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Role of 7.1% Chlorhexidine Digluconate in Prevention of Newborn Sepsis



One-Day Orientation for Skilled Birth Attendants (SBAs) and Lady Health Workers (LHWs)

Department of Health, Government of Sindh
2014

Department of Health
Sindh Province, Pakistan
2014

This training package was adapted from the *7.1% Chlorhexidine Digluconate w/v Training Manual* developed by Family Health Division/Child Health Division, Department of Health Services, Ministry of Health and Population, Government of Nepal. It has been endorsed by the Department of Health, Sindh Province, and printed by the Maternal, Newborn and Child Health Services Component of USAID/Pakistan's Maternal and Child Health Program.

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TABLE OF CONTENTS

INTRODUCTION	1
7.1 % Chlorhexidine Digluconate Gel	1
Chlorhexidine Introduction and Scale up	1
Chlorhexidine Initiative Goal	1
CHLORHEXIDINE ORIENTATION	2
Objective.....	2
Expected Outcomes	2
Orientation Curriculum	2
Orientation Methodology	2
Orientation Materials	2
Evaluation	2
Orientation Agenda	3
Lesson Plan	4
Notes.....	7
Causes of Neonatal Mortality.....	7
Introduction to Chlorhexidine and its Importance	7
Application Procedure of Chlorhexidine	7
Role and Responsibilities of SBAs.....	7
Role and Responsibilities of Lady Health Workers (LHWs)	8
Recording and Reporting.....	8
Frequently Asked Questions.....	8
APPENDIX A: THE TALE OF TWO NEWBORNS IN THATTA DISTRICT	10
APPENDIX B: ESSENTIAL NEWBORN CARE JOB AID	11
APPENDIX C: CHLORHEXIDINE JOB AID	12
APPENDIX D: HANDWASHING JOB AID	13
APPENDIX E: SKILLS CHECKLIST FOR CHLORHEXIDINE APPLICATION	14

Role of 7.1% Chlorhexidine Digluconate in the Prevention of Newborn Sepsis: A One-Day Orientation for Skilled Birth Attendants (SBAs) and Lady Health Workers (LHWs)

INTRODUCTION

Neonatal mortality is still high in Pakistan at 55 neonatal deaths per 1000 live births (DHS 2012–13). Each year, approximately 202,000 newborns die within 28 days of birth in Pakistan (UNICEF 2013). The majority of these newborn deaths are from preventable or treatable causes: infections, complications at birth and complications of prematurity. The second most common killer of newborns is infections; sepsis (blood infection), pneumonia (lung infection) and meningitis (infection of lining of brain).

Every three minutes a newborn baby dies in Pakistan. Most of these deaths are in the first week of life and are preventable.

7.1% chlorhexidine digluconate is a low-cost antiseptic that prevents umbilical cord infections. Research in Pakistan found it reduced newborn mortality by 38%.
(Save the Children 2013)

7.1 % Chlorhexidine Digluconate Gel

Chlorhexidine digluconate 7.1% w/v gel (hereafter referred to as chlorhexidine) is a broad spectrum antiseptic that is safe and effective for reducing bacterial colonization on the skin and umbilical stump of newborns.¹ Research evidence shows that application of chlorhexidine on the umbilical cord immediately after cord cutting helps prevent infection by 68% and reduces neonatal mortality by 23%.

Chlorhexidine Introduction and Scale up

In March 2014, Sindh's Department of Health (DOH)—in consultation with a technical committee—approved the distribution and use of 7.1% chlorhexidine for umbilical cord care. The decisions included:

- Chlorhexidine is recognized as an efficacious, acceptable, feasible, and cost-effective newborn care intervention for prevention of newborn infection.
- Chlorhexidine will be procured and distributed as a gel formulation of 7.1% chlorhexidine digluconate (delivering 4% chlorhexidine) in Sindh Province.
- Because of chlorhexidine's significant residual antiseptic effect for 24 to 48 hours, it targets the most important period to prevent newborn infections and deaths. In Sindh, a single application immediately after birth (one day versus daily for multiple days) will be promoted because this application regimen is simpler and more likely to result in high coverage.
- Chlorhexidine will be introduced, used, and distributed in at the community level and in health facilities across Sindh. Chlorhexidine will be: included in the LHWs/CMWs clean delivery kit; distributed by LHWs/CMWs to pregnant women during the last trimester of pregnancy; and stocked at all health facilities.

Chlorhexidine Initiative Goal

- To reduce neonatal morbidity and mortality

¹ In Sindhi language, the umbilical stump is referred to as “Dunn”

CHLORHEXIDINE ORIENTATION

Objective

- To build SBA and LHW capacity to apply chlorhexidine for umbilical cord care

Expected Outcomes

At the end of this orientation, the participants will be able to do the following:

- State the importance of chlorhexidine and its role in preventing umbilical cord infection
- Demonstrate counseling skills regarding essential newborn care and chlorhexidine to pregnant women (and associate family members) at eight months of pregnancy
- Properly demonstrate the 11 steps of handwashing
- Demonstrate the proper application procedure of chlorhexidine using a doll

ORIENTATION CURRICULUM

This is a one-day orientation for SBAs and LHWs, which includes: evidence for chlorhexidine; causes of neonatal mortality in Pakistan; application of chlorhexidine (including counseling and handwashing); chlorhexidine-related roles and responsibilities of SBAs and LHWs; chlorhexidine distribution mechanism; and recording and reporting system.

Orientation Methodology

This is a participatory training uses discussion, demonstration, hands on practice, question/answer, observation and role play.

Orientation Materials

- Chlorhexidine tube
- Chlorhexidine job aids (see Appendix B and Appendix C)
- Baby doll
- Printed copies of manual

Evaluation

The orientation will end with a skills review of all participants (Appendix E), a question/answer period and discussion. All participants must correctly demonstrate all steps of chlorhexidine application.

ORIENTATION AGENDA

CHLORHEXIDINE ORIENTATION (TOTAL DURATION 5 HOURS)		
TIME	CONTENTS	RESPONSIBLE
9:00AM–9:10AM	Registration	
9:10AM–9:20AM	Introductions	
9:20AM–9:30AM	Welcome and overview of the chlorhexidine initiative	
09:30AM–09:40AM	Objective of the chlorhexidine orientation	
9:40AM–10:00AM	The neonatal situation of Pakistan	
10:00AM–10:20AM	Counseling about the five Essential Newborn Care (ENC) messages	
10:20AM–10:50AM	Introduction to chlorhexidine and its importance in preventing umbilical cord infection	
10:50AM–11:05 AM	Tea break	
11:05AM–12:00PM	Handwashing technique	
12:00PM–01:00PM	Practical sessions on application procedures	
12:20PM–12:30PM	Role of SBAs and LHWs	
12:40PM–1:10PM	Recording and reporting	
1:10PM–1:35PM	Skills assessment, discussion, and orientation closing	
1:35PM–2:00PM	Refreshment	

For health facility level training, a PowerPoint presentation will be used.

For community level training, printed copies will be used.

LESSON PLAN

CHLORHEXIDINE ORIENTATION (TOTAL DURATION 5 HOURS)				
Time	Objective	Contents	Training Activity/ Method	Tools
10 minutes	Register participants (names)	Registration	Register names of participants	Register, copy, and pen
10 minutes	Introduce participants and facilitator to each other	Introduction	The participants and facilitators introduce themselves describing about their current work and responsibility.	
10 minutes	Welcome participants	Welcome	<ul style="list-style-type: none"> ▪ Welcome the participants/guests ▪ Give overview of the chlorhexidine initiative, and expected outcome of the orientation <p><i>Note: The orientation can be formal/informal according to the setting.</i></p>	
10 minutes	Explain the objective of chlorhexidine orientation	Objective of the orientation	The facilitator reads out objective of the orientation prepared on a newsprint	Printed copies/PowerPoint: objective of the chlorhexidine orientation
20 minutes	Understand the neonatal health situation in Pakistan	Neonatal situation in Pakistan	<ul style="list-style-type: none"> ▪ Read the story (Appendix A) to the group ▪ Ask the participants about neonatal health situation in their community Ask the participants about traditional cord care practices prevalent in the community. Inform about the ill effects of those practices on neonatal health ▪ Ask if the participants have heard/seen neonatal death in the past six months in their community. If yes, probe about the cause of death ▪ Discuss about four major causes of neonatal mortality written on a flip chart or show PowerPoint ▪ Compare the answers given by the participants and the points written on the flipchart ▪ Relate chlorhexidine and umbilical cord care with major causes of neonatal mortality including umbilical cord infection 	Story (Appendix A) Printed copies/PowerPoint: Neonatal health situation in Pakistan

CHLORHEXIDINE ORIENTATION (TOTAL DURATION 5 HOURS)				
Time	Objective	Contents	Training Activity/ Method	Tools
20 minutes	State five essential newborn care messages	Review about five essential newborn care messages	<ul style="list-style-type: none"> ▪ Discuss about five essential newborn care messages (Appendix B) ▪ Relate use of chlorhexidine immediately after cord cutting and apply nothing else on the cord followed by dry cord care 	Job aid (Appendix B)
20 minutes	Understand what is chlorhexidine and its importance	Introduction to chlorhexidine and its importance	<ul style="list-style-type: none"> ▪ Distribute one tube of chlorhexidine to each participant ▪ Ask the participants to carefully observe the tube and see the pictorial instruction sheet inside the tube. Ask them what they have understood ▪ Mention in detail about chlorhexidine its need, importance, application procedure and advantage 	Chlorhexidine tube
55 minutes	Review handwashing technique	Handwashing technique	<ul style="list-style-type: none"> ▪ Ask if the participants remember the 11 step handwashing technique and necessary preparations to be done before hand-washing 	Soap and water, job aid (Appendix D)
1 hour	Learn how to apply chlorhexidine on the umbilical stump	Chlorhexidine application procedure on the umbilical cord stump	<ul style="list-style-type: none"> ▪ Demonstrate the application procedure of chlorhexidine on the umbilical cord stump of a baby doll ▪ Divide the participants into different groups and give one doll to each group for role plays ▪ Ask them to act out as a pregnant woman and LHW or SBA. The SBA or LHW is supposed to counsel the pregnant woman and apply chlorhexidine on the doll. After all the participants have applied chlorhexidine, ask if they have any queries 	Doll and chlorhexidine packet, CHX job aid (Appendix C)
10 minutes	Understand the role and responsibilities of SBAs and LHWs in chlorhexidine program	Role and responsibilities of SBAs and LHWs in chlorhexidine program	<ul style="list-style-type: none"> ▪ Discuss with the participants the roles and responsibilities of SBAs and LHWs. Note down important points generated by discussion on a newsprint ▪ Display on a flipchart the roles and responsibilities of SBAs and LHWs from this manual 	Roles and responsibilities of SBAs and LHWs written on a newsprint
30 minutes	Understand the recording and reporting system for chlorhexidine	Recording and reporting	<ul style="list-style-type: none"> ▪ Explain the recording and reporting forms of chlorhexidine 	SBA/LHW reporting forms and formats, pencil and

CHLORHEXIDINE ORIENTATION (TOTAL DURATION 5 HOURS)				
Time	Objective	Contents	Training Activity/ Method	Tools
			<ul style="list-style-type: none"> ▪ Mention correct way to fill up the form ▪ Make them practice to fill up the forms 	eraser
25 minutes	Participants will be assessed and their feedback will be collected	Skills assessment, discussion, and closing of the chlorhexidine orientation	<ul style="list-style-type: none"> ▪ Assess each participant as they apply chlorhexidine on the doll following the steps of the job aid ▪ Ensure t proper understanding of contents by the participants ▪ Close the orientation by thanking all the individuals who have supported the chlorhexidine orientation. Also request all the participants to apply knowledge into practice. 	Appendix E Skills checklist

NOTES

Causes of Neonatal Mortality

According to PDHS 2006–2007 in Pakistan, following are the four main causes of neonatal mortality:

1. Infection
2. Birth asphyxia
3. Low birth weight/prematurity
4. Hypothermia

Introduction to Chlorhexidine and Its Importance

- Chlorhexidine digluconate is an antiseptic.
- This antiseptic gel is to be used only on the umbilical area of neonates and is to be used immediately after cord cutting in the umbilical stump and surrounding area.
- A single application of all content of the tube is sufficient.
- Application of chlorhexidine gel helps prevent bacterial infection for a long period of time (24–48 hours).
- Use of chlorhexidine gel has no side effects.
- It is easy to use.
- Use of chlorhexidine is helpful in replacing other harmful traditional cord care practices.

Application Procedure of Chlorhexidine

- Wash hands properly with soap and water before piercing the tube, following all 11 steps of proper handwashing.
- Use sharp protuberance of the lid to pierce tube. Before applying chlorhexidine, ensure the baby is warm and is wrapped properly exposing only the naval area.
- Apply chlorhexidine immediately after cord cutting. Use chlorhexidine gel on umbilical stump and spread it using index finger around the abdominal area that comes in contact with umbilical stump.
 - A single application is enough.
 - Gel takes 2–3 minutes to dry. Cover it with light clothes to avoid wiping.
 - Place baby in Kangaroo Mother Care (KMC) after the gel has dried.

Role and Responsibilities of SBAs

- Participate in the chlorhexidine training program.
- Provide information regarding chlorhexidine to all relevant labor room and delivery staff.
- Provide counseling to pregnant women and their families during ANC visits regarding chlorhexidine and how to avoid harmful umbilical cord care practices.
- Distribute chlorhexidine with IEC materials to pregnant women during ANC visits in late pregnancy.
- Ensure availability of chlorhexidine in the labor and delivery room.
- If present during delivery (at home or in a health facility), apply chlorhexidine on umbilical cord stump of newborn baby soon after birth with the aseptic technique.
- Keep record of births and chlorhexidine application.
- Track stock of chlorhexidine.

Role and Responsibilities of Lady Health Workers (LHWs)

- Participate in chlorhexidine orientation program.
- Identify pregnant woman in her catchment area.
- Conduct sessions on chlorhexidine in women's support group meetings.
- Provide counseling to pregnant woman and her family regarding chlorhexidine during home visits.
- Provide chlorhexidine to pregnant women during their eighth month of pregnancy after proper counseling.
- Apply chlorhexidine to newborn baby if present during delivery.
- If a delivery is not attended by a skilled attendant, then the LHW should make a home visit to the new mother within 24 hours and check use of chlorhexidine.
- Include information about chlorhexidine in the LHW register.
- Regularly replenish chlorhexidine from health facility to prevent a stock out.
- Record Chlorhexidine application in the pregnant women checklist.
- Submit monthly report on time.

Recording and Reporting

- Received chlorhexidine? Yes (record number in appropriate document)/No
- Used/applied chlorhexidine? Yes (record number in appropriate document)/No

Frequently Asked Questions

When and where chlorhexidine is used?

- Chlorhexidine is used on the umbilical cord stump of a newborn after birth.
- It can be used in any setting where a birth occurs: at home after a home birth or after a delivery in a health facility.

What are its advantages?

- It is preventative. It works before the infection begins. Some infections will not show visible signs of infection at the cord stump.
- It is simple to use. The instructions are simple and have been shown to be easy to follow by mothers, families, community health workers and health care providers (such as skilled birth attendants). It is important to wash hands before use.
- It does not require special storage, such as refrigeration.
- It is equitable—all newborns should receive chlorhexidine immediately after birth.
- It is safe. Chlorhexidine has been used for umbilical cord care in developed countries for 40 years. The concentration of chlorhexidine digluconate was selected because it is strong enough to work as an antiseptic, but at a low enough concentration not to have other effects (i.e., absorption into the bloodstream).
 - This formulation of chlorhexidine is water-based. Many other antiseptics are alcohol-based, which are not recommended for premature babies.
 - As with many medicines intended for topical use, avoid contact with eyes or ears.
- It is very effective, more than other antiseptics. It reduces infections and prevents newborn deaths.

What is its correct application procedure?

- Please refer to the chlorhexidine job aid to follow the correct steps.
- Apply immediately after birth, following these five steps:
 1. Wash hands properly with soap and water before applying chlorhexidine to the baby.
 2. Open the tube by pressing the sharp tip of the lid to break the inner shield of the tube.

3. Apply the chlorhexidine gel on the umbilical cord stump and the surrounding areas of the cord.
4. Spread the gel gently on the stump and surrounding areas using your index finger.
5. After applying chlorhexidine, apply nothing else to the cord stump and keep it clean and dry.

Are there any side effects of chlorhexidine?

- No, there are no side effects of chlorhexidine use for cord care. It has been noted, however, that using chlorhexidine can delay cord separation; however, delayed cord separation with the use of chlorhexidine does not harm the baby.

APPENDIX A: THE TALE OF TWO NEWBORNS IN THATTA DISTRICT²

In neighboring villages of Thatta district of Sindh Province of Pakistan, there were two women who were pregnant at the same time. One woman was named Jameela, and the other was named Sameena. Both Sameena and Jameela had healthy pregnancies, visiting the ANC clinic several times, eating well and taking rest. In the first week of October, they both gave birth to baby girls.

In Jameela's home, her mother-in-law took the responsibility of bathing her newborn granddaughter, then giving her an oil massage and changing the clothes. As has been done in this village for many generations, she applied cow dung on the newborn's umbilical cord stump area. Sameena, however, had learned during pregnancy about the common ways that newborns fall ill during the first few days after birth from the LHW in her village. She was careful to keep the baby dry and warm, and she used a small tube of medicine that the LHW gave her on the baby's umbilical cord stump.

When the LHW visited Sameena at home two days after the birth for a postnatal checkup, the newborn baby girl was in good health. The LHW reminded the family about all the danger signs for newborns and postpartum mothers.

In the other village, Jameela noticed her child's umbilical area had become swollen and red. There also was pus around the area. Fearing someone's evil eye in the family's happiness, Jameela and her husband took their daughter to the local shaman. The shaman could not help. The next day they went to see the nearby LHW, who suspected umbilical cord infection and suggested they quickly take the child to the nearby MNCH Center.

The community midwife (CMW) there identified the problem: it was a local cord infection, probably caused by something applied to the cord stump. The CMW then gave some oral antibiotics and topical medicine (Gentian violet) and asked the parents to come for follow-up visit after a few days. The CMW further advised parents that the cord should be kept clean and dry, and they should not apply anything else to or around the umbilical cord (such as cow dung, mustard oil, turmeric powder, ash etc.) The CMW instructed them to return if any danger signs for newborns and postpartum mothers occurred.

At the end of October, still in the first month of life, both newborn girls were healthy. Both sets of mothers and fathers shared their stories in the next local support group meeting in their respective villages about the dangers of cord infections, and the LHWs talked with all group members about how chlorhexidine can prevent life-threatening newborn cord infections.

² This story is not based on real events, but created for this training to engage participants in analyzing the possible scenarios related to the need for chlorhexidine and key behaviors about cord care and care-seeking for newborns.

APPENDIX B: ESSENTIAL NEWBORN CARE JOB AID



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Five Key Messages of Essential Newborn Care

The following care should be given to all newborn babies



1.
Wipe the baby dry immediately after birth using a soft, clean and dry cloth, and wrap the baby with another dry cloth to keep the baby warm



2.
Apply CHX gel on the cord immediately after cord cutting and keep the cord clean and dry. Apply nothing else on the cord and surrounding areas



3.
Keep the baby in skin to skin contact with the mother



4.
Initiate breast feeding within one hour of birth

5. Delay bathing for at least 24 hours after birth

APPENDIX C: CHLORHEXIDINE JOB AID



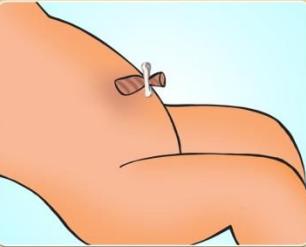
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Chlorhexidine Gel (Dunn Malam)

Use of Chlorhexidine to prevent infection in newborn babies



- Use CHX to prevent cord infection in newborn babies
- Apply CHX immediately after cord cutting
- Use CHX once. A single application is adequate
- Use all the gel of the tube



1. Wash hands properly with soap and water before applying CHX



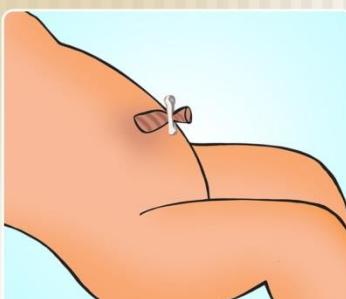
2. Use the sharp point of the top to break the inner shield of the tube



3. Apply the gel on the stump and surrounding areas of the cord



4. Spread the gel gently on the stump and surrounding areas using index finger



5. After applying CHX gel, apply nothing else on the cord. Keep the cord clean and dry

APPENDIX D: HANDWASHING JOB AID

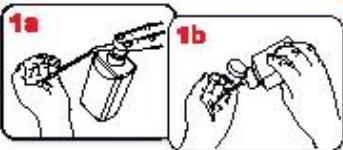


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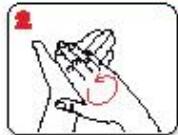


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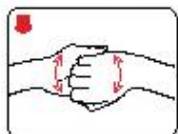
How to handrub? WITH ALCOHOL-BASED FORMULATION



Apply a painful of the product in a cupped hand and cover all surfaces.



Rub hands palm to palm



backs of fingers to opposing palms with fingers interlocked



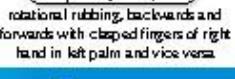
right palm over left dorsum with interlocked fingers and vice versa



palm to palm with fingers interlocked

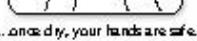


rotational rubbing of left thumb clasped in right palm and vice versa



rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa

20-30 sec



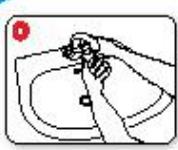
...and dry, your hands are safe.

40-60 sec

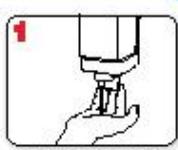


...and your hands are safe.

How to handwash? WITH SOAP AND WATER



wet hands with water



apply enough soap to cover all hand surfaces.



rinse hands with water



dry thoroughly with a single use towel



use towel to turn off faucet



WHO acknowledges the Hôpitaux Universitaires de Genève (HUG),
in particular the members of the Infection Control Programme, for their active participation in developing this material.

World Health Organization

October 2009 version 1.3 9

APPENDIX E: SKILLS CHECKLIST FOR CHLORHEXIDINE APPLICATION

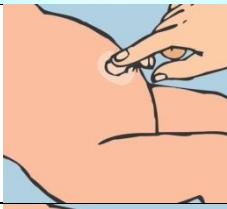
Name of SBA or LHW:

Facility:

Date:

Instructions:

Assess the skills of the SBA or LHW based on the following steps and mark the appropriate box. Allow participants to use the job aid to guide the process, as needed.

STEP		DONE CORRECTLY	DONE INCORRECTLY	NOT DONE
	1. Wash hands properly with soap and water before applying chlorhexidine.			
	2. Use the sharp protuberance of the lid to break the inner shield of the tube.			
	3. Apply 4% chlorhexidine gel on the stump and the surrounding areas of the cord.			
	4. Spread the gel gently on the stump and surrounding areas using index finger.			
	5. After applying chlorhexidine gel, apply nothing else on the cord and keep the cord clean and dry.			

Scoring

Successful completion of the training requires all steps to be completed correctly. Participants should be supported to repeat steps until they perform satisfactorily.

All Steps Done Correctly?	
Facilitator Name and Initials	
Date	