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## To improve proportion of neonates receiving uninterrupted skin to skin contact at birth: A quality improvement project

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### Abstract

This quality improvement project aimed to enhance the proportion of neonates receiving uninterrupted skin-to-skin contact immediately after birth, a practice known to facilitate breastfeeding, improve infant physiology, and strengthen mother-infant bonding. Despite global recommendations, a notable gap exists in actual practice, particularly concerning the duration and prevalence of skin-to-skin contact in the immediate postpartum period. This study, conducted over four months at Maharishi Markandeshwar Medical College and Hospital, Solan, involved 100 late preterm and term neonates to establish a baseline of skin-to-skin contact practices and identify barriers to sustained contact. Through the Plan-Do-Study-Act (PDSA) cycle approach, targeted interventions were implemented, including staff education on WHO guidelines, environmental adjustments, and procedural modifications to facilitate skin-to-skin contact. Post-intervention analysis showed a significant increase in the proportion of neonates receiving at least one hour of uninterrupted skin-to-skin contact, indicating the effectiveness of the quality improvement initiatives. The study underscores the feasibility of enhancing skin-to-skin contact practices through systematic, hospital-wide interventions.

**Keywords:** Skin-to-skin contact, breastfeeding, neonatal care, PDSA cycle

### Introduction

Separation of newborns from their mothers has effects on breastfeeding initiation, infant physiology and bonding. The journey of the mother and her infant towards obtaining and maintaining a successful breastfeeding partnership can be enhanced by providing uninterrupted skin to skin contact soon after birth. Amount of social interaction between a human mother and her infant in the immediate postpartum period can influence the mother's subsequent behaviour and attitude towards the infant. The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommends that children initiate breastfeeding within the first hour of birth.

The routine practice of separating mothers and babies after birth, which became popular when birth entered the hospital system in the mid 20<sup>th</sup> century, has largely been replaced by mother and newborn skin-to-skin contact and rooming-in in many parts of the world. Skin to skin contact refers to placing the naked baby on the mothers bare chest immediately following birth or soon afterwards<sup>[1]</sup>.

Babies who are born and placed prone across their mother's abdomen or chest while being dried and assessed and who remain in this position covered with a warm blanket will progress through a predictable set of behaviours in readiness to breastfeed. The hour after birth is a sensitive period, when skin-to skin maternal-newborn interactions foster peak oxytocin activity. Benefits of it may include:

- Stronger contractions, likely reducing postpartum haemorrhage risk because high maternal oxytocin levels at physiologic birth are further elevated through early skin-to-skin contact and newborn pre-breast feeding behaviors.
- Natural warming of the newborn through vasodilation of mother's chest
- Activation of hormonally- mediated maternal-infant biologic bonding
- Facilitation of breast feeding initiation, including by reducing maternal and newborn stress<sup>[2]</sup>.

In a study of 1,014 sample size where “separating newborns from mothers and maternal consent for newborn care and the association with health care satisfaction, use and breastfeeding: Findings from a longitudinal survey in Kenya” showed that 17.6% of women reported being separated from their newborns at the facility after delivery, of whom 71.9% were separated over 10 minutes. 44.9% felt separation was unnecessary and 8.4% reported not knowing the reason for separation [3].

Despite the guidelines and reminders to staff, it was felt that one hour of uninterrupted contact was not being maintained. Experience shows that new guidelines take time and effort to be implemented. Hence we planned to take it up as a Quality improvement project.

## Aims And Objectives

### Phase I

**Aim:** To study the prevalence of skin to skin contact with the mother and it's duration in the first hour of life for late preterm and term neonates. Also, the impact of this separation on the breast feeding practices for these mothers and their infants.

### Objectives

- Proportion of all enrolled neonates who do not receive skin to skin contact with mother at birth and reasons for separation
- Duration of uninterrupted skin to skin contact with the mother at birth.

### Phase II

To conduct a root cause analysis for reasons of separation from the mothers and devise quality improvement initiatives to decrease the proportion of neonates separated from their mothers and increase the duration of uninterrupted skin to skin contact with mother at birth using the PDSA cycle approach

## Materials and Methods

The study was conducted in the Department of Pediatrics MMMCH Solan over a period of 4 months from 1<sup>st</sup> February 2023 to 30th September 2023.

**Study Design:** A Quality improvement initiative using the PDSA approach

**Population:** Late preterm and term neonates (Gestation between 35 weeks to 42 weeks) born at MMMCH during the study period were enrolled Inclusion criteria

1. Late preterm and term neonates (Gestation between 35 weeks to 42 weeks) born at MMMCH during study period
2. Mother and baby dyad admitted for at least 24 hours post delivery

### Exclusion criteria

1. Shock, ventilatory support, psychosis or any life endangering medical problem in mother which warrants separation of the newborn.
2. Neonate requiring resuscitation
3. Major congenital anomalies in the baby
4. Gestational age <35 weeks and birth weight <2000gms.
5. Any other neonatal condition warranting early NICU admission

## Methodology

100 consecutive deliveries of late preterm and term babies being conducted in MMMCH Solan were audited to find out the baseline data regarding proportion of all neonates who did not receive skin to skin contact with mother at birth and reasons for separation and duration of uninterrupted skin to skin contact with the mother at birth. Any feeding problems arising due to separation were also documented using a predesigned proforma.

After determining the extant of the problem, a team consisting of all the stakeholders was formed involving personnel at every level involved in baby care. Root cause analysis was carried out using the tools of process flow chart and fish bone analysis. After identifying the possible causes, solutions were identified and tested using the PDSA (Plan, Do, Study, Act) cycle approach over the next 1 month. The feasible solutions were implemented and data was collected over next 2 months using the previous proforma to look for any improvement.

## Results: Phase 1

### Baseline data

A total of 100 deliveries were audited over 2 months from 1/2/23 to 8/4/23. The mean gestational age of the neonates was 38.04 weeks and the mean birth weight was 2864.01 Gms. Mean APGAR score at 1 minute and 5 minutes were 8.24 and 8.89 respectively. Of the 100 deliveries, 69 were NVD and 31 were LSCS.

Of the 100 deliveries audited, 74 of the babies were received on mother's abdomen at birth while 26 were not. All these 26 neonates who were not received on the mother's abdomen were delivered by LSCS.

Among the 74 neonates received on the mother's abdomen, Duration of skin to skin contact in minutes was <1 min in 68 and 6-15 mts in 6 babies. The proportion of neonates receiving skin to skin contact at birth for 1 uninterrupted hour was zero. The most common reason for removing the baby before 1 hour was for giving vitamin k injection and neonatal assessment (among 71 newborns) and gynaecologist interference in 3 cases.

Despite this, breastfeeding was initiated within 1 hr among 79% neonates, between 61mts to 90mts in 14%, 91-120 mts in another 6%. Only 1 baby received breast feed after 2 hrs. None of the babies received any prelacteal feed, and 99% received exclusive breast feeds in 1<sup>st</sup> 24 hours. Only one baby received any top feed in 1<sup>st</sup> 24 hours, the reason being maternal anxiety (for insufficient milk).

### Phase 2

After determining the extant of the problem, a team consisting of all the stakeholders was formed involving personnel at every level involved in baby care. Root cause analysis was carried out using the tool of fish bone analysis. After identifying the possible causes, solutions were identified and tested using the PDSA (Plan, Do, Study, Act) cycle approach over the next few days. It was planned to increase the proportion of neonates receiving uninterrupted skin to skin contact following normal vaginal delivery from 0 to at least 50% over the next month. The feasible solutions were implemented and data was collected over next 2 months using the previous proforma to look for any improvement.

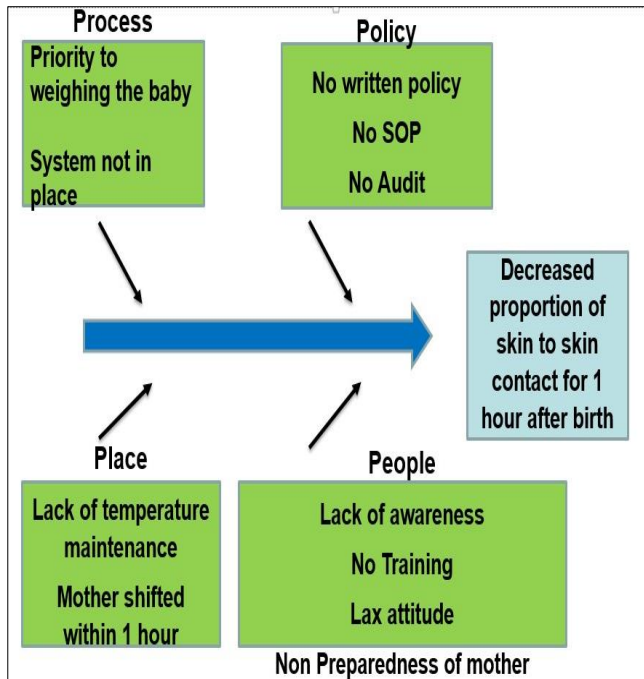


Fig 1: Fish bone analysis of the problem

### PDSA cycle I

The most common reason identified for removing the baby before 1 hour was for giving vitamin k injection and neonatal assessment (among 71 newborns) and gynaecologist interference in 3 cases. This was also because there was no written policy in the department and the residents involved in receiving the baby were not aware of this guideline.

All the stakeholders involved at the time of delivery in the labour room, namely pediatric and Obs and Gynae residents, and Senior residents and faculty were informed regarding the WHO guidelines of skin to skin contact for neonates with mother at the time of birth for at least 1 hour. The method was explained in detail and the benefits to the mother and baby were also explained. The staff were taught to give

Vitamin K to the baby on the mother's abdomen itself. The pediatric residents were also told to assess the baby on the mother's abdomen and to remove the baby after 1 hour for weighing and other anthropometric measurements. Any queries or doubts regarding implementation were actively sought and resolved. Similar training was also given to the nurses involved in the delivery room. This new policy was also included in the departmental manual. Also it was decided to implement this policy for all normal deliveries and exclude LSCS for the time being till everyone was used to this new policy.

For the next 2 days, the data was again collected for next 7 deliveries and feedback from the pediatric residents was sought. Vitamin K was being given during skin to skin contact. However, they were able to keep the newborns on the mother's abdomen for about 30 mts to 45 mts only. In 6 of the cases, the baby had cold stress and was hence removed and wrapped up with clothing and handed to the mother, while in one case, the mother was not willing to keep the baby as she was in pain.

**PDSA Cycle II:** One of the main problems that were

inhibiting the implementation of this quality improvement project was that the baby would become cold by about 45 minutes.

Though the labour room temperature as recorded on the digital thermometer was above 25 degrees Celsius, the baby would turn cold as Solan is a hill station with lower temperatures. It was decided to keep the ambient temperature around 26 to 28 degrees during delivery. As there was no provision of central heating for the labour room, the administration (Medical Superintendent) was apprised of this problem by the HOD of Obstetrics and the main investigator. As it would logistically take a long time to install central heating (though it was decided that it would be done on a priority basis) pillar heaters were installed in the labour room and recovery room where the mother was shifted after delivery. They would be switched on as soon as the mother was shifted to labour room for delivery and ambient temperature at the time of delivery would be noted in the delivery notes and checked by consultants on rounds. The pediatric residents attending the delivery were also advised to put a cap, mittens and socks on the baby and cover the mother and baby with at least 3 layers (e.g. shawl, or blanket)

Reluctance on the part of the mothers was dealt with by asking the Obstetricians to prepare the mother before delivery that the baby would be kept on their abdomen. Also pediatric resident/ Interns to stand by the mother and support her for the entire duration of skin to skin contact. Data was again collected over the next 2 days. The baby was now being kept warm, but there was a logistic problem noted in maintaining uninterrupted skin to skin contact as some of the mothers were being shifted from the labour room to the recovery room about 30 -45 mts after the delivery.

### PDSA cycle III

To maintain the baby's temperature while shifting the mother to recovery room which was being done in a wheel chair, the nurses involved in the shifting were taught to help the mother to maintain skin to skin contact during transfer. Temperature of the recovery room was also to be monitored so that one hour of uninterrupted contact could be maintained.

Data for the next 50 deliveries was then collected and analysed to look for any improvement and to see if the targets were being achieved.

### Post Intervention data

A total of 100 deliveries were audited over 3 months from 18/8/23 to 17/11/23. The mean gestational age of the neonates was 38.21 weeks and the mean birth weight was 2890.53 gms. Mean APGAR score at 1 minute and 5 minutes were 7.97 and 9.0 respectively. Of the 100 deliveries, 61 were NVD and 37 were LSCS and 2 were forceps.

Of the 100 deliveries audited, 96 of the babies were received on mother's abdomen at birth while 4 were not. Of these 4 neonates who were not received on the mother's abdomen, 3 were delivered by LSCS and one was a pair of twins where only one baby could be accommodated.

Among the 96 neonates received on the mother's abdomen, Duration of skin to skin contact in minutes is shown in Table 1.

**Table 1:** Show the duration of skin to skin contact in minutes

Duration of contact	Number	Percentage
≥ 60 min	68	68%
45-60 min	3	3%
16-30 min	8	8%
6-15 min	15	15%
1-5 min	2	2%

The reasons for removing before 1 hour in 28 of the babies are shown in Table 2:

**Table 2:** The reasons for removing before 1 hour in 28 of the babies

Reason for removing before 1 hour	Number	Percentage
Hypothermia	10	35.7%
Baby cyanosed	2	7.1%
While shifting from labour room	5	17.8%
PPH in mother	1	0.4%
Mother uncomfortable	2	7.1%
Baby crying continuously	8	28.6%

Breastfeeding was initiated within 1 hr among 99% neonates. None of the babies received any prelacteal feed, and 99% received exclusive breast feeds in 1<sup>st</sup> 24 hours. Only one baby received any top feed in 1<sup>st</sup> 24 hours, the reason being maternal anxiety (for insufficient milk).

### Conclusion

Using this PDSA based quality improvement approach, we were able to implement the new guideline in 68% of the cases.

The project is still ongoing and eventual target will be to achieve uninterrupted skin to skin contact for 1 hour in 80% of the deliveries.

### Conflict of Interest

Not available

### Financial Support

Not available

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