What's Happening at the Frontline?: Assessment and Quality Improvement of

Bedside Maternal Care in Rural India

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Abstract

Background: In an effort to reduce maternal mortality (MM), India initiated one of the largest maternal health programs worldwide in 2005. Despite a substantial increase in facility-based deliveries, India has not seen a significant reduction in MM and still accounts for 15% of the world's maternal deaths. There is an urgent global need to address stagnant MM rates by ensuring that facilities and birth attendants have the required skills and knowledge to save lives.
Purpose: The purpose of this project is to explore intrapartum and postpartum care practices and identify opportunities for quality improvement at a rural hospital in Gujarat, India.
Method: This project took place at a rural community health center in Gujarat, India. Maternal care practices were observed and compared to World Health Organization (WHO) maternal care standards for five weeks in June-August 2017. Ninety-four maternity charts from January through May 2017 were reviewed for care documentation, and 10 nurses completed self-assessment surveys in perceived knowledge and skills of obstetric care. Following this needs assessment, collaboration with local stakeholders occurred to identify areas for quality improvement and initiate interventions. Interventions included implementation of the adapted WHO's Safe Childbirth Checklist (SCC), two weeks of on-site clinical coaching, and one two-hour training for bedside caregivers on maternal assessments. Pre and post-tests were used to evaluate effectiveness of training. Follow up observations and chart reviews occurred four months after implementation of quality measures.
Results: Observations and chart reviews revealed that care does not currently adhere to WHO peripartum care standards. Chart reviews revealed that 21% (20/94) of laboring mothers had blood pressure, less than 3% (3/94) had pulse, 32% (30/94) had fetal heart tones, and 3% (3/94) had temperatures recorded on admission. These charting gaps were mirrored by observed practices for 23 deliveries. Numerous opportunities for improvement were revealed, while some care met WHO care standards. Of note: 100% (23/23) of women were accompanied by family or community support during the first stage of labor and 100% (13/13) of women received uterotonics immediately after delivery. Of the nurses who completed the aptitude survey, only 33% felt confident in recognition of the leading causes of maternal mortality worldwide, pre-eclampsia and too much bleeding after birth.

After initiation of one PDSA-cycle of quality improvement measures, significant differences were seen in the pre and post-test scores and chart reviews. All assessments, except for heart rate, increased by over 100% post-intervention.
Going Forward: This assessment identified significant gaps in knowledge and obstetric care delivery among frontline nurses in India. A series of interventions to improve care quality are highly recommended. Addressing the knowledge gap through continuation and expansion of quality improvement measures should be pursued to improve maternal morbidity and mortality.

Introduction

Problem Description

Developing regions account for approximately 99% of maternal deaths worldwide (WHO, 2015). India, alone, accounts for 15% of the global burden at 45,000 maternal deaths per year, or 123 maternal deaths per day, from preventable pregnancy and childbirth related causes (WHO, 2015). Evidence has shown that one of the foremost interventions for improving maternal outcomes is the presence of a skilled birth attendant (Das et al., 2017; Bailey, Paxton, Lobis, & Fry, 2006). In an effort to improve maternal outcomes, India initiated one of the largest maternal health programs worldwide in 2005 with an emphasis on shifting deliveries from homes to facilities with trained birth attendants (Mohanty & Kastor, 2017). Despite India's substantial increase in facility-based deliveries, the country did not see the anticipated improvements and did not see a 75% reduction in maternal mortality (MM), per Millennium Development Goals (WHO, 2017). India remains at a stagnant maternal mortality rate (MMR) of 174/100,000 with some rural regions of India reaching rates of 310/100,000 (Randive, Diwan, & De Costa, 2013; WHO, 2015; Himanshu & Kallestal, 2017). This lack of progress has been attributed to a lack of skilled care personnel in facilities, especially in rural settings (Das et al., 2017). Shifting deliveries into facilities is the answer only if facilities are providing evidence-based care and have adequately skilled staff. To effectively reduce maternal mortality and morbidity, India must ensure that facilities and birth attendants have the requisite skills, knowledge, and supplies to safeguard lives.

Available Knowledge

The World Health Organization has established standards for safe maternal care in rural settings. These standards include, but are not limited to: routine maternal assessment on admission and during labor and childbirth; assessment and documentation of fetal heart rate, maternal blood pressure, pulse and temperature during labor, childbirth, and early postpartum; no application of "fundal pressure to facilitate the second stage of labour"; delayed umbilical cord clamping between one to three minutes after delivery; administration of a uterotonic within one minute after delivery; skin-to-skin contact initiated immediately after birth; supported breastfeeding within the first hour after birth; and no woman is subjected to mistreatment such as physical or verbal abuse (WHO, 2016, p. 25, 48).

Current practices were observed at a rural health center in Gujarat, India and compared to WHO standards for rural settings to identify needs and gaps in care. It was determined that many areas were lacking, though some care met expectations. Of note: fetal heart tones were assessed 7% (n=15) of the time, temperature or heart rate was assessed 5% (n=22) of the time, 39% (n=23) of mothers had blood pressure assessed upon arrival, and no mothers (n=22) had blood pressure assessed after admission. Fifty-seven percent (n=14) of mothers had fundal pressure applied during delivery, 7% had delayed cord clamping, 33% (n=15) had skin-to-skin initiated within the first two hours, and 10% (n=20) had breastfeeding assessed within the first two hours postpartum. Thirty-three percent (n=15) of mothers experienced verbal abuse and 36% experienced physical abuse (n=11) in the form of slapping, pushing, or being held down. Of note, 100% (n=14) of mothers received a uterotonic immediately after delivery, and 100% (n=23) were accompanied during the first stage of labor.

This observational assessment revealed opportunities for improved care. Gaps must be understood within a resource-constrained context where frontline nurses lack essential knowledge and skills in basic obstetric care. Without addressing these gaps, it will be difficult to attain desired care standards. The next phase of this collaborative project focused on further assessment of baseline needs and knowledge, followed by capacity building of frontline nurses while engaging and empowering them in the quality improvement process.

Rationale

After identifying a lack in routine intrapartum and postpartum assessments, solutions were sought alongside local stakeholders. It was collaboratively determined that the World Health Organization's (WHO) Safe Childbirth Checklist (SCC) would be an effective tool to be adapted and implemented among frontline nurses in Gujarat, India, along with a two-hour training session for bedside nursing staff, and two weeks of clinical coaching (see appendix A).

The SCC is a tool created by the WHO to address major causes of adverse birth outcomes including maternal death, intra-partum related stillbirths and neonatal deaths. The SCC models checklists that have been successfully implemented in surgical centers to decrease infection and mortality (Haynes et al., 2009). This tool utilizes rigorous methodology and has been tested for usability in resource poor settings throughout Africa and Asia (WHO, 2015b). It is recommended that this tool be modified to meet local needs and used in resource poor settings.

Successful adoption of this tool has shown improved adherence to essential, evidence-based birth practices among birth attendants in India (Kara et al., 2017; Delaney et al., 2017). Implementation of the SCC in states throughout India has been done through staggered phases of training, observation and clinical coaching (Kara et al., 2017). This project is the first of many phases for assimilation of the SCC into standard care at this facility. This initial phase includes

on site clinical coaching with introduction and training to the first foundational assessments needed for use of the SCC.

Specific Aims

The purpose of this project is to improve adherence to internationally recognized standards of care through provision of a validated tool and enhancing the knowledge and skills of frontline healthcare providers in safe and respectful maternal care at a rural hospital in Gujarat, India. This project aims to first assess current intrapartum and postpartum care practices to identify areas for quality improvement, followed by collaboration with local stakeholders to identify, adapt, and implement a validated tool to improve adherence to evidence based care. This paper will evaluate the early effectiveness of the training received by frontline nurses and the implemented tool.

Methods

Context

This project was implemented at a small rural hospital in Gujarat, India. The facility employs one OB/GYN, five general practice physicians, eleven nurses, and ten ancillary staff known as ward boys and sweepers. Ancillary staff members are dedicated individuals, indigenous to the area, that receive on the job medical-task training. This hospital has the potential capacity for 12 maternal care beds, 14 malnutrition beds, 28 medical surgical patients, four adult intensive care beds, and ten neonatal intensive care beds. Nurses are responsible for patient cares in all wards, including prenatal, intrapartum, and postpartum care. This facility serves a population size of approximately 100,000 from forty-two surrounding villages averaging 30-50 deliveries per month. The nearest referral center is a one-hour ambulance ride away.

The OB/GYN is available for assistance if there are complications and for non-emergent cesarean sections, Monday through Saturday. General practitioners oversee deliveries when the OB/GYN is not available, and all cesarean sections must be referred out. Physicians are on-site six hours per day, and on call for the remainder of the day. Nurses staff this facility 24 hours a day and are the frontline care givers for laboring mothers and during delivery, with support from ward boys and sweepers. Target participants for this project were the ten nurses participating in maternal care at this facility.

Interventions

Intrapartum and postpartum care practices were observed at this rural hospital in Gujarat, India to identify gaps in care and opportunities for quality improvement. An on-site needs assessment was performed for five weeks from June through July, 2017 and consisted of maternal care observations, chart reviews, and aptitude surveys of frontline maternal caregivers. Cares and interventions for 23 laboring mothers were observed and compared to standards established by the WHO. Ninety-four maternal charts from January through June 1, 2017 were selected at random and reviewed for frequency of recorded blood pressures, heart rates, temperatures, and fetal heart tones upon arrival and throughout admission. Charts were also assessed for postpartum bleeding after admission and before discharge. Ten nurses responsible for intrapartum care were assessed for their training and perceived confidence in obstetric skills through an aptitude survey. This survey assessed whether nurses had received training on necessary obstetric skills, as determined by Jhpiego, and whether they felt confident in those skills (see appendix B) (Jhpiego, 2012).

Stake holders including the OB/GYN, nursing staff, and hospital manager were informed of observation, chart review, and aptitude survey results. After identifying a lack in routine

intrapartum and postpartum assessments, solutions were sought alongside local stakeholders. It was collaboratively determined that the WHO's SCC would be an effective tool to be adapted and implemented among frontline nurses for quality improvement surrounding intrapartum assessments and interventions.

The SCC was adapted for local needs and focus, and then introduced to staff by the OB/GYN at a nurse staff meeting. Nurses were informed that the SCC would be used for every laboring mother presenting to their facility for care. Introduction of the SCC was followed by training and clinical coaching provided by two Doctor of Nursing Practice (DNP) students. Nursing staff were divided into two groups to complete the initial training on effective use of the SCC, maternal assessments, recognition of pre-eclampsia, and evaluation and recording of maternal vital signs. Nurses were assessed for knowledge acquisition via immediate pre-test and post-test. The pre/post-tests were approved by the OBGYN and training team (see appendix B). Implementation of the SCC and training was accompanied by two weeks of on-site clinical coaching. DNP students provided on-site mentoring on use of the SCC, the accompanying partograph, and how to perform obstetric assessments and skills such as assessment of cervical dilation, blood pressure, and fetal heart tones in a clinical setting.

Four months after implementation, DNP students returned to the site to evaluate early effectiveness of the SCC, training, and clinical coaching. Post-intervention data collection included assessment of 83 randomly selected maternal charts for the same elements previously delineated from September first through December 15, 2017. Pre and post-intervention chart reviews were statistically analyzed for significant changes.

Measures

Benchmarks for evaluation of maternal care at this rural facility were pooled from the

WHO's (2016) *Standards for Improving Quality of Maternal and Newborn Care in Health*

Facilities. These standards were synthesized and reviewed by an interdepartmental steering

group to define quality care and formulate a framework for ensuring quality care. These

benchmarks were then reviewed by the Guideline Development Group in Geneva (WHO, 2016).

The WHO's established and validated benchmarks were reviewed with local

stakeholders. It was determined through four consecutive stakeholder meetings that standards

surrounding initial and ongoing assessments of maternal and fetal vital signs would be the focus

of initial quality improvement interventions. Adherence to standards were assessed through

bedside care observation and chart reviews. Data entry was reviewed by content experts to

ensure quality of data entry.

Analysis

Descriptive statistics were used to analyze data before and after interventions. Chart

reviews were analyzed using a Fisher's Exact Test to compare pre and post-intervention medians

for each category of evaluation including: blood pressure, fetal heart tones, maternal heart rate,

and temperature on admission, as well as blood pressure, fetal heart tones, maternal heart rate,

and temperature any time after admission and an assessment of bleeding any time after delivery.

Pre and post-tests were administered to ten bedside nurses immediately before and after the two

hour training. Eight nurses completed both pre and post-tests, and results were analyzed via the

Wilkoxon-signed rank test to evaluate the effectiveness of the educational intervention.

Ethical Considerations

This project was submitted to the University of Utah's International Review Board and received non-human subjects' research status. There are no conflicts of interest to report.

Results

In phase one of this study, maternal assessments were observed and chart reviews were conducted to determine the frequency of maternal assessments. An aptitude survey was administered to nurses to determine training received in obstetric skills and their confidence in performing those skills (see appendix C). Of note, 44% of nurses stated they received training in recognizing signs of pre-eclampsia, and even fewer at 33% felt confident in their skills to do so. 67% of nurses stated they received training on recognizing too much bleeding after birth, with 33% feeling confident in their ability to use that training at the bedside (see Table 1.1).

| Obstetric Care: Training and Confidence of 10 Bedside Nurses		
SKILL	Received Training	Confident in the Skill
Obtain Maternal Vital Signs	100%	100%
Partograph Use	100%	30%
Recognize Signs of Pre-Eclampsia	44%	33%
Check Uterine Tone After Birth	89%	86%
Recognize too much bleeding after birth	67%	33%
Manage Post-Partum Hemorrhage	56%	22%
Shoulder Dystocia Recognition	0%	0%

[Table 1.1]

Ninety-four charts from January 1, 2017 through June 1, 2017 were randomly selected for a pre-intervention review. Charts revealed that 21% of mothers arriving for delivery had a blood pressure taken, 32% had fetal heart tones assessed, 3% had a heart rate recorded, and 3% had a temperature taken. Between admit and discharge, 19% of mothers had an assessment of blood pressure, 18% had fetal heart tones assessed, 9% had a temperature taken, and 9% had an assessment of bleeding after delivery.

In phase two of this intervention, ten nurses participated in staff training on maternal assessments and use of the WHO's SCC with administration of the maternal assessment knowledge base pre and post-test survey. Nurses also received two weeks of on-site clinical coaching. Eight of the ten staff nurses in attendance completed both the pre and post-test. Two nurses were not included due to incomplete pre or post-surveys. Pre-training survey scores averaged 72%, compared to 92% post-training. Statistical analysis with a Wilcoxon Signed Rank Test indicate that there is a significant difference between the pre and post-test scores (p=0.0215). Post-tests included assessment of confidence in recognizing symptoms of pre-eclampsia. Results indicate that 100% (n=9) of surveyed nurses felt confident in recognition of signs of pre-eclampsia post-training, up from 33% before training.

Phase three involved follow-up chart reviews four months post-intervention. Eighty-three charts were randomly selected for review between the months of September and December 2017. Results showed that on admission 46% of mothers had assessment of blood pressure, 66% had fetal heart tones assessed, 0% had a recorded heart rate, 41% had a temperature taken. Between admission and discharge, 53% had an assessment of blood pressure, 46% had an assessment of fetal heart tones, 12% had a heart rate recorded, 43% had a temperature taken, and 40% had an assessment of bleeding after delivery. Overall maternal assessments increased in all areas except for heart rates assessed on admission (Please see tables 1.1 and 1.2 below). This is speculated to be from elements adapted from the Indian Ministry of Health's SCC, which does not provide a location for charting heart rates upon admission. Soon after implementation of the SCC, a Gujarati translation of the SCC was provided. The Gujarati SCC unfortunately did not provide a designated place for charting maternal heart rates except for the partograph, which many nurses state they do not feel confident using.
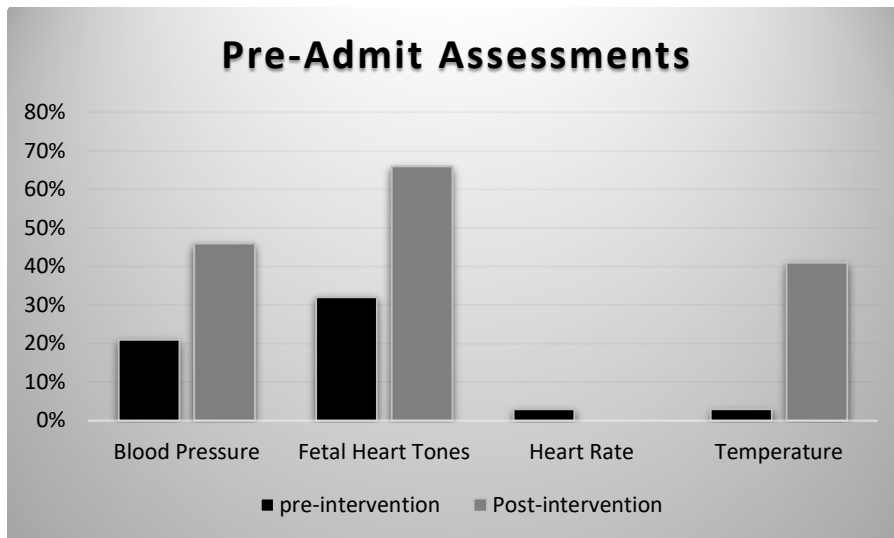
[Table 1.2]
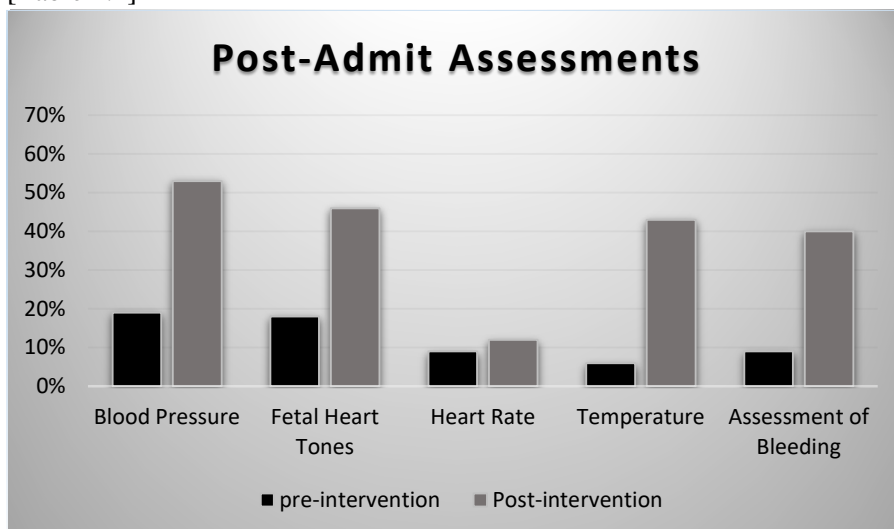
[Table 1.3]

Statistical analysis with Fisher's Exact Test for Count Data indicated there was significant difference in the number of maternal assessments being performed post intervention when compared to the number of assessments being performed during the months leading up to the intervention in all areas ($p<0.01$), except for maternal heart rates ($p>0.05$) (see appendix D).

Discussion

India's substantial increase in facility-based deliveries has not resulted in the anticipated decrease in MMR. As the literature indicates, this is in part due to the lack of training and

education of trained birth attendants in these facilities (Das et al., 2017; Carnahan, 2016). Our

results indicate that this holds true in a rural community health center in Gujarat, India. Data

collection reveals that on average, approximately 12% of mothers receive a full assessment

including evaluation of blood pressure, heart rate, temperature, and fetal heart tones on

admittance to the community health center for delivery. Many bedside nurses declare they have

not received training in basic skills such as assessing for postpartum hemorrhage and pre-

eclampsia, with even fewer stating they feel confident in these skills. If bedside nurses are not

receiving training and opportunities to practice skills to prevent the leading causes of maternal

mortality, hemorrhaging and eclampsia, maternal mortality cannot be expected to decrease.

However, our research demonstrates that interventions including implementation of a validated

tool to promote adherence to evidence based care, training of frontline caregivers in maternal

assessment skills, and hands-on and on-site clinical coaching can decrease knowledge gaps and

improve care. On average, overall maternal assessments have increased by more than three-fold

after implementation of interventions.

As the literature suggests, by improving the skills and knowledge of frontline caregivers

we can improve maternal outcomes. While this study is in the beginning phases of improving

caregiver skills and knowledge, data collection indicates that maternal care is improving starting

with an increase in frequency of maternal assessments. Future PDSA cycles will indicate

sustainability of the results.

Limitations

Limitations of this project include the small sample size and language barriers. This rural

hospital setting takes into account the experiences and output of only ten bedside nurses. To

further validate findings, future studies should aim to include larger sample sizes of bedside

nurses by increasing the number of rural facilities evaluated throughout India. However, the

homogenous responses and output of nurses from a variety of educational backgrounds indicate

that these results are likely reproducible.

Language barriers also created challenges for accurate data collection and effectiveness

of the trainings implemented. This barrier was minimized through the use of on-site interpreters

who interpreted into the native language of Gujarati. A limitation to this study was that foreign

students were the leaders and teachers in the clinical coaching and trainings given. Ideally, focus

should be given to training local nursing care leaders to provide continuous education and quality

improvement to peers so that progress may continue and be maintained after students leave.

Head nurses were identified and the OBGYN was trained in providing clinical coaching in an

effort to overcome this barrier, but strengthening bedside staff in leadership capacity is still in the

beginning stages. Foreign observers and teachers also create the risk of the Hawthorne or

observer effect. Behaviors were likely calculated and modified due to a known observer. By

training local leaders for future assessments and education, the observer effect can be minimized.

When local staff that are already routinely in the delivery room are performing the official

observations, it will be less obvious to participants when observations are taking place.

Conclusion

Results of this study provide preliminary evidence that significant gaps in knowledge and

obstetric care among frontline nurses in rural India has contributed to high and stagnant maternal

mortality. Initial phases of implementation of a validated checklist, trainings in maternal

assessment, and clinical coaching have decreased knowledge gaps while improving care. Results

indicate that improving the knowledge and skills of bedside nurses in rural India has high

potential for improving MMR. However, to truly see a budge in stagnant MMR throughout

India, large scale education initiatives will be needed. These interventions can be costly and time consuming, but are of high priority if we aim to decrease maternal morbidity and mortality throughout India. Steps moving forward include continuation of a series of training interventions focused on capacity building of frontline care givers and implementation of the SCC at this rural health center in Gujarat as well as expansion into more rural health centers throughout Gujarat.

Acknowledgments

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Appendix A

The Adapted Safe Childbirth Checklist:

Before Birth | SAFE CHILDBIRTH CHECKLIST

Registration No. ....

CHECK-1 On Admission	
	Record temperature of mother:............................
	Record BP of mother:...
	Heart Rate of mother: ....
	Record Fetal Heart Rate (FHR): ....

	Notify OB or refer to Higher centre if any of the following danger signs are present. Mention reason and given treatment on transfer note:
Does Mother need referral? ☐ Yes, organized ☐ No	☐ Vaginal bleeding ☐ Severe abdominal pain ☐ High fever ☐ History of heart disease or other major illnesses ☐ Severe headache or blurred vision ☐ Convulsions ☐ Difficulty in breathing
Partograph started? ☐ Yes ☐ No, will start when ≥ 4 cm	Start when cervix ≥4 cm, then cervix should dilate ≥1 cm/hr • Every 30 min: Plot maternal pulse, contractions, FHS and colour of amniotic fluid • Every 4 hours: Plot temperature, blood pressure, and cervical dilation in cm
NO OXYTOCIN/ other uterotonics for unnecessary induction/ augmentation of labor	
Does Mother need • Antibiotics? ☐ Yes, given ☐ No	Give antibiotics to Mother if: ☐ Mother's temperature ≥38°C (100.5°F) ☐ Foul-smelling vaginal discharge ☐ Rupture of membranes >12 hrs without labour or >18 hrs with labour ☐ Labour >24 hrs or obstructed labour ☐ Rupture of membranes <37 wks gestation
• Inj. Magnesium Sulfate? ☐ Yes, given ☐ No	Mother has systolic BP ≥140 or diastolic ≥90 with proteinuria trace to +2 along with any: ☐ Presence of: ☐ Convulsions • Severe headache • Pain in upper abdomen ☐ Increase in BP to • Blurring of vision Systolic≥160 or diastolic • Oligouria (passing <400 ≥110 with +3 proteinuria ml urine in 24 hrs) • Difficulty in breathing
Corticosteroid ☐ Yes, given ☐ No	Give corticosteroids in antenatal period (between 24 to 34 weeks) to mothers if: ☐ True pre-term labour ☐ Conditions that lead to imminent delivery like APH, Preterm Premature ROM, Severe PE/E Dose: Inj. Dexamethasone 6 mg IM 12 hourly - total 4 doses
HIV status of the mother: ☐ Positive ☐ Negative	If HIV+ and in labour: ☐ If mother is on ART, continue same ☐ If not on ART, start ART ☐ If ART is not available, start Nevirapine prophylaxis and referimmediately after delivery to ICTC for further HIV management.
☐ **Follow Universal Precautions**	If HIV status unknown: ☐ Recommend HIV testing
Encouraged a birth companion to be present during labour and until discharge ☐ Yes ☐ No	
Are soap, water, gloves available? ☐ Yes, I will wash hands and wear gloves for each vaginal exam ☐ No, supplies arranged	
☐ **Confirm mother or companion will call for help during labour if needed**	Explain to call for help if there is: • Bleeding • Severe abdominal pain • Difficulty in breathing • Severe headache or blurring vision • Urge to push • Can't empty bladder every 2 hours	Counsel Mother and Birth Companion on: • Support to cope up with labour pains • No bath/oil for baby • No Pre-Lacteal feed • Initiate breastfeeding in half-an-hour • Clothe and wrap the baby
Name of Provider: ....Date: .... Signature:	

CHECK-2 Just Before and During Birth (or C-Section)

		Record temperature of mother:............................ Record BP of mother:... Heart Rate of mother: .... Record Fetal Heart Rate (FHR): ....

Does Mother need:
- *Antibiotics?*

☐ Yes, given
☐ No

Give antibiotics to Mother if any of the following are present:

☐ Mother's temperature ≥38°C or 100.5°F

☐ Foul-smelling vaginal discharge

☐ Rupture of membranes >18 hrs with labour

☐ Labour >24 hrs or obstructed labor now

☐ Cesarean section

- *Inj. Magnesium sulfate?*

☐ Yes, given
☐ No

Mother has systolic BP ≥140 or diastolic ≥90 with proteinuria trace to +2 along with any of:

☐ Presence of:
- Severe headache
- Pain in upper abdomen
- Blurring of vision
- Oligouria (passing <400 ml Urine in 24 hrs)
- Difficulty in breathing

☐ Convulsions
☐ Increase in BP to systolic ≥160 or diastolic ≥110 with +3 proteinuria

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☐ **Skilled assistant identified and ready to help at birth if needed**

Confirm essential supplies are at bedside/labour room:
For Mother
☐ Gloves
☐ Soap and clean water
☐ Oxytocin 10 units in syringe
☐ Pads for mother

Prepare to care for mother immediately after birth of baby (AMTSL)*

☐ Confirm single baby only (rule out multiple babies)

☐ Give inj. oxytocin 10 units IM within 1 minute

☐ Do controlled cord traction to deliver placenta

☐ Examine Placenta for completeness (all Cotyledons and Membranes)

Massage uterus after placenta is delivered. Uterus is: SOFT   FIRM

Episiotomy: ☐ YES ☐ NO

Tears: ☐ YES ☐ NO   **Lidocaine used:** ☐ YES ☐ NO

Fundal Pressure: ☐ YES ☐ NO

Cord Clamped: ☐ Before 2 minutes   ☐ After 2 minutes

For Baby
☐ Two clean dry, warm towels
☐ Sterile scissors/blade to cut cord
☐ **Manual mucus extractor**
☐ Cord ligature
☐ Bag-and-mask
☐ Vit. K
　Given: ☐ YES ☐ NO

Prepare to care for baby immediately after birth
Dry baby, wrap, and keep warm
If not breathing: clear airway and stimulate
If still not breathing:
- Cut cord
- Ventilate with bag-and-mask
- Call for help

☐ **KMC and breast feeding before leaving delivery room**

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*AMTSL - Inj. Oxytocin 10 units IM given within one minute of birth of baby? ☐ Yes ☐ No

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Breast Feeding initiated in first half-an-hour of birth.   ☐ Yes ☐ No

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*AMTSL - Active Management of Third Stage of Labour

Name of Provider: ....Date: .... Signature: ....

After Birth | SAFE CHILDBIRTH CHECKLIST

Registration No. ....

CHECK-3 Soon After Birth (within 1 hour)	
Assessing: -Blood Pressure -Bleeding -Breast Feeding	Record temperature of mother:........................... Record BP of mother:.. Heart Rate of mother: .... Record temperature of baby:............................... Record respiratory rate of baby:......................... Record HR of baby:... ... ...
Is Mother bleeding too much? ☐ Yes: shout for help, refer if needed or treat if facilities available ☐ No	Uterine Tone: SOFT FIRM If bleeding 500 ml, or 1 pad soaked in <5 min: • Call for help, massage uterus, start oxygen, start IV fluids, start oxytocin drip 20 units in 500 ml of RL@40-60 drops/min, treat cause. • If placenta is incomplete: remove any visible pieces, and refer immediately. • If placenta not delivered or completely retained, give IM or IV Oxytocin, stabilize, and refer.
Does Mother need: • *Antibiotics?* ☐ Yes, given ☐ No	Give antibiotics to mother if manual removal of placenta is performed, or if mother's temperature ≥38°C (≥100.5°F) and any of: ☐ Chills ☐ Foul-smelling vaginal discharge ☐ Lower abdominal tenderness ☐ Rupture of membranes >18 hrs during labour ☐ Labour was >24 hours

• *Inj. Magnesium sulfate?*
☐ Yes, given
☐ No
	Mother has systolic BP ≥140 or diastolic ≥90 with proteinuria trace to +2 along with any of:
	
	☐ Presence of:
	    • Severe headache
	    • Pain in upper abdomen
	    • Blurring of vision
	    • Oligouria (passing <400 ml Urine in 24 hrs)
	    • Difficulty in breathing
	☐ Convulsions
	☐ Increase in BP to systolic ≥160 or diastolic ≥110 with +3 proteinuria

Does Baby need: *Antibiotics?* ☐ No ☐ Yes, given	Give baby antibiotics if antibiotics were given to mother, or if baby has any of: ☐ Breathing too fast (>60/min) or too slow (<30/min) ☐ Chest in-drawing, grunting ☐ Convulsions ☐ Looks sick (lethargic or irritable) ☐ Too cold (baby's temp <36°C and not rising after warming) ☐ Too hot (baby's temp >38°C) ☐ Excessive crying
Referral? ☐ No ☐ Yes, organized	Refer baby to NICU or higher centre if: • Any of the above (Indications for antibiotics) • Baby looks yellow, pale or bluish
• Special care and monitoring? ☐ Yes, organized ☐ No	Arrange special care/monitoring for baby if any of the following is present: ☐ Preterm baby ☐ Birth weight <2500 gms ☐ Needs antibiotics ☐ Required resuscitation
• *Syrup Nevirapine?* ☐ Yes, given and will continue up to 6 w ☐ No	Give if mother is HIV+
☐ **Started Breast Feeding.** Explain that colostrum feeding is important for baby. **Baby Latching well:** ☐ YES ☐ NO, requires further teaching ☐ **Started skin-to-skin contact** (if mother and baby well) and KMC in pre-term and low-birth weight babies. ☐ **Explain the danger signs** and confirm mother/companion will call for help if danger signs present.	

After Birth | SAFE CHILDBIRTH CHECKLIST

CHECK-4 Before Discharge

	Record temperature of mother:............................
	Record BP of mother:...
	Record HR of mother: ....
	Record temperature of baby:...............................
	Record respiratory rate of baby:........................
	Record HR of baby:… … … … … … … … … … … …

Is Mother's bleeding controlled?
☐ Yes
☐ No: treat, observe and refer to higher centre if needed

Does mother need antibiotics? ☐ Yes, give and delay discharge ☐ No	Give antibiotics to mother if mother has temperature ≥38°C or ≥100.5°F with any of: ☐ Chills ☐ Foul-smelling vaginal discharge ☐ Lower abdominal tenderness
Does baby need antibiotics? ☐ Yes: give, delay discharge and refer to NICU or higher centre ☐ No	Give baby antibiotics if baby has any of: ☐ Breathing too fast (>60/min) or too slow (<30/min) ☐ Chest in-drawing, grunting ☐ Convulsions ☐ Looks sick (lethargic or irritable) ☐ Too cold (baby's temp <36°C and not rising after warming) ☐ Too hot (baby's temp >38°C) ☐ Stopped breastfeeding ☐ Umbilical redness extending to skin or draining pus

Is baby feeding well?
☐ Yes, encourage mother for exclusive breastfeeding for 6 months.
☐ No: help mother, delay discharge, refer to higher centre if needed.
   Has baby passed stool: YES   NO

Does baby have yellow palms or feet?
☐ YES, check bilirubin
☐ No, safe for discharge

☐ Discuss and offer family planning options to mother
☐ Explain the danger signs and confirm mother/companion will seek help/ come back if danger signs are present after discharge
☐ Arrange transport to home and follow-up for mother and baby

Thank mother for availing services from you

Danger Signs:

Mother has any of:	Baby has any of:
• Excessive bleeding • Severe abdominal pain • Severe headache or visual disturbance • Breathing difficulty • Fever or chills • Difficulty emptying bladder • Foul smelling vaginal discharge	• Fast/difficulty breathing • Fever • Unusually cold • Stops feeding well • Less activity than normal • Whole body becomes yellow

Name of Provider: ....Date: .... Signature: ....

Appendix B

Pre and Post-Test:

RR=Respiratory Rate   BP=Blood Pressure   T=Temperature

1. Which of the following vital signs might indicate infection:
   A. BP 130/90; HR 97; T 97.9; RR 14
   B. BP 120/80; HR 115; T 102.2; RR 22
   C. BP 118/78; HR 74; T 99.1; RR 16
   D. BP 95/65; HR 95; T 98.3; RR: 18

2. Which of the following vital signs might indicate Pre Eclampsia:
   A. BP 145/85; HR 89; T 98.1; RR 16
   B. BP 130/82; HR 102; T 101.1; RR 22
   C. BP 108/72; HR 112; T 102; RR 12
   D. BP 95/53; HR 75; T 97.9; RR 16

3. A patient has a BP of 162/98 what are the next steps?
   A. Notify the doctor and recommend a urine test for protein
   B. Ask the mother if she has a headache, blurred vision, or has had convulsions
   C. Take the mother to the ward and recheck BP in 2 hours
   D. Both A and B

4. Is this True or False: Pre Eclampsia can start after birth of the baby.
   A. True
   B. False

5. What is a method of estimating gestational age without a LMP or antenatal care record?
   A. If she waddles when she walks
   B. Leopold's maneuvers
   C. Measuring fundal height with a tape measure
   D. How much weight she has gained
   E. The width of her abdomen

6. Is this True or False: If a vital sign is within normal range it does not need to be recorded.
   A. True
   B. False

7. Which FHS is normal:
   A. 180
   B. 150
   C. 90
   D. 55

Appendix C

Aptitude Survey:

INDIVIDUAL ASSESSMENT OF EMERGENCY OBSTETRIC CARE

Date of individual assessment:	
What are your educational qualifications?	
When did you complete your education?	
What is your role at the health facility?	

Skills - Think about your skills for caring for mothers and babies as you answer the questions below	
1. Have you received training in this topic?	YES or NO ?
2. Have you performed the skill in the past 6 months?	YES or NO?
3. Do you feel confident in this skill?	YES or NO?

Normal Labor	**Received Training?**	**Performed in past 6 months?**	**Do you feel confident with this skill?**
	YES or NO	**YES or NO**	**YES or NO**
Assess the fetal position			
Auscultate fetal heart tones			
Determine gestational age of fetus			
Measurement of fundal height			
Determining position of baby with abdominal palpation			
Assess cervical dilation in labor			
Assess progress of labor			
Using a partograph			
Obtain maternal vital signs			
Manage normal labor			
Manage normal birth of baby			
Manage normal birth of placenta			
Examine the placenta for completeness			
Check uterine tone after birth			
Perform normal newborn care			
Measure newborn vital signs			
Provide respectful maternity care			
Procedures for Labor and Delivery	**Received Training?**	**Performed in past 6 months?**	**Do you feel confident with this skill?**
Perform an amniotomy (rupture bag of water)			
Perform local anesthesia of perineum			
Make and repair an episiotomy			
Repair first degree tears			
Repair second degree tears			
Repair third or fourth degree tears			
Repair a cervical tear			
Labor & Birth Complications	**Received Training?**	**Performed in past 6 months?**	**Do you feel confident with this skill?**
Perform newborn resuscitation (HBB)			
Manage bleeding in late pregnancy			
Manage bleeding in labor			

Recognize too much bleeding after birth (PPH)			
Manage post-partum hemorrhage			
Perform bimanual compression			
Perform abdominal aortic compression			
Recognize signs of pre-eclampsia			
Manage pre-eclampsia			
Manage eclampsia			
Recognize a shoulder dystocia			
Perform maneuvers for shoulder dystocia			
Manage a fever before delivery (amnionitis)			
Manage a fever after delivery (endometritis)			
Manage ABNORMAL early labor (latent phase)			
Manage ABNORMAL active labor (first stage)			
Manage ABNORMAL pushing stage (second stage)			
Manage ABNORMAL placenta stage (third stage)			
Manually remove a retained placenta			
Induce or augment labor			
Manage labor after prior cesarean section			
Abnormal Presentations	**Received Training?**	**Performed in past 6 months?**	**Do you feel confident with this skill?**
Recognize breech presentation			
Manage a breech delivery			
Manage a transverse presentation			
Manage a prolapsed cord			
Manage twin delivery			
Post-Delivery Contraception & Breastfeeding	**Received Training?**	**Performed in past 6 months?**	**Do you feel confident with this skill?**
Fully assess postpartum mother prior to discharge			
Fully assess postpartum baby prior to discharge			
Provide family planning counseling			
Provide assistance with breastfeeding			
What helps you feel successful in your work?			
What do you see as barriers to success in your work?			
What ideas do you have for improvement of maternal newborn care at the facility?			
Are you interested in training to strengthen your maternal newborn care skills?			**YES or NO**
What additional training or skills would you like? What will be most helpful to impove the quality of care for mothers and infants?			

Appendix D

	Fisher's Exact Test for Count Data: Pre and Post-Intervention Chart Reviews		
	Intervention:		P-Value:
	Pre-intervention	Post-intervention	
	Blood Pressure on Admit		
Yes:	20	38	0.0007
No:	74	45	
	Fetal Heart Tones on Admit		
Yes:	30	55	0.000005567
No:	64	28	
	Heart Rate on Admit		
Yes:	3	0	0.2487
No:	91	83	
	Temperature on Admit		
Yes:	3	34	0.0000000002187
No:	91	49	
	Blood Pressure After Admit		
Yes:	18	44	0.0000035
No:	76	39	
	Fetal Heart Tones after Admit		
Yes:	17	38	0.00008589
No:	77	45	
	Heart Rate after Admit		
Yes:	8	10	0.4652
No:	86	73	
	Temperature after Admit		
Yes:	6	36	0.000000004372
No:	88	47	
	Assessment of Bleeding		
Yes:	8	33	0.000000809