). Early skin-to-skin after cesarean to improve breastfeeding. <i>The American Journal of Maternal/Child Nursing</i> , 36(5), 318-324.	N/A	N/A - Quality Improvement Project	N/A	LATCH tool to track the progress of the project	<p>Effective communication is essential to the success of SSC intervention. Communication regarding SSC should begin preoperatively between the nurses, the patient, and the medical team, so that the entire team is aware of the possibility of SSC in the OR.</p> <p>A critical role for nurses is to advocate for patients and families in situations where breastfeeding practices are not evidence-based, such as after cesarean births.</p>	N/A	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Mangan, S., & Mosher, S. (2012). Challenges to skin-to-skin kangaroo care: Cesarean delivery and critically ill NICU patients. <i>Neonatal Network</i> , 31(4), 259-261.	N/A	N/A – Expert Opinion	N/A	N/A	Barriers continue to exist with the implementation of SSC after cesarean deliveries as well as for critically ill neonates.  A collaborative approach between perinatal and neonatal team members can effectively introduce SSC as routine practice in the OB OR and at the Level III NICU.	N/A	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Moran-Peters, J. A., Zauner, C. R., Goldman, S., Baierlein, J., & Smith, A. E. (2014). A quality improvement project focused on women's perceptions of skin-to-skin contact after cesarean birth. <i>Nursing for Women's Health, 18</i> (4), 294-303.	A quality improvement project was conducted to evaluate the implications of the unavailability of SSC following a cesarean birth and to identify perceptions of women who performed SSC after their cesarean section.	N/A – Quality improvement project	Six mothers, between the ages of 27 and 40, who were English Speaking and who were having a repeat, elective cesarean.	Participants were asked to compare the recent and past cesarean birth experiences regarding the performance of SSC with the newborn immediately following the cesarean.  Data was collected until saturation.  Project lead staff analyzed the data using a conventional qualitative content analysis approach.	This project found that the bonding and breastfeeding benefits associated with immediate SSC following a cesarean birth were consistent with earlier findings.  Nurses working in L&D settings should promote the practice of SSC immediately following birth.  Moments right after birth represent the ideal timeframe for initiating breastfeeding	Strengths: Qualitative evaluation of SSC in the OR.  Women's perspectives, perceptions and experiences provided a compelling justification for the QI project.  Limitations: Small sample size	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnyk)
Schneider, L. W., Crenshaw, J. T., & Gilder, R. E. (2017). Influence of immediate skin-to-skin contact during cesarean surgery on rate of transfer of newborns to NICU for observation. <i>Nursing for Women's Health, 21</i> (1), 28-33.	Purpose of this project was to test for a difference in the proportion of transfers to the NICU for observation before and after immediate SSC was implemented	Evidence-Based Practice Project - Retrospective analysis	2,841 newborn that were born by scheduled or non-emergent cesarean births from 2011 through 2015.	Pearson's chi-square test was used to test for a difference between the proportion of transfers to the NICU for observation before and after implementing SSC during cesarean surgery.	A significant difference in the proportion of newborns transferred to the NICU for observation after implementing SSC. Fewer newborns were transferred to the NICU.	Limitations: Project was conducted at a single site and included only scheduled and nonemergent cesarean surgeries.  Strengths: EBP adds to the body of literature about immediate SSC during a cesarean section.	Level VII

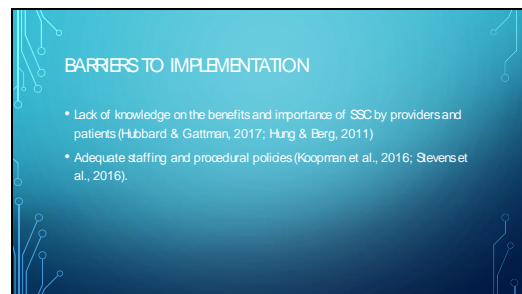
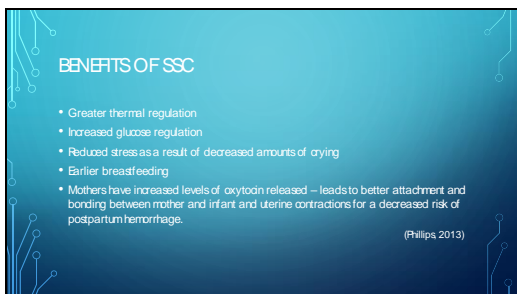
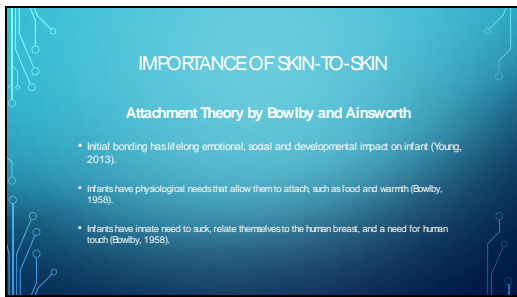
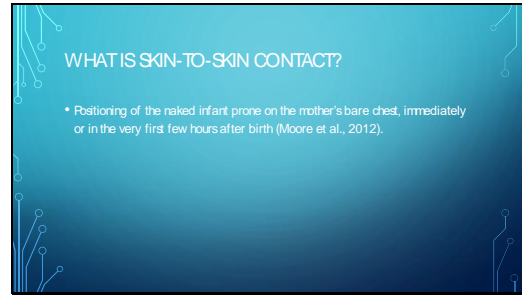
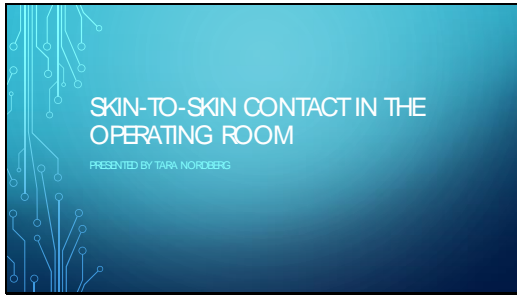
Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Schorn, M. N., Moore, E., Spetalnick, B. M., & Morad, A. (2015). Implementing family-centered cesarean birth. <i>American College of Nurse-Midwives</i> , 60, 682-690.	N/A	N/A – Expert Opinion	N/A	N/A	Implementing family-centered cesarean births in a large hospital setting can be accomplished through interprofessional cooperation; however, it requires planning, coordination, and administrative support.  SSC in the operating room may increase the rate of exclusive breastfeeding.	N/A	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Stone, S., Prater, L., & Spencer, R. (2014). Facilitating skin-to-skin contact in the operating room after cesarean birth. <i>Nursing for Women's Health, 18(6)</i> , 486-499.	Purpose of the project was to develop a protocol for health care professionals' roles in providing SSC in the operating room; to implement the protocol; and to evaluate the process of implementation of the EBP intervention	N/A – Evidence Based Practice Project	N/A	N/A	During this project, champions from each key discipline came together and collectively worked together through all concerns and issues related to implementation of SSC in the OR.  This project adds to the body of evidence that SSC after cesarean in the OR is safe, desired by mothers, beneficial for newborns and considered acceptable practice in multidisciplinary health care teams.	N/A	Level VII

Author(s), Title, and Publication year	Purpose	Study Design	Sample	Data Collection and Measurement	Findings	Strengths/Limitations	Level of Evidence (Melnik)
Sundin, C. S., & Mazac, L. B. (2015). Implementing skin-to-skin care in the operating room after cesarean birth. <i>The American Journal of Maternal Child Nursing</i> , 40(4), 249-255.	Evaluate maternal satisfaction and maternal perception of pain when babies were placed SSC immediately after cesarean birth in the OR	N/A – Quality improvement project	46 patients that received SSC in the OR	Over a 90-day period, all women having cesarean births were evaluated for two outcomes, maternal birth experience and pain perception during surgery.  Postpartum interviews with the new mothers and review of their anesthesia records were used to determine project findings	Maternal satisfaction was higher and maternal perception of pain was lower for women who experienced SSC in the OR when compared to women where SSC was not performed.	Limitations: Noted during implementation in the OR included staff adherence, staff's comfort levels, and discrepancies in the interpretation of the process.	Level VII



Appendix B



### IMPLICATIONS FOR PRACTICE

- Nurses have a unique opportunity to change the way infants are care for immediately after birth (Dabrowski, 2007).
- Routine practices of caring for infant can happen when infant is skin-to-skin with their mother (Hung & Berg, 2011).
- Implementing SSC after a cesarean birth can be initiated in the OR with the collaboration with the interprofessional team and continued until the end of recovery (Dabrowski, 2007).

### INTERDISCIPLINARY ROLE OF STAFF IN OR

- Anesthetist: Awareness of infant at head of table with mother. Awareness of the mother's need for analgesia with adequate pain and nausea control. Provide adequate space for support person and transition nurse to be near the head of the table for infant support. Allowance of mother to have one arm free during surgery.
- Surgeon and First Assist: Awareness of infant at head of table. Allowance of mother to have one arm free during surgery.
- Surgical Tech: Awareness of infant at head of table.
- Neonatal Resuscitative Care team: Reassurance and stabilization of infant immediately after delivery. Assisting mother in preparation and execution of skin to skin. Report to transition nurse after infant is stabilized.
- Transition nurse: Assisting mother in preparation and execution of skin to skin contact. Monitor infant for the duration of the cesarean section. Assist staff with transfer to recovery area with focus on the infant.
- Discharge nurse: Awareness of infant at head of table. Assisting mother in preparation and execution of skin to skin contact. Assist in transferring infant with mother to recovery area.

(Godby, 2016)

Stage/ Pre-operatively: 1. Patient Education	Patient is educated about skin to skin utilizing the "Golden Hour" paper and asked if she would like to have her baby placed skin to skin after delivery.	Documentation occurs under education and plan of care
1. Physical Preparation	No bra is present and band may be placed	
Intraoperatively/In OR 1. Preparation of patient in OR	Patient is prepared with the gown taken off after the spinal and warm blanket placed across the chest. Band remains in place if used.	
2. Time Out Communication	Plan of care for skin to skin is addressed during the time out so that anesthesia and NNP/RT and surgeon are aware of patient request and plan of care.	Time out is documented as usual
3. NNP/RT	Assume care of newborn as usual and assess for stability for skin to skin. Contact Baby RN to assume care of newborn.	Documentation as usual
4. Baby Nurse	Will go into OR and assume care of baby and place baby skin to skin. Should the baby nurse not be able to accomplish this she will need to find a substitute care giver. (distraction, RT)	Documentation of assuming care as usual. Document skin to skin when begun and when discontinued.
Transfer to PICU	Baby to be placed in the transport basket with a warm blanket until mother is on PICU stretcher and then baby may be placed skin to skin again.	Safety of the baby during the time when mother is being assisted to move to bed is critical. Not appropriate to have father hold the baby during this critical time. (Bopp, 2019)

### PATIENT EDUCATION ON C-SECTION

- When can I hold and feed my baby?
  - We encourage Skin-to-skin and breastfeeding immediately after delivery.
  - Skin-to-skin contact is when you hold your undressed, diapered newborn on your bare chest (i.e. without a bra or shirt on). Skin-to-skin contact is also referred to as kangaroo care.
  - Skin-to-skin should be started as soon as you and your baby are ready in a C-section
  - The benefits of Skin to Skin include regulating the temperature of you and your baby, helping with breastfeeding, has a positive impact on bonding with your baby, calms both of you, and regulates your baby's heartbeat, breathing, and blood sugar.

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