SUPPORTING COMPREHENSIVE CLEFT CARE THROUGH NUTRITION AND FEEDING

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LESSON 1: Strategies to Optimize Breastfeeding for Infants with Cleft Lip/Palate

TARGET AUDIENCE: Hospital Health Staff and Community Health Workers

LEARNING GOALS:

- Participants will learn strategies to maximize breast milk intake for infants with cleft lip/palate.
- Participants will understand cue-based feeding strategies.
- Participants will gain knowledge on the importance of early dental care.

TOPICS:

1. Benefits and Challenges of Providing Breast Milk to Infants with Cleft Lip/Palate
2. Understanding Breast Milk Production
3. Recommendations for Breastfeeding Infants with Cleft Lip/Palate
4. Cue-Based Feeding
5. Infant Dental Health
6. Breast Milk Sharing: Risks, Benefits and Practical Guidance

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Topic	Benefits and Challenges of Providing Breast Milk to Infants with Cleft Lip/Palate		
Learning Objectives	• Participants will understand the importance of breast milk for infants with cleft lip/palate. • Participants will understand the challenges of breastfeeding infants with cleft lip/palate.		
Learning Activity	Description	Time	Materials Needed
	Group discussion on the benefits and challenges of breastfeeding an infant with cleft lip/palate • Introduce topic, share the World Health Organization (WHO) guidelines for breastfeeding, and ask participants to list benefits and challenges of breastfeeding. • Ask participants to call out benefits and challenges. • Write participants' answers on a flip chart corresponding to the category that it falls into. • Expand on answers.	20 minutes	• Flip chart divided into "benefits" and "challenges" • Markers • PowerPoint

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Trainer's Notes	WHO recommends that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond. (WHO/UNICEF, 2003) **Benefits of breastfeeding for infants with cleft lip/palate** • Helps strengthen the muscles around the face and mouth to promote better speech as the infant grows • The breast is more flexible than a bottle nipple for an infant with a cleft lip • An infant has more control over positioning and milk flow. • Natural Substance - less irritating if regurgitates out the nose • Decreases risk of ear infections • Provides the closeness and interaction that many of these infants need - can suckle for comfort, not just food **Challenges of breastfeeding for infants with cleft lip/palate** • Weak suck • Non-rhythmic suck • Swallowing too much air • Trouble maintaining a good seal • Gagging and choking • Milk leaking out of the nose • May tire more easily and not nurse long enough to get the hind milk • May prefer the side without the cleft
Evidence of Learning	Participants will be able to list at least 2 benefits and 2 challenges of providing breast milk directly through breastfeeding or indirectly through pumping.

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Topic	Understanding Breast Milk Production		
Learning Objectives	Participants will be able to explain conditions that increase or decrease breast milk production.		
Learning Activity	Description	Time	Materials Needed
	Small group discussion on factors that increase and decrease breast milk production • Introduce the topic of breast milk production. • Divide participants into groups of 3-5. • Instruct groups to write factors that increase/decrease breast milk production on sticky notes. • Instruct groups to post their sticky notes on the flip chart under "increase" or "decrease." • Synthesize and summarize.	15 minutes	• Sticky notes • Markers • Flip chart with two columns, "increase" and "decrease" • PowerPoint
Trainer's Notes	**What decreases a mother's milk supply?** • Stress • Hormonal or endocrine problems • Using hormonal birth control • Taking certain medications or herbs • Sucking difficulties (infant) • Not feeding at night • Scheduled feedings • Jaundice (infant)		

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	• Supplementation (infant) • Dehydration (mother and infant) **What increases a mother's milk supply?** • Drinking plenty of water • Eating certain foods • Feeding on demand—watch infant's cues • Feeding at least every 1-3 hours • Warm compress on breasts before feeding • Massaging breast before/during feeding • Hand expressing milk before and after a feeding • Skin to skin contact • Relaxation techniques • Expressing milk within first few hours of birth Milk production is a "use it or lose it" process. The more often and effectively an infant nurses, the more milk the mother will make. Research tells us that the emptier the breast, the faster the breast makes milk. So, when an infant removes a large percentage of milk from the breast, milk production will speed up in response. Rather than thinking of nursing or pumping as "pouring milk out of a container" think of it as flipping on the "high speed production" switch! The size of breasts (which indicates storage capacity) does not matter for breast milk production. Think of storage capacity as a cup – you can easily drink a large amount of water throughout the day using any size of cup – small, medium or large – but if you use a smaller cup it will be refilled more often.
Evidence of Learning	Participants will be able to list 2 ways to increase milk supply.

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Topic	Recommendations for Breastfeeding Infants with Cleft Lip/Palate		
Learning Objectives	Participants will be able to counsel mothers on strategies to adequately and efficiently breastfeed infants with cleft lip/palate.		
Learning Activity	Description	Time	Materials Needed
	Orange activity • Cut orange into wedges, leaving the peel on. • Give each participant a napkin, 3 orange wedges, and one straw. • Ask participants to lean their head back and squeeze orange into their mouth to simulate bottle-feeding. • Ask participants to push straw into an orange and suck out juice to simulate breastfeeding with a shallow latch (only drawing in the nipple). • Ask participants to put the third orange slice in their mouth and use their lips and tongue (no teeth) to massage out the juice to simulate a good latch and milk transfer. • Ask participants to share their experience with the orange slices by rating the amount of juice they received out of each orange on a scale from 0-10 (10 being the most juice). • Summarize and expand on activity by sharing recommendations for breastfeeding.	20 minutes	• 1 napkin per participant • 1 orange per participant (or similar juicy fruit) • One straw per participant • Wet wipes

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Trainer's Notes	• Establishing a good latch is an important key to a good breastfeeding relationship. An infant who latches on well, gets milk well. An infant who latches on poorly has more difficulty getting milk, especially if the supply is low. • Bottle or cup feeding requires little work for the infant, besides having a coordinated suck-swallow-breathe complex. Bottle or cup feeding before establishing successful breastfeeding can interfere with a successful breastfeeding relationship. • *Shallow latch*: When infants hang on the nipple, they will not be able to express milk out of glands. A poor latch is similar to giving an infant a bottle with a nipple hole that is too small—the bottle is full of milk, but the infant will not get much of it. An infant who does not get milk easily will usually stay on the breast for long periods. • *Good latch and milk transfer*: An asymmetrical latch (an infant should have more areola in his/her mouth on the bottom and less on top) is necessary so the tongue, lips, and gums can massage the milk out of the glands. Adequate suction is important for milk transfer.		
Learning Activity	Description	Time	Materials Needed
	Demonstration of feeding positioning Using an infant doll, demonstrate various feeding positions that work best for infants with cleft lip/palate and then allow participants to practice: • Modified cradle hold • Cleft-modified football hold • Dancer hand position	30 minutes	• Infant doll

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Trainer's Notes	**Breastfeeding strategies for an infant with cleft lip and/or palate:** ● Feed often—at least every 2 hours. ● Sit upright and position infant upright. ● Apply a warm compress before breastfeeding using a warm, damp towel or a hot water bottle. ● Massage breasts before breastfeeding. ● *For unilateral cleft*: position nipple away from cleft in a modified cradle hold. ● *For bilateral cleft*: position infant upright, face-to-face with cleft-modified football hold. ● *For a weak latch*: position infant in a dancer hand position (infant's chin rest on the web between the thumb and pointer finger, which stabilizes the jaw, and the rest of the fingers are wrapped under the breast. The other hand supports the infant's neck and/or shoulders). ● Press infant into breast to encourage latch since no suction. ● Compress breasts during breastfeeding. ● Burp frequently. **Counseling mothers** ● Encourage mothers to provide the protective benefits of breastfeeding. ● Counsel mothers on the likely and realistic breastfeeding expectations for infants with cleft lip/palate. ○ Do not confuse challenges of breastfeeding an infant with cleft palate with common breastfeeding challenges – latching and sputtering. ○ Feedings will take twice as long. ● Encourage mother to try different positions to get best latch. ● Connect mothers with peer support. **Support for infants with cleft lip/palate** ● Evaluate infants on an individual basis. ● Evaluate the size and location of cleft and mother's previous experience with breastfeeding. ● Monitor weight and hydration status closely and supplement as needed.

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	Description	Time	Materials Needed

Learning Activity	**Size of stomach quiz**
	• Give participants 4 index cards labeled:
	  ○ Day 1
	  ○ Day 3
	  ○ Day 7
	  ○ 1 month
	• Introduce activity by explaining that the round objects represent the size of the stomach at different ages.
	• Hold up the round objects, one at a time.
	• Ask participants to raise the index card that is labeled with the age corresponding to the "stomach size." Include extra objects to make the game more challenging.
	• Review answers and facilitate discussion on stomach size.
	• Review Size of a Newborn's Stomach handout with participant.
		15 minutes	• 4 index cards per participant
			• 7 roundish objects
			  ○ Peanut/bean
			  ○ cherry/marble
			  ○ walnut/prune
			  ○ plum/passion fruit/ping pong ball
			  ○ egg/lime/small lemon
			  ○ tangerine/racquet ball
			  ○ tennis ball/baseball
			• Size of a Newborn's Stomach handout
			• PowerPoint

Trainer's Notes	**Newborn's stomach size** An infant's tiny stomach cannot hold large amounts of breast milk. General ranges for full-term infant stomach size from birth to one month of age are: • Day 1: Size of a cherry (5-10 ml) • Day 3: Size of a walnut (22-27 ml) • Day 7: Size of an apricot (45-60 ml) • One month: Size of a large egg (80-150 ml)		

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<table>
<tr><th>Learning Activity</th><th>Description</th><th>Time</th><th>Materials Needed</th></tr>
<tr><td></td><td>Signs that an infant is getting enough to eat
Facilitate a group discussion on signs that an infant is getting enough to eat and signs of dehydration.
Share the Smile Train Feeding Recommendations handout with participants.</td><td>20 minutes</td><td>Smile Train Feeding Recommendations handout
PowerPoint</td></tr>
<tr><td>Trainer's Notes</td><td colspan="3">Sign that an infant is getting enough to eat
Poopy diapers:
Several bowel movements per day— "poop you can scoop"
Yellow stools by day 4
Wet diapers:
5-7 wet diapers per day by day 5 until about 6 months of age
Dark yellow or strong-smelling urine may be sign of dehydration
Weight gain:
Gaining ½-1 oz. per day
Mood and appearance:
Calm/active when awake and satisfied after a feeding (not lethargic)
Signs of dehydration
Infant has not urinated for over 6 hours
No tears when infant cries
Mouth feels dry and sticky
"Soft spot" on top of head is flat or sunken
Infant is acting confused</td></tr>
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General guidelines for amounts and frequency of feedings *(range depending on if infant is breastfeeding or receiving cow's milk and whether or not the infant is malnourished)*

It is best to feed infants based on their hunger and satiety cues. Below are general recommendations for amounts and frequency of feedings.

Week 1:

- Day 1: 2-10 ml per feeding, 8-12 feedings/day
- Day 2: 5-15 ml per feeding, 8-12 feedings/day
- Day 3: 15-30 ml per feeding, 8-12 feedings/day
- Day 4-7: 30-45 ml per feeding, 8-12 feedings/day

Month 1:

- Week 1-2: 45-60 ml per feeding, 8-12 feedings/day
- Week 2-4: 60-90 ml per feeding, 8-12 feedings/day

Months 2-12:

- Month 2-3: 90-150 ml per feeding, 8 feedings/day
- Month 3-6: 120-150 ml per feeding, 6-8 feedings/day
- Month 6-12: 150-180 ml per feeding, 6 feedings/day

Tips for remembering how much to give

- After about 2 weeks, give about 30 ml per feeding per hour (e.g., 60 ml every 2 hours or 90 ml every 3 hours.)
- After first month, go up about 30 ml feeding per month
    - maximum 240 ml per feeding
    - maximum 960 ml per day

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	Description	Time	Materials Needed
Learning Activity	**Foremilk versus hindmilk** • Pour whole milk in one glass container *(this represents hindmilk)*. • Mix whole milk and water in the second glass container *(this represents foremilk)*. • Ask participants to describe the differences they see between the two containers. • Facilitate a discussion about the differences of fat and calorie content of foremilk versus hindmilk by comparing the content and color of two containers.	10 minutes	• A small bottle of whole milk • Water • Two transparent, glass containers
Trainer's Notes	**Foremilk versus hindmilk** • Foremilk is the milk at the beginning of the feeding. It has lower fat and higher lactose. It "quenches the thirst." • Hindmilk is the milk at the end of the feeding. It has higher fat content than foremilk. It "satisfies the hunger." • As the feeding progresses and breast empties, the milk gradually increases in fat while milk volume and flow decrease. • *Teaching example*: breasts do not "flip a switch" at some arbitrary point and start producing hindmilk instead of foremilk. Instead, think of the beginning of a nursing session as being like turning on a hot water faucet. The first water you get out of the tap is not usually hot, but cold. As the water runs, it gradually gets warmer and warmer and warmer. This is what happens with the fat content in breast milk—breast milk gradually increases in fat content until the end of the feeding. • Infants nurse eagerly to get the thirst-quenching foremilk, then slow down and linger over the high-fat milk at the end of their meal. Infants who nurse again soon after the end of the last feeding get more high-fat milk. So, infants who breastfeed more frequently during a growth spurt get more calories! Longer intervals between feedings bring down the fat content of the milk stored in the breast. This nutritional fact about human milk is one of the many reasons why the rigid 3 to 4 hour scheduled style of feeding is biologically incorrect. An infant needs to breastfeed long enough at each breastfeeding to get to the calorie-dense hindmilk. Alternatively, a mother can "top off" an infant with expressed hindmilk and give via spoon or cup.		

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	Description	Time	Materials Needed
Learning Activity	**Tandem Breastfeeding** • Present information on how to increase volume while tandem breastfeeding.	10 minutes	• PowerPoint
Trainer's Notes	**Breastfeeding while pregnant** • Completely safe to breastfeed while pregnant • Milk supply decreases around 4-5th month of pregnancy • Composition and flavor may change **Breastfeeding toddler and infant** • Toddler can increase milk supply for cleft infant and minimize engorgement • No special breast hygiene measures while tandem breastfeed • Newborn gets first priority the first few weeks, then can double nurse; or infant nurses first, then toddler **Transmitting illness while tandem breastfeeding** • If the older sibling has a minor illness, both children (and the whole family) will have been exposed to the bacteria or virus causing the illness, by the time the visible symptoms appear. • In the case of a serious or highly contagious illness, it may be worth "assigning" one child to each breast.		
Evidence of Learning	• Participants will be able to explain the key components of a proper latch. • Participants will be able to describe signs that an infant is getting enough to eat. • Participants will be able to list 2 ways to increases volume and/or calories while breastfeeding.		

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Topic	Cue-Based Feeding		
Learning Objectives	Participants will be able to identify infant feeding cues, signs of hunger and readiness to eat.		
Learning Activity	Description	Time	Materials Needed
	Feeding cue matching game ● Introduce the goals and focus of cue-based feeding. ● Give each participants a blank feeding and satiety cue card and a set of 12 infant pictures. ● Instruct participants to interpret the infant's cues and place the infant picture in the correct category on the feeding and satiety cue cards. ● Review answers. ● Summarize the importance of observing early signs of hunger and signs of satiety, especially among infants with cleft lip/palate.	20 minutes	● Feeding and Satiety Cue handout ● 12-15 sets of laminated individual infant pictures "cut out" from cue cards ● 12-15 laminated cue cards with only categories listed (no infant pictures or picture descriptions)
Trainer's Notes	**Feeding goals:** ● To provide a safe feeding environment for infants ● Maximize intake and minimize stress **Focus on** ● Feeding readiness ● Stress cues		

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	• Quality of "nippling"
	• Caregiver techniques
	
	Feeding cues and satiety guide
	Early feeding cues
	• "I'm hungry—feed me"
	  ○ Stirring
	  ○ Mouth opening
	  ○ Turning head
	  ○ Seeking/rooting
	Middle cues
	• "I'm really hungry—feed me NOW"
	  ○ Stretching
	  ○ Increasing movement
	  ○ Hand to mouth
	Late cues
	• "Calm me, then feed me"
	  ○ Crying
	  ○ Lots of movement
	  ○ Color turning red
	Post-feeding cues
	• "I'm done"
	  ○ Opening fist
	  ○ Arms lying low across body
	  ○ Falling asleep with body relaxed

Evidence of Learning	• Participants will be able to describe 3 early signs of hunger. • Participants will be able to list at least 1 sign of satiety.

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Topic	Infant Dental Health		
Learning Objectives	Participants will understand who is at risk, the causes, and ways to prevent early childhood caries.		
Learning Activity	Description	Time	Materials Needed
	Group discussion on dental health • Facilitate a discussion on early dental health using PowerPoint slides.	20 minutes	• PowerPoint
Trainer's Notes	**Why are healthy infant teeth and early dental health important?** • Accustom infant with cleft lip/palate to have adults touch inside of mouth • Allow children to chew and eat properly • Help your child to speak more clearly • Guide adult teeth into place • Help to shape infant's face • Prevent early childhood caries • Keep future dental costs to a minimum **Early Childhood Caries** is defined as the presence of one or more decayed, missing (due to caries) or filled tooth surfaces in any primary tooth. **What causes dental caries?**		

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- Caries is a multi-step process that results in destruction of the tooth structure.
- Oral bacteria turn the sugars from food into acid, which removes minerals from the tooth enamel.
- When sugars are consumed infrequently, saliva is able to protect teeth from the acid and minerals are deposited back into the enamel.
- When sugars are consumed frequently, there is insufficient time for the minerals to be deposited back. The tooth enamel becomes weakened and causes a cavity.

Role of bacteria in dental caries

- Dental decay is an infection and can be transmitted from mother to child.
- Bacteria that causes dental decay are transmitted from the primary caregiver, typically the mother, via saliva contact. The higher the bacteria level in the caregiver's mouth, the more likely the child will get the infection.
- Caregivers with high bacteria levels usually have:
    - a high frequency of sugar intake
    - poor oral hygiene
    - high levels of dental caries

Potential consequences of Early Childhood Caries

- Pain
- Impaired chewing and nutrition
- Infection
- Increased caries in permanent dentition
- Students with dental pain are almost four times more likely to have a low-grade point average
- Difficulty sleeping
- Poor self-esteem
- Extensive and expensive dental work which often must be completed under general anesthesia

Who is at risk of Early Childhood Caries?

- Babies who go to bed with bottle
- Babies who have the bottle propped in their mouth
- Babies who take anything besides plain milk in a bottle (sugar water, juice, flavored milk, soda)

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	• Babies who breastfeed "at will" • Babies with decreased saliva production • Babies who come into contact with mother's saliva **Ways to protect an infant's teeth** • Avoid testing the temperature of the bottle with your mouth • Do no clean a pacifier or a bottle nipple by putting it in your mouth • Avoid sharing utensils (e.g. spoons) • Only offer breastmilk or milk in bottle • Wipe gums and clean teeth with clean towel after feedings (if able) • Cut back on saliva transferring behavior from parents/siblings • Start infant dental care ideally at birth, and no later than when the first tooth erupts **How should infants' teeth be cleaned?** • Use a clean, wet washcloth or infant finger toothbrush • Gently massage teeth and gums
Evidence of Learning	• Participants will be able to clearly state 2 causes of Early Childhood Caries. • Participants will be able to describe how to protect infants' teeth from Early Childhood Caries.

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Topic	Breast Milk Sharing: Risks, Benefits, and Practical Guidance		
Learning Objectives	Participants will be able to better counsel mothers on human milk sharing.		
Learning Activity	Description	Time	Materials Needed
	Group discussion on breast milk sharing ● Ask participants the following questions and recording answers on the flip chart: ○ What are the local practices and prevalence of breast milk sharing or "wet nursing"? ○ How common is it in your country to breastfeed or give a bottle of shared breast milk to another mother's infant? ○ What are the perceived risks (transferable viruses) of breast milk sharing? ○ What are the benefits of sharing breast milk (including human milk vs. cow or animal milk)? ○ When should breast milk sharing not be recommended? ● Synthesize and add additional information about the risks and benefits of breast milk sharing. ● Explain the screening guidelines for infection risk for mothers.	10 minutes	● Flip chart labeled with "Risks", "Benefits", and "Screening Guidelines" ● Markers

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Trainer's Notes	**Risks and benefits of breast milk sharing** Perceived risks and benefits of feeding milk from another mother may not align with actual risks and benefits. However, milk sharing and donation are perceived differently in different cultures around the world; what one country and culture sees as potentially risky may be a long-standing and widely accepted tradition in another country and culture. We are not here to make any judgment about these practices. Instead, we simply hope to offer information that will allow you to make an informed decision that is right each mother, infant, and culture. **Screening guidelines for breast milk sharing** ● Recommend breast milk sharing only if donor mother ○ is in good health ○ is on medications or herbal supplements compatible with breastfeeding ○ has a clear infectious disease history (HIV, Hepatitis B, HTLV-1) ● Breast milk sharing is *not recommended* when donor mother ○ uses illegal drugs or marijuana ○ smokes tobacco ○ consumes alcohol (more than one drink per day) ○ is at risk for HIV or has a sexual partner in past year who is at risk for HIV		
Learning Activity	Description	Time	Materials Needed
	Home pasteurization Describe the process for home pasteurization.	10 minutes	● PowerPoint

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Trainer's Notes	**Home breast milk pasteurization steps** 1. Place milk (60-150 ml) in a heat resistant glass jar with a lid. 2. Place jar of milk in small pan of water. Water should be two fingers above milk. 3. Heat water on a very hot fire until it reaches a rolling boil (large bubbles). 4. Immediately remove jar of milk from boiling water. Leaving the water to boil too long will damage some nutrients in the milk. 5. Place jar in cold water or let jar stand until reaches room temperature. 6. Feed this milk at room temperature within 4-6 hours or refrigerate or freeze the milk.
Evidence of Learning	• Participants will be able to list 4 social practices that would prohibit breast milk sharing. • Participants will be able to explain the process for home pasteurization.

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LESSON 2: Breast Milk Expression and Storage

TARGET AUDIENCE: Hospital Health Staff and Community Health Workers

LEARNING GOALS:

- Participants will be able to explain the importance of early breast milk expression.
- Participants will be able to counsel mothers on using various methods to express breast milk.
- Participants will understand the importance of proper storage of breast milk.

TOPICS:

1. How to Effectively Express Breast Milk
2. Proper Storage of Expressed Breast Milk

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Topic	How to Effectively Express Breast Milk		
Learning Objectives	• Participants will be able to explain the importance of early breast milk expression. • Participants will be able to demonstrate how to effectively express breast milk using hand expression and manual pumping *(if available locally)*.		
Learning Activity	Description	Time	Materials Needed
	Advantages of hand expression of breast milk • Facilitate a discussion with participants around the advantages of hand expression of breast milk versus using a manual or electric pump.	15 minutes	• PowerPoint • Flipchart • Markers
Trainer's Notes	**Advantages of hand expression of breast milk** • Less expensive • Less work • No need to sterilize pump equipment • Convenient – can be done anywhere • Does not require electricity • Does not cause discomfort • Can relieve engorgement • Can relieve a blocked duct • Skin to skin is more stimulating • Will increase milk supply for the future • It is the best way to express colostrum		

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	Description	Time	Materials Needed
Learning Activity	**Group discussion on importance of colostrum** • Facilitate a discussion with the group on the importance of colostrum and the difference between colostrum and mature milk.	10 minutes	• PowerPoint
Trainer's Notes	**What is colostrum?** • Colostrum gives infants immunity to the germs that are in the surrounding environment. • Colostrum is protective, coating the intestines to block these germs out so they cannot be absorbed into an infant's system. This barrier seals the infant's insides, preparing for a healthy life. • Colostrum contains antibodies against small pox, polio, measles and influenza. • Colostrum inhibits growth of *E. coli* and provides protection from inflammation. • Colostrum is a laxative and therefore, it helps clear out meconium. Early clearing of meconium helps to reduce jaundice. • Colostrum helps prevent low blood sugar in healthy full-term infants. **Differences between colostrum and mature milk** • Colostrum is the first milk that is produced after birth until day 4. During the first 24 hours of birth, the breasts will produce only about 30-40 ml of colostrum (only a few teaspoons for the entire day). • Colostrum is very high in protein and calories. • Transitional milk (days 4-10) is lower in protein and calories, but higher in fat and sugars. • Mature milk (after day 10) is the lowest in protein and calories, and highest in fat and sugar. **How do foremilk and hindmilk compare to colostrum?** • Foremilk is watery, lower in fat and high in lactose sugar, protein, vitamins and minerals – it quenches an infant's thirst. • Hindmilk is higher in fat and calories – it satisfies an infant's hunger.		

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	Description	Time	Materials Needed
Learning Activity	**Breast milk hand expression video** ● Show video on how to hand express milk. ● Discuss video with participants.	15 minutes	● PowerPoint slide with link to video ● Speakers
Trainer's Notes	Video showing techniques for hand expressing breast milk from Global Health Media can be found at this link: https://globalhealthmedia.org/portfolio-items/how-to-express-breastmilk/?portfolioID=5623		
	Description	Time	Materials Needed
Learning Activity	**Breast milk hand expression demonstration and practice** ● Explain the steps of hand expression with participants. ● Ask participants to practice hand expression technique using plush/pillow breast (or own if appropriate) by giving the following instructions: ○ *Massage*: Using three middle fingers massage breast using small circles around outside of areola or tapping with fingertips. ○ *Press*: Place two small circular Band-Aids on outside of areola across from each other. Place index and thumb fingers on Band-Aids. Press fingers towards chest. ○ *Compress*: Squeeze fingers towards areola together to express milk. ○ *Release* and *repeat*. ● Summarize and debrief with participants.	20 minutes	● Small circular Band-Aids (1.5-2.5cm) ● Soft, plush breasts

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Trainer's Notes	**Getting ready to express breast milk** 1. Wash hands. 2. Get a clean container for collecting milk. Colostrum can be expressed into a small teaspon, and mature milk can be expressed into a bottle or cup. 3. Relax and get comfortable. Milk will flow more easily if you are warm and comfortable. 4. Privacy can help. Try the breathing exercises learned for labor, or visualize milk flowing. 5. It can be easier to get the milk flowing if the infant is nearby, or an article of clothing that smells like the infant. 6. Gently massage breasts with hands and fingertips to stimulate milk ejection reflex. This is key to effective expressing. 7. Bending forward with breasts suspended can help milk flow due to gravity. **Steps to express breast milk** 1. HOLD breast with fingers and thumbs cupped around the breast in a C shape, near but not touching the areaola. 2. PRESS fingers and thumb back towards the chest. 3. COMPRESS the breast between fingers and thumb, moving them slightly towards the nipple without lifting them from the breast. 4. RELEASE without moving hand from the breast. 5. REPEAT, moving hand to a different place around the breast after every few compressions or whenever milk flow stops, compressing all of the milk ducts. Releasing and repreating rhythmically helps to mimic the action of an infant breastfeeding. **Tips for expression of breast milk** • For most moms, it is a process of trial and error. Experiment what works best to achieve a spray, not drops or dribbles. • Allow time at first. Expression should take 20-30 minutes. Frequent short sessions are usually more effective than infrequent, longer expressing sessions. • Switching between breasts several times as milk flows can help trigger the milk ejection reflex. The more milk ejection reflex stimulated, the more milk is produced. • Hand expression should feel comfortable. If it is not, adjust until it feels okay.

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	Description	Time	Materials Needed
Learning Activity	*This activity should only be included if hand breast pumps are available locally.* **Manual breast milk hand pump demonstration and practice** • Show video on how to use a hand breast milk pump. • Demonstrate proper technique for using a hand pump. • Allow participants to practice using a hand pump. • Summarize and debrief with participants.	10 minutes	• Soft, plush breasts • Manual pump • PowerPoint with weblink (if showing video) • Speakers
Trainer's Notes	The following video can be shown to demonstrate proper technique for manual pumping: https://med.stanford.edu/newborns/professional-education/breastfeeding/maximizing-milk-production.html		
Evidence of Learning	Participants will be able to demonstrate proper hand positioning and technique while hand expressing breast milk.		

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<table>
<tr><th>Topic</th><th colspan="3">Proper Storage of Breast Milk</th></tr>
<tr><td>Learning Objectives</td><td colspan="3">Participants will understand guidelines for breast milk storage with and without refrigeration to decrease bacterial growth.</td></tr>
<tr><td rowspan="2">Learning Activity</td><td>Description</td><td>Time</td><td>Materials Needed</td></tr>
<tr><td>Group discussion and presentation on Breast Milk Storage Guidelines
● Distribute the Breast Milk Storage Guidelines handout to participants.
● Reviews Breast Milk Storage Guidelines with participants.
● Presents additional information about storing breast milk.</td><td>20 minutes</td><td>● Breast Milk Storage Guidelines handout
● PowerPoint slides</td></tr>
<tr><td>Trainer’s Notes</td><td colspan="3">Guidelines for breast milk storage with and without refrigeration
Proper breast milk storage is important to decrease bacteria growth. The proper breast milk storage procedure is:
● Wash hands well before expressing milk.
● Always use clean and sterilized containers to collect and store milk.
● Freshly pumped breast milk can be left at room temperature for up to 4 hours, refrigerated for 4 months, and frozen for 6 months.
● Freshly expressed milk should not be added to already cooled milk to prevent rewarming of already stored milk. Cool down milk before adding it to older stored milk.
● Most infants will drink milk cool, at room temperature, or warm; infants may demonstrate a preference.
● Milk is best warmed by placing the smaller container holding milk in a larger container of lukewarm water.
● Once the infant has taken breast milk from a cup or bottle, the rest of the milk needs to be used within 1 hour. Either try to give the milk to the infant an hour later, give the breast milk to an older sibling, or dispose</td></tr>
</table>

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	of it. Do not save the milk later than an hour since bacteria will start to grow once it touches the infant's saliva. **Procedure for cleaning feeding items** 1. Wash hands well. 2. Take apart all bottle parts, teats, rings, caps, spoons, cups, etc. 3. Rinse all items by holding them under running water (warm or cold water). 4. Wash the feeding items: a. Place items in a clean basin or container only used for feeding items. b. Fill water basin with clean hot water and soap. c. Scrub items with a brush only used for feeding items. d. If using teats, squeeze water through the hole in the teat. 5. Rinse again with clean water in a separate basin that is only used for cleaning infant feeding items. 6. Place all feeding items, water basin(s) and brush on a clean towel away from dust and dirt. Allow to air dry completely. Do not use a dish towel to rub or pat dry the feeding items because doing so may transfer germs. 7. Clean the water basin and brush by rinsing and allowing to air dry after each use. a. Wash the water basin and brush with warm, soapy water every few days. b. If an infant has a weakened immune system (i.e. HIV), wash the water basin and brush after every use. 8. For extra protection, all feeding items can be sanitized by following these steps: a. Place the disassembled feeding items into a pot and cover with water. b. Put the pot over heat and bring to a boil. c. Boil for 5 minutes. d. Remove items with clean tongs. e. Allow to air dry.
Evidence of Learning	Participants will be able to describe the process for properly storing breast milk.

LESSON 3: Breast Milk Alternatives

TARGET AUDIENCE: Hospital Health Staff and Community Health Workers

LEARNING GOALS:

- Participants will gain knowledge of the nutritional differences between breast milk, cow's milk, and commercial infant formula.
- Participants will learn the importance of pasteurizing cow's milk to make it safer to drink.
- Participants will learn the difference between lactose intolerance and cow's milk protein allergy.

TOPICS:

1. Nutritional Differences Between Breast Milk, Cow's Milk, and Infant Formula
2. Risks of raw Cow's Milk and Safe Preparation
3. Lactose Intolerance, Cow's Milk Protein Allergy, and Cow's Milk Intolerance
4. Considerations for Choosing a Breast Milk Alternative

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Topic	Nutritional Differences Between Breast Milk, Cow's Milk, and Infant Formula		
Learning Objectives	Participants will be able understand that cow's milk formula is incomplete and supplementation is needed.		
Learning Activity	Description	Time	Materials Needed
	Venn diagram activity • Tape two flip chart papers together. • Draw a Venn diagram (3 overlapping circles) and label the circles with "Breast Milk", "Commercial Infant Formula", and "Cow's Milk". • Label sticky notes with the following: 1. *Anti-parasites* 2. *Anti-viruses* 3. *Anti-allergies* 4. *Anti-bacteria* 5. *Antibodies* 6. *Growth substances* 7. *Digestive substances* 8. *Appetite stimulant* 9. *Hormones* 10. *Probiotics* 11. *Colostrum* 12. *Water* 13. *Vitamin D* 14. *Vitamin A* 15. *Vitamin C* 16. *Vitamin K* 17. *Minerals* 18. *Fat* 19. *Cholesterol* 20. *Fats for brain development* 21. *Carbohydrates* 22. *Lactose* 23. *Easy-to-digest proteins* 24. *Hard-to-digest proteins* • Give each participant 2 labeled sticky notes.	30 minutes	• Two pages of a flip chart • Tape • Marker • 24 sticky notes

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	• Ask participants to place their sticky notes on the Venn diagram in the labeled circle where they belong. They can be placed where the circles overlap. • Go over participants' answers and provide feeding as needed.		

Trainer's Notes

Differences in content of breast milk, infant formula, and whole cow's milk

"Formula is not an acceptable substitute for breast milk because formula, at its best, only replaces most of the nutritional components of breast milk: it is just a food, whereas breast milk is a complex living nutritional fluid containing antibodies, enzymes, long chain fatty acids and hormones, many of which simply cannot be included in formula. Furthermore, in the first few months, it is hard for the infant's gut to absorb anything other than breast milk. Even one feeding of formula or other foods can cause injuries to the gut, taking weeks for the infant to recover." UNICEF, 2005

	Breast milk	Infant formula	Whole cow's milk	Why it is important
Anti-parasites	x			Prevent parasites
Anti-viruses	x			Prevent viruses
Anti-allergies	x			Decrease risk of allergies
Anti-bacteria	x			Protect against harmful bacteria
Antibodies	x			Help destroy substances that carry disease
Growth substances	x			Help infant grow
Digestive substances	x			Help body breakdown and digest milk
Appetite stimulants	x			Stimulate/regulate appetite
Hormones	x			Important for brain development

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Colostrum	x			Rich in protein and antibodies; provide immunity; helps digestive system develop
Probiotics	x	x		600 types of good bacteria in breast milk; protect the gut from various diseases; some in formula
Vitamin A	x	x		Important for vision, bone growth, hair, nails and skin
Vitamin C	x	x		Important for healthy skin, blood and strong immunity
Vitamin D		x		Important for bone growth
Vitamin K		x		Prevents bleeding
Minerals	x	x	x	Building blocks for brains, bones, and healthy body
Water	x	x	x	Infant's' body is made up of 75% water (adult woman 55%)
Fat	x	x	x	Building blocks for growth and development
Cholesterol	x		x	Important for brain development
Fats for brain development	x	x		Important for brain development
Carbohydrates	x	x	x	Provide energy
Lactose	x	x	x	Important for brain development (68% in breast milk vs 48% in cow's milk)
Easy-to-digest proteins	x	x		Whey: Casein 60:40; softer curd, easier to digest
Hard-to-digest proteins			x	Whey: Casein 20:80; harder curd, difficult to digest

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Just because some of the primary ingredients in infant formula, breast milk, and cow's milk have the same names, they are not absorbed the same way. For example, 49% of the iron in breast is absorbed, compared to 7% in infant formula and 10% in cow's milk.

Cow's milk versus human milk

Cow's milk is nutritionally different than human milk:

Protein

- Protein in cow's milk is two times higher than protein in breast milk and is more difficult to digest. This leads to constipation and digestive distress.
- Protein in cow's milk can irritate the lining of an infant's stomach and intestines, leading to blood loss in stools and anemia.

Fat

- Cow's milk is higher in saturated fat versus unsaturated fat, making the fat content not ideal for brain development.

Minerals

- The high mineral (calcium, phosphorus, potassium, sodium, magnesium) and protein content in cow's milk can stress an infant's immature kidneys. More water is drawn from body and excreted by the kidneys causing dehydration.
- Cow's milk has very little iron and is difficult for the infant to absorb, leading to anemia.
- Cow's milk is low in zinc, which has important functions in growth, immunity, and prevention of diarrhea.

Vitamins

- Cow's milk is low in vitamin A, which is important for vision, bone growth, hair, nails and skin.
- Cow's milk is low in vitamin C, which is important for healthy blood and immune system.
- Cow's milk is low in vitamin D, which helps absorb calcium. Low vitamin D can cause rickets (weak bones).

Digestion

- Infants digest human milk more quickly than cow's milk (or infant formula):

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	○ Human milk proteins are easily digested compared to cow's milk. The protein in cow's milk is harder to digest and stays in stomach longer causing infants to feel full. That is why breastfed infants get hungry sooner than infants who are fed cow's milk (or commercial formula). ○ The fat in human milk comes with a substance (an enzyme) called lipase. This substance breaks the fat down into smaller globules that can be better absorbed by the body and used for energy more quickly. ○ It does not take as much energy to digest human milk as it does to digest cow's milk or formula. **Why is it important to follow exact recipe for fresh cow's milk formula?** • If not diluted properly, cow's milk can put strain on kidneys, cause dehydration, seizures and even death. • While diluting cow's milk with water puts less strain on the kidneys, the nutrients also get diluted. This can cause many vitamin and mineral deficiencies which cannot be made up unless these nutrients are added back to cow's milk. Supplementary food will help fill the nutritional gaps of cow's milk once old enough to eat solids.
Evidence of Learning	• Participants will be able to name 3 components of breast milk that are not in cow's milk or commercial formula. • Participants will be able to describe reasons for proper preparation of home-made cow's milk formula.

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<table>
<tr><th>Topic</th><th colspan="3">Risks of Raw Cow's Milk and Safe Preparation</th></tr>
<tr><td>Learning Objectives</td><td colspan="3">Participants will understand the significant risks of raw cow's milk and how to pasteurize milk.</td></tr>
<tr><td rowspan="2">Learning Activities</td><td>Description</td><td>Time</td><td>Materials Needed</td></tr>
<tr><td>Group discussion
Facilitate a group discussion by asking the following questions:
Do families use raw or boiled milk when making home-made cow's milk infant formula?
What could be some risks of giving raw milk to infants?
How can you decrease risk of pathogens?
What are the steps in preparing and pasteurizing cow's milk?</td><td>30 minutes</td><td>Markers
Flip chart, labeled:
Raw vs. Boiled Milk
Risks of Raw Milk
Ways to Decrease Risk of Pathogens
How to Pasteurize Cow's Milk
WHO infant feeding counselor flyer</td></tr>
<tr><td>Trainer's Notes</td><td colspan="3">Bacteria risks of raw milk
Raw milk causes pathogenic bacteria to grow fast at a warm temperature. Bacteria in fresh milk doubles every 20 minutes!

Giving raw milk to infants may increase the risk for developing several infections associated with fever, diarrhea, and other gastrointestinal signs and symptoms. These can lead to serious consequences including malnutrition, dehydration, chronic disease, and even death. The following are common infections and associated signs and symptoms:
E. coli (bloody diarrhea, fever kidney failure, hemolytic uremic syndrome, and possibly death)</td></tr>
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- *Salmonella* (diarrhea, fever, abdominal cramps)
- *Listeria* (diarrhea, fever)
- *Brucellosis* (fever, sweating, joint and muscle pain, and may cause chronic disease)
- *Cryptosporidium* (watery diarrhea, stomach cramps, vomiting, fever, weight loss)
- *Campylobacter* (vomiting, bloody diarrhea, fever, and abdominal cramps)
- *Staphylococcus aureus* (vomiting, diarrhea, dehydration, and low blood pressure)

How to safely prepare cow's milk infant formula

Refer to the WHO Infant feeding counseling flyer:
http://www.who.int/hac/crises/international/middle_east/Lebanon_guidelines_for_breast_milk_substitutes.pdf

1. Wash hands with warm soapy water before preparing infant milk.
2. Always used marked cup or glass to measure water and milk.
3. Fill the cup or glass to the "water" mark with water. Put the water into the pot.
4. Fill the cup or glass to the "milk" mark with milk. Add the milk to water in the pot.
5. Measure the sugar by filling the spoon (level, rounded, or heaped as directed) and add spoonfuls to the liquid. Stir well.
6. Bring liquid to a boil and then let it cool. Keep it covered while it cools.
7. Feed infant by a cup. Discard any unused formula, give it to an older child or mother can drink it.
8. Wash all the cups, spoons, bottles, teats/nipples, rings, caps in warm soapy water.

Benefits of pasteurization (boiling milk)

- Pasteurization is a process that kills harmful bacteria by heating milk to a specific temperature for a set period of time.
- Pasteurization kills the bacteria responsible for diseases such as listeriosis, salmonellosis, campylobacteriosis, typhoid fever, tuberculosis, diphtheria, and brucellosis, as well as other bacteria; also destroys HIV if expressed breast milk.
- Pasteurized milk still contains low levels of the type of nonpathogenic bacteria that can cause food to spoil, so it is important to use the milk within a few hours or keep refrigerated.

How to pasteurize raw cow's milk via flash-heating method

1. Put 50-150ml of milk in a clean heat-resistant container or glass jar.
2. Place jar of milk in a small pan of water.

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	3. Make sure water is two fingers above the level of milk in the jar. 4. Heat water on hot fire until water reaches a rolling boil (large bubbles). 5. Leaving the water to boil too long will damage nutrients in the milk. 6. Remove jar immediately from boiling water. 7. Place jar in cool water or let it stand alone until reaches room temperature. 8. Protect milk as it cools by placing small plate on it. 9. This heated milk can be safely given at room temperature within 6 hours, or milk can be refrigerated to use within the next few days.
Evidence of Learning	Participants will be able to list two types of bacteria or diseases that pasteurizing milk will destroy.

Topic	Lactose Intolerance, Cow's Milk Protein Allergy, and Cow's Milk Intolerance		
Learning Objectives	Participants will understand the development of lactose intolerance and its rare occurrence in infants.		
Learning Activities	Description	Time	Materials Needed

	Lactose intolerance demonstration
	• Place three clear glass containers on a table
	  ○ Pour 100-150 ml of dark oil in container 1.
	  ○ Pour 100-150 ml of orange juice in container 2.
	  ○ Pour 180-210 ml of milk in container 3.
	• Ask one participant to pour half of the milk from container 3 into container 1.
	• Ask another participant to pour the rest of the milk from container 3 into container 2.
	• Discuss with participants what the activity represents.
		15 minutes	• 3 glass containers
			• 100-150 ml of dark oil (palm oil)
			• 100-150 ml of orange or pineapple juice
			• 180-210 ml of milk
			• Paper towel

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Trainer's Notes	Container 1 represents lactose intolerance (no lactase present). The milk is not mixed/absorbed in the body, so it moves through the body undigested and causes lots of gastrointestinal upset. It has no long-term consequences. Container 2 represents milk protein allergy. The lactase is present so the milk is mixed/absorbed, but the body's immune system does not recognize the milk proteins and attacks the protein. **Lactose intolerance** • Lactose is a sugar (carbohydrate) found in breast milk and cow's milk. • Human breast milk has the highest amount of lactose than any other mammal (and have the largest brains at birth). • Lactose must be broken down to smaller units by a substance (an enzyme) called lactase, found in the small intestine, to make energy for the body. • Lactose intolerance occurs when the body produces little or no lactase. • Without lactase, lactose is fermented by bacteria in the large intestine. • *Prevalence*: It develops with age; lactase naturally declines after weaning. It is extremely uncommon with infants - incompatible with life. • *Symptoms:* abdominal pain, distention and cramping, gas and diarrhea. Symptoms start immediately after consuming high lactose dairy products. Usually symptoms are life-long once diagnosed. • *Treatment*: need to eliminate or limit dairy in diet.

Learning Activities	Description	Time	Materials Needed
	Cow's milk protein allergy demonstration • Ask one participant to add beet juice, cranberry juice, red food dye or equivalent to container 2. • Discuss with participants what the activity represents.	15 minutes	• Red food dye, beet juice, tomato juice

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Trainer's Notes	This activity represents cow's milk protein allergy. The immune system reacts to the proteins causing injury (bleeding) to the stomach and intestines. This results in blood in the stool. Other causes of blood in stool: bacterial infection, anal tears, problems with digestive tract, nipple injury, lactose overload, vitamins, certain foods that appear to be blood (i.e. beets). **Cow's milk protein allergy** • Cow's milk protein allergy is caused by an immune reaction to proteins found in milk. The immune system, which normally fights infections, overreacts to proteins in cow's milk. Every time the child has milk, the body thinks these proteins are harmful invaders and works very hard to fight them. This causes an allergic reaction. • *Prevalence*: common in infants (2-5%); 50% resolves by 1 year old and 75% by 3 years old; completely resolved by 5 years old. • *Symptoms*: fussiness, irritability, wheezing, hives, abdominal pain, vomiting, refusal to eat, loose and bloody stool. • *Treatment*: strict no dairy diet for infants; if breastfeeding, mothers should follow no dairy diet.		
Learning Activities	Description	Time	Materials Needed

	Cow's milk intolerance demonstration
	• Ask two participants to come to the front of the room and help with the demonstration.
	  ○ Participant 1 holds cup on table with one hand and straw into cup with the other hand.
	  ○ Participant 2 spoons liquid into straw.
	  ○ Participant 2 spoons cottage cheese into straw.
	• Discuss with participants what the activity represents.
		15 minutes	• Dixie cup
			• Cottage cheese or equivalent
			• Water or other liquid
			• Spoon
			• Large straw or tube diameter of a highlighter

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Trainer's Notes	The liquid represents whey (quickly passes through the straw). Curds represent casein (slowly moves through the straw).
	
	Cow's milk intolerance
	• Cow's milk is much more difficult to digest because of the different protein types it contains:
	  ○ Breast milk is 40% casein and 60% whey
	  ○ Cow's milk is 80% casein and 20% whey
	• Whey protein is a liquid and empties from the stomach faster.
	• Casein proteins curdle, difficult to digest and stays in the stomach longer.
	• *Prevalence*: very common in infants and adults
	• *Symptoms*: irritable bowel syndrome, abdominal distension, lethargy, eczema. Can take up to 3 or more days for symptoms to appear.
	• *Treatment*: Limit dairy exposure.

Evidence of Learning	• Participants will be able to list an age when lactose intolerance symptoms may start to show up. • Participants will be able to tell the difference between lactose intolerance and milk allergy.

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Topic	Considerations for Choosing a Breast Milk Alternative		
Learning Objectives	Participants will understand important considerations for choosing an alternative to breast milk.		
Learning Activities	Description	Time	Materials Needed

	Choosing a breast milk alternative
	• Divide participants into 5 small groups (3-4 participants each).
	• Give each group a set of 5 index cards labelers with the following types of milk:
	  ○ Breastfeeding (infant feeding directly from the breast)
	  ○ Expressed breast milk
	  ○ Commercial infant formula
	  ○ Pasteurized cow's milk with added oil, sugar, water, AND a multivitamin/mineral mix
	  ○ Pasteurized cow's milk with added oil, sugar, and water
	• Instruct groups to order the types of milk from the best source of nutrition for infants to the least.
	• On the back of each index card, ask groups to list at least 3 factors that need to be in place to make it possible for mothers to provide this type of milk to their infants safely.
	• Ask groups to share their answers and record them on a flip chart.
	• Facilitate a discussion on the best source of nutrition for infants and considerations for moving to the next option.
		20 minutes	• 25 index cards
			• Markers
			• Flip chart
			• PowerPoint

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Trainer's Notes	**Considerations for choosing an alternative to breast milk** The best source of nutrition for an infant is breast milk. It is recommended that mothers, and community health workers who counsel them, try all interventions at their disposal to provide breast milk to the infant, either through breastfeeding or expressed milk. However, if all fails breast milk alternatives are needed. The best source of nutrition for infants is in the order listed below. Several factors that need to be considered for each source of milk is also listed. 1. *Breastfeeding (infant feeding directly from the breast)* o Mother is alive o Mother able to produce breast milk o Considerations for HIV status o Infant is able to latch 2. *Expressed breast milk* o Mother is alive o Mother able to produce breast milk o Considerations for HIV status o Mother received counseling on breast milk expression o Clean cup/spoons to collect milk o Mother received counseling on proper storage of breastmilk 3. *Commercial infant formula* o Access to infant formula in community o Cost of infant formula o Hygienic and sanitary conditions to prepare formula o Availability of clean water to prepare formula o Mother received counseling on how to prepare formula 4. *Pasteurized cow's milk with added oil, sugar, water, AND a multivitamin/mineral mix* o Access to multivitamin/mineral mix o Cost of multivitamin/mineral mix o Hygienic and sanitary conditions to prepare cow's milk recipe o Availability of clean water to prepare cow's milk recipe o Availability of fuel to pasteurize milk o Mother received counseling on how to pasteurize cow's milk o Mother received counseling on how to prepare cow's milk recipe

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	○ Clean cup/spoons to feed infant 5. *Pasteurized cow's milk with added oil, sugar, and water* ○ Hygienic and sanitary conditions to prepare cow's milk recipe ○ Availability of clean water to prepare cow's milk recipe ○ Availability of fuel to pasteurize milk ○ Mother received counseling on how to pasteurize cow's milk ○ Mother received counseling on how to prepare cow's milk recipe ○ Clean cup/spoons to feed infant
Evidence of Learning	Participants will be able to counsel families on the best option for breast milk alternatives considering available resources.

LESSON 4: Introduction of Solids to Children with Cleft Lip/Palate

TARGET AUDIENCE: Hospital Health Staff and Community Health Workers

LEARNING GOALS:

- Participants will identify the signs of developmental readiness to consume solid foods.
- Participants will identify appropriate food textures to match feeding skill and learn to modify food textures.
- Participants will understand that an unrepaired cleft lip or palate does not exclude a child from being offered spoon feedings.
- Participants will identify the benefits of providing spoon feedings to children with unrepaired clefts.

TOPICS:

1. Developmental Readiness for Spoon Feeding
2. Tolerance to Texture and Readiness to Advance
3. Considerations When Feeding Children with an Open Cleft

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<table>
<tr><th>Topic</th><th colspan="3">Developmental Readiness for Spoon Feeding</th></tr>
<tr><td>Learning Objectives</td><td colspan="3">• Participants will be able to determine developmental readiness of children to begin spoon feeding.
• Participants will learn how to modify food textures to match feeding skills.</td></tr>
<tr><td rowspan="2">Learning Activity</td><td>Description</td><td>Time</td><td>Materials Needed</td></tr>
<tr><td>Coordination activity
• Ask participants to stand up.
• Instruct participants to begin by rubbing their stomach.
• Then, while continuing to rub their stomachs, instruct participants to close their eyes, then balance on one leg, and pat their head.
• Ask participants to share their experience and facilitate a discussion on what is required to learn new skills.</td><td>10 minutes</td><td>• PowerPoint</td></tr>
<tr><td>Trainer's Notes</td><td colspan="3">Developmental readiness to begin spoon feeding
• It is hard to learn new skills. It is especially hard to learn new skills when one has to focus on balancing, while learning.
• When a child is learning to eat, they cannot also be learning to balance themselves. They need to be secure in their sitting before we ask them to learn to eat foods.</td></tr>
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<table>
<tr><th></th><th>Description</th><th>Time</th><th>Materials Needed</th></tr>
<tr><td>Learning Activity</td><td>Food textures and readiness
Divide participants into groups of 3-5.
Give each group a Food Textures and Readiness handout.
Instruct groups to list 3 foods from each good group that can be
made smooth or pureed (sitter category)
mashed or ground (crawler category)
offered diced or in soft small pieces (walker category)
Ask each group to share and write answers on flip chart.
Facilitate a discussion on signs of developmental readiness, how to identify the appropriate food textures, and how to modify the textures for each stage.</td><td>20 minutes</td><td>Food Textures and Readiness handouts
Pens
Marker
Flip chart labeled with:
Sitter (puree)
Crawler (mashed)
Walker (diced)
PowerPoint</td></tr>
<tr><td>Trainer’s Notes</td><td colspan="3">Body and mouth movements
Feeding is a learned skill. It is most successful when it is done with a child who is developmentally ready to consume the foods being offered. Solid introduction is based on developmental readiness, not age or diagnosis.

Our abilities to move our mouths match our abilities to move our bodies:
A child who is able to sit up well and control their head is ready to accept tastes of smooth, puree food.
A child who can move their arms and legs back and forth to crawl can also move their tongue from side to side in their mouth. This allows them to move mashed or ground pieces of food to their gums to chew.
A child who can walk along furniture or walk independently can move pieces of food to their gums, chew in a more mature pattern and eat soft pieces of most foods.
Signs of readiness for various textures
Generally, between 4-6 months of age, children begin to show developmental readiness to begin spoon feeding. These signs of readiness include:
Sitting and holding their heads well</td></tr>
</table>

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	○ Bringing toys to the mouth ○ Munching with jaws ● *Sitters* can suckle the spoon and enjoy smooth or pureed foods. ● *Crawlers* can use their tongues to move food to their gums and begin to mash it. They can eat mashed or ground foods. ● *Walkers* can move food to their gums and chew. They can eat foods that can be offered diced or in soft, small pieces.		
Learning Activity	Description	Time	Materials Needed
	Feeding skills by age activity ● Transfer yogurt (or pudding) into cups ● Pass out one spoon, one cup with yogurt, and a couple of crackers to each participant. ● Ask participants to follow your instructions and, as they complete activity, to pay close attention to: ○ where and how the food moves ○ what they do with their lips, tongue, and cheeks ● Ask participants to strip yogurt (or liquid) off of a spoon. ○ Ask participants to describe what they noticed (how the food moves, what they do with their lips, tongue, and cheeks) while eating. ● Ask participants to take a bite of the cracker. ○ Ask participants to describe what they noticed (how the food moves, what they do with their lips, tongue, and cheeks) while eating. ● Facilitate a discussion on how a cleft lip or palate would impact these eating processes.	30 minutes	● Spoons (1 per participant) ● Yogurt or pudding (or liquid food) ● Spoons ● Plastic/paper/Dixie cups (1 per participant) ● Crackers or other dry food ● Napkins ● Hand sanitizer

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Trainer's Notes

Feeding skills by age

- The key oral structures involved in feeding and their overall role include:
  - Tongue – gathers and moves the food
  - Lips – pulls food from spoon and liquid from cup
  - Jaw – chews food
  - Cheeks – keep food over teeth
- Typically, these oral skills progress with age if the child is offered opportunity to practice new ones:

	0-6 months	*6-9 months*	*9-12 months*	*12+ months*
Jaw	Moves up and down	Moves up and down, begins to move in a diagonal pattern	Moves diagonally, begins to move in a circular pattern (rotary chew), stabilizes to allow other structures to move independently	Moves in a circular pattern easily, uses isolated bite to bite off a variety of foods
Lips	Close around the nipple	Not yet able to move together completely to take food off of spoon	Upper lip can close to pull food off of a spoon, pull liquid from a cup	Full upper lip movement while eating and drinking
Tongue	Moves forward and backward	Moves forward and backward, begins to move to the side to track food	Moves from side to side to track food	Transfers food from one side of the mouth to the other
Cheeks	Fat pads assist with sucking	Assist with keeping the food over the teeth	Assist with keeping the food over the teeth	Assist with keeping the food over the teeth

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	Impact of a cleft lip/palate on feeding ● Cleft lip and cleft palate do *not* indicate a swallowing problem or increased risk of aspiration. ● The whole system of feeding and swallowing is one of positive and negative pressures. When there is an open lip or palate, that means an infant or child cannot create the "vacuum" to safely and efficiently feed. This may lead to increased risk for aspiration if not fed properly. It also likely reduces feeding efficiency leading to difficulty with growth and weight gain. ● A cleft lip/palate will impact feeding in the following ways: *Infant feeding* ○ The opening in the lip or palate makes it difficult for an infant to get suction for feeding. This may lead to trouble breastfeeding or bottle feeding and the child may need special bottles or nipples. ○ Feeding may take longer. Infants may have a weak suck and tire more easily. ○ Milk may leak from the nose during feedings due to the opening between the mouth and the nose. ○ Infant will have increased gas from swallowing too much air. *Child feeding* ○ Ideally, a cleft lip/palate is repaired early in life, before spoon feeding begins. A late repair will impact spoon feeding; however, children with unrepaired clefts usually do fine if they are positioned upright and given appropriate food textures. The thicker consistency of complimentary foods (versus liquid breast milk) is less likely to be regurgitated in the nose. ○ Children with unrepaired cleft lip/palate should still be able to advance oral motor skills (the way their jaw, lips, cheeks and tongue move) if they are not experiencing gross motor delays and textures are being advanced properly. They will likely compensate in some minor ways; their feeding may not look typical, it may even look messy, but they should be able to advance when given the right opportunities.
Evidence of Learning	● Participants will identify 2 foods from each food group that can be modified and given at each developmental stage. ● Participants will be able to match food textures to feeding skills.

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Topic	Tolerance to Texture and Readiness to Advance		
Learning Objectives	Participants will be able to identify signs of tolerance and readiness by children for advanced food textures.		
Learning Activity	Description	Time	Materials Needed

	Feeder and eater types activity:
	● Divide participants into pairs.
	● Ask each pair to determine who will play the role of the feeder and the eater.
	● Hand the feeder a "feeder card" and the eater an "eater card." Participants should not share what is on their card with their teammate.
	● Ask participants to act out what is on their card as they proceed with the meal.
	● Facilitate a discussion with participants around the activity by asking the following questions:
	  ○ How did it feel to have your cues ignored?
	  ○ What non-verbal communication did you give around feeding?
	  ○ How did the feeders and eaters try to communicate with their bodies?
	  ○ What parts of your body were used?
	● Synthesize information shared by participants and summarize signs of readiness.
	● Review Interest and Disinterest handout with participants.
		30 minutes	● Interest and Disinterest in Food handout
			● Feeder index cards labeled with:
			  ○ Aggressive
			  ○ Dismissive
			  ○ Stressed
			● Eater index cards labeled with:
			  ○ Aggressive
			  ○ Dismissive
			  ○ Sleepy
			  ○ Stressed
			● Spoons
			● Yogurt/apple sauce/pudding
			● Napkins
			● Hand Sanitizer
			● Water
			● PowerPoint

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Trainer's Notes	**How do children communicate their needs without words?** Children communicate their needs without words by using their bodies, heads, mouths, and eyes. *Positive signs:* • Leaning in • Opening the mouth for more • Looking at the feeder awaiting next bite • Swallowing the food • Making excited noises • Calm, happy *Negative signs:* • Leaning back, away from the spoon • Closing mouth • Trying to get out of the seat • Turning head away from the spoon, not moving forward to eat from the spoon • Hitting the spoon with hand • Closing eyes • Crying • Sleeping • Scared eyes *Lack of readiness for advanced textures:* • Tongue thrust to push the food out, shows lack of readiness to suckle and swallow the food. • Gagging indicates that the texture of the food was surprising to the child or that they are not quite ready for that texture yet. • This does not mean the feeding has to stop. If the child is still happy, you can continue to offer practice. • Stop as soon as stress or resistance are noted.

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Evidence of Learning	• Participants will identify 2 ways a child shows comfort with eating. • Participants will identify 2 signs that a child is not ready for advanced textures.

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Topic	Considerations When Feeding Children with An Open Cleft		
Learning Objectives	Participants will be able to counsel mothers on tips for spoon feeding and cup drinking for children with unrepaired cleft.		
Learning Activity	Description	Time	Materials Needed
	Cup-drinking activity ● Divide participants into pairs. ● Pass out 1 cup to each participant and make sure everyone has access to scissors. ● Demonstrate how to make a cut-out cup. ● Ask the help of a volunteer to demonstrate proper technique of giving sips of water using cut-out cup. ● Ask participants to make their own cut-out cup and to practice giving each other small, controlled sips of water. ● Debrief with participants about their experience and summarize cup-drinking recommendations for children with cleft lip/palate.	15 minutes	● 1 Dixie cup, paper cup, or cut-out cup per participant ● Water ● 3- 5 pairs of scissors to share ● PowerPoint

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Trainer's Notes	**Tips for cup drinking** • Cup drinking is very important for children with clefts. Cups are sometimes started soon after birth since an infant with a cleft cannot produce enough suction to siphon milk out of a bottle, if no specialty bottles are available. Plus, cups are more sanitary than bottles and teats. • At the very latest, start the cup about 1 month after starting spoon feedings or by age 6-7 months. • Gently tip the cup to provide a small amount of liquid into the infant's mouth. • Do not pour milk into an infant's mouth. Allow an infant's tongue to slurp milk out of cup. • Expect children to cough and spit out some of the liquid at first. An infant will cough more if milk is poured into the mouth. • If coughing is not lessening, thicken the liquid by adding a small amount of pureed fruits or vegetables. This will slow the fluid and make drinking easier to learn. • To start, choose one meal or snack to consistently give liquid from a cup. Always offer the cup during this chosen meal.		
Learning Activity	Description	Time	Materials Needed
	Spoon-feeding activity • Ask the help of a volunteer to demonstrate proper technique of spoon feeding. • Participants practice feeding each other with spoon slowly, allowing time to swallow, checking mouth for food, and giving a bite from an "empty" spoon. • Debrief with participants about their experience and summarize spoon feeding recommendations for children with cleft lip/palate. • Discuss with participants general feeding considerations and ways to deal with nasal regurgitation.	15 minutes	• 1 spoon per participant • Yogurt, apple sauce or pudding • PowerPoint

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Trainer's Notes	**Tips for spoon feeding** • Swallowing is less efficient due to the open palate. • Offer small bites. • Feed slowly, allowing time to swallow between bites. • Before offering the next bite, check the mouth to be sure the food has been swallowed. • If food remains in the mouth, give a "bite" from an empty spoon. This will trigger a swallow and help to clear the mouth. • Finish meal with a drink of water to help to clean food from the cleft and nasal passage. • If the infant loses a lot through their nose, try giving smaller bites each time and go more slowly. Most children will learn this skill well with time. **General feeding considerations** • Children should start spoon feeding at a typical age or earlier if no access to a reliable nutrition source via bottle or cup. • Start cup drinking shortly thereafter, if has not been introduced already. • Children with clefts have many negative experiences around their faces. They need the positive experience of eating more than other children do. • Remember the signs of feeding enjoyment. If this becomes stressful or negative, take a break and try again later in the day. **Dealing with nasal regurgitation** • There is an open passageway for food to go up and out the child's nose. Food coming out the nose may be uncomfortable but is not harmful. • Remain calm. Use neutral words, tone of voice, and body language. • Use a soft, clean cloth to gently pat food from nose, being very gentle. • The child will likely sneeze, which helps to clear the nasal passage. • Children will learn how to manipulate each texture around their cleft to limit nasal regurgitation. • Finish the feeding with a small drink if clean water to clear the nasal passages.

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Evidence of Learning	• Participants will explain the importance of spoon feeding and cup drinking for children with cleft lip and palate. • Participants will describe methods for dealing with nasal regurgitation. • Participants will demonstrate proper technique for cup drinking and spoon feeding.

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LESSON 5: Addressing Malnutrition in Children

TARGET AUDIENCE: Hospital Health Staff and Community Health Workers

LEARNING GOALS:

- Participants will understand the role of various foods in growth and health of children.
- Participants will learn strategies to increase the nutritional value of traditional foods.
- Participants will learn food safety and hygiene guidelines to prevent diarrhea and malnutrition.

TOPICS:

1. Food Choices for Children
2. Increasing Nutritional Value of Traditional Foods
3. Food Safety and Hygiene

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Topic	Food Choices for Children		
Learning Objectives	• Participants will be able to list food groups and their functions.		
Learning Activity	Description	Time	Materials Needed
	Food groups • Write the nine food groups below on colored index cards, one food group per index card. Use the same card color for the food groups listed together (total of 4 different colors) as such: 1. Cereal and grains; Roots and tubers 2. Animal protein foods; Legumes and pulses; Dairy 3. Vegetables; Fruits 4. Oils and fats; Sugars • Pair participants and assign each pair 2-3 food groups of different color. • Ask pairs to write commonly consumed foods on the back of each index card. • Ask each pair to share and other groups to contribute additional foods if needed.	30 minutes	• Index cards • Markers • PowerPoint

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Trainer's Notes	**Food groups** • Cereals and grains (e.g. maize, millet, wheat, rice) • Roots and tubers (e.g. cassava, sweet potatoes, potatoes) • Animal protein foods (e.g. meat, chicken, fish, eggs, caterpillars, flying ants, grass-hoppers) • Legumes/pulses (e.g. peas, beans, groundnuts, bambara nuts, soya beans) • Dairy (e.g. milk, cheese, butter) • Vegetables (e.g. tomato, cabbage, pumpkin leaves, bean leaves, spinach) • Fruits (e.g. mango, lemon, paw-paw, melon) • Oils/fats (e.g. red palm oil, margarine, sunflower seed oil; groundnut, soybean or corn oil) • Sugars (e.g. sugar cane, honey, soda)		
Learning Activity	Description	Time	Materials Needed

	Food for energy
	• Show slide of children active/playing and studying.
	• Facilitate a discussion by asking the following questions:
	  ○ What are examples of activities that need energy?
	  ○ Do you think children with cleft and palate may need extra energy? Why or why not?
	  ○ Where do children get that energy from?
	  ○ Some foods are very good for energy. Which food groups belong under "Energy"? Ask participants to come up and stick the index cards on the flip chart.
		10 minutes	• Flip chart sheet labeled with "Energy", "Growth", "Protection" (with enough space under each for 2-4 index cards)
			• PowerPoint

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Trainer's Notes	**Food for energy** • Playing, studying, breathing, digesting, eating. Energy is needed in the body if it is to do any work. It is needed in movement, breathing and in any activity (physical and mental). It is required for a healthy body. • Children with cleft lip and palate may need extra energy especially after surgery, if they have feeding difficulties, or are malnourished. • Children get energy from food; the body convers food to energy, and energy to activity. • Food groups that are best at providing energy are Cereal and grains, Roots and tubers, Oils and fats, and Sugars. • All foods make it possible for children to play and learn – they provide energy. However, some foods like maize, cassava, sugar, honey, millet, sorghum, sweet potatoes, palm oil, cooking oil and fat provide more energy. Staple foods like cassava, maize or rice are often the main sources of energy.		
Learning Activity	Description	Time	Materials Needed

	Food for growth
	• Show slide of two children of the same age, one is stunted.
	• Facilitate a discussion by asking the following questions:
	  ○ What is the difference between these two children?
	  ○ Who is Mary and who is Hellen?
	  ○ Why is Mary taller?
	  ○ Some foods are very good for growing or body-building. Which food groups belong under "Growth" or "body-building"? Ask participants to come up and stick the index cards on the flip chart.
		10 minutes	• Flip chart sheet labeled with "Energy", "Growth", "Protection"
			• PowerPoint

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Trainer's Notes	**Food for growth** • The difference between the two children in the photo is that one of them is stunted. Hellen is the child who is stunted. Mary eats more protein compared to Hellen. Hellen's diet is mainly porridge, which is low in protein. • Food groups that are best for "growth" or "body building" are Animal protein foods, Legumes and pulses, and Dairy – all these foods are high in protein. • Protein is needed by the body for physical growth, brain development, repair and healing. In Africa, there is a strong dependence on maize and cassava meal. Maize and cassava meal by themselves (especially cassava meal) do not have enough protein for a good diet, and especially not enough for growing children. As a result, children's bodies and brains do not have the chance to grow properly. Often this is not even noticed – people just think the children are thin and small. • For a good diet, maize meal and cassava meal need to be eaten with foods that are rich in protein (e.g. beans, cowpeas, groundnuts, soya beans, meat, fish, caterpillars, crickets, eggs and milk).		
Learning Activity	Description	Time	Materials Needed

	Food for protection
	• Show photos of two children, one with anemia, one with vitamin A deficiency (the most common deficiencies in Africa).
	• Facilitate a discussion by asking the following questions:
	  ○ What makes children "protected" from illnesses?
	  ○ Some foods are very good for health and for preventing illness. What are examples of these illnesses?
	  ○ Which food groups belong under "Protection"? Ask participants to come up and stick the index cards on the flip chart.
		10 minutes	• Flip chart sheet labeled with "Energy", "Growth", "Protection"
			• PowerPoint

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Trainer's Notes	**Food for protection** • Nutrients like vitamins (vitamin C, vitamin A) and minerals (iron) protect children from illnesses like infections, anemia, and night blindness. • Many foods provide nutrients that keep children health but the food groups that are best for protection are Vegetables and Fruits. • The body needs vegetables and fruits to be able to fight disease, be strong and have enough good blood. • To summarize, foods are groups based on their best qualities. Some are very good at providing children energy, others are very good at helping children grow, and some are special foods that are very good at making children stay healthy and prevent illness. Children need to eat foods from all three categories to growth and thrive.
Evidence of Learning	• Participants will be able to list the foods groups and at least 3 foods under each group. • Participants will be able to identify food groups based on their main function - Energy, Growth, or Protection.

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Topic	Increasing Nutrition Value of Traditional Foods		
Learning Objectives	• Identify nutrient-dense and energy-dense foods. • Increase the nutritional value of traditional foods.		
Learning Activity	Description	Time	Materials Needed
	Nutrient-dense foods • Show slides comparing two foods. • Ask participants to select the food that is more nutrient-dense. • Explain the difference between nutrient-dense and energy-dense foods and facilitate a discussion of local examples of each.	10 minutes	• PowerPoint

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Trainer's Notes	**Nutrient-density versus energy-density** • Nutrient-dense foods provide high amounts of protein, vitamins, and minerals compared to number of calories they supply. • Energy-dense foods provide a lot of energy (calories) like foods high in sugar and fat. • When choosing foods for energy, growth, or health, it is important to offer children foods that are nutrient-dense. • A food can be both nutrient- and energy-dense. Examples include meat, nuts, and eggs. • If a child is malnourished, we should offer foods that are nutrient- *and* energy-dense. • If a child has poor appetite or is able to eat only small amounts at meals, we should offer foods that are nutrient- *and* energy-dense without increasing the volume by much.		
Learning Activity	Description	Time	Materials Needed

	Increasing the nutritional value of porridge
	• Facilitate a discussion by asking the following questions:
	  ○ What are traditional porridges in your countries made of?
	  ○ What is the main role of these foods?
	  ○ Is growth one of their main roles? Why or why not?
	  ○ Are they really meant to prevent illness? Why or why not?
	• Divide participants in groups of 3. Ask each group to come up with a recipe to improve the nutritional value of a traditional porridge (or other traditional foods children eat) without increasing their volume by much. This means making them more nutrient-dense and/or energy-dense.
	• Ask groups to share their recipes with the class.
		20 minutes	• Flip chart sheet
			• PowerPoint

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Trainer's Notes	**Increasing the nutrition value of traditional food** Traditional porridges are based on maize or cassava. Their main role is to provide energy. They can support a child's growth only when they are offered with protein foods. They can prevent illness when they are offered with foods high in vitamins and minerals. *Possible recipes:* • Adding pounded groundnuts, beans or dried fish flour (growth and energy). • Adding a teaspoon of shredded or pounded green leafy vegetables, e.g. pumpkin, sweet potato leaves, bean and cowpea leaves, amaranthus, rape or Chinese cabbage to every feed (protection). • Adding red palm oil or vegetable oil (1 tsp) (energy and protection). • Adding fatty fish or meat (energy and growth).
Evidence of Learning	• Participants will be able to identify nutrient-dense and energy-dense foods. • Participants will be able to modify recipes of traditional foods to increase their nutritional value.

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Topic	Food Safety and Hygiene		
Learning Objectives	• Participants will learn food safety guidelines and tips to prevent diarrhea and malnutrition. • Participants will learn the proper steps for hand washing.		
Learning Activity	Description	Time	Materials Needed
	Importance of food safety and hygiene Facilitate a discussion with participants around importance of food safety and hygienic practices in prevention of diarrhea and malnutrition. • This lesson is about prevention of malnutrition and food choices. Why are we then talking about food safety and hygiene? *(Probing: what is the connection between hygiene and malnutrition? What if hygiene is poor? Could that cause diarrhea and therefore, malnutrition?)* • In your experience, what causes diarrhea in children? • What steps do you take to try to prevent infections in your work/home?	5 minutes	• PowerPoint

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Trainer's Notes	**Diarrhea and malnutrition**
	• According to the WHO, diarrhea:
	  ○ is the second leading cause of death in children under age five
	  ○ kills around 760, 000 children under age five each year
	  ○ is a leading cause of malnutrition in children under 5 years of age
	  ○ is often caused by poor water, sanitation and hygiene, and
	  ○ is both preventable and treatable.
	• Diarrhea is caused by
	  ○ contaminated food
	  ○ contaminated water, and
	  ○ person-to-person contact.
	
	Preventing malnutrition by practicing food safety and hygiene
	Improving sanitation and food preparation practices can reduce children's risk for diarrhea and related malnutrition. Three key strategies to preventing diarrhea include
	• Hand washing
	• Safe Drinking Water
	• Safe Food Preparation and Handling		

Learning Activity	Description	Time	Materials Needed

	Hand washing practices
	• Facilitate a discussion around hand washing practices by asking the following questions:
	  ○ How do families you work with wash their hands?
	  ○ Do you think hygiene is an issue in the communities where you work? Why or why not?
	  ○ Why do you think hand washing is important?
	  ○ How do you typically wash your hands? What steps do you take? What supplies do you use?
	• Ask a volunteer to demonstrate proper hand washing.
		15 minutes	• PowerPoint
			• Soap
			• Pitcher of tap water
			• Basin

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Trainer's Notes	**Hand washing**
	• During regular daily activities, hands come in contact with hundreds of surfaces – from opening doors to cooking food, from money exchanges to shaking hands. On each surface live thousands of microscopic organisms, some of which can cause serious illness.
	• Regular hand washing is:
	  ○ Shown by scientific research to significantly reduce the risk of diarrhea and respiratory infection.
	  ○ The simplest and most cost-effective way to prevent disease.
	
	Steps for proper hand washing
	• *Wet* – Wet hands thoroughly with clean water.
	• *Soap* – Use a bar of soap or apply liquid soap to the palm of the hands.
	• *Lather* – Using the soap, rub hands together vigorously for 20 seconds so the soap produces a thick lather. Scrub between the fingers and under the fingernails.
	• *Rinse* – Rinse hands of the soap lather thoroughly with clean water.
	• *Dry* – Dry hands with a clean paper or cloth towel or let them air dry.
	
	When hand should be washed
	• Before and during food preparation
	• Before and after hand expressing milk
	• Before and after preparing infant formula or cow's milk
	• Before and after feeding a child
	• Before and after eating
	• Before and after changing a diaper
	• After using the bathroom
	• After coughing, sneezing or blowing the nose
	• After caring for a sick child
	• After handling garbage
	• After touching cleaners and toxic chemicals
	• After touching livestock or pets

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	Description	Time	Materials Needed

Learning Activity	**Safe food and water**
	• Facilitate a discussion with participants on common practices around food and water safety by asking the following questions:
	  ○ How do you make water safe for drinking?
	  ○ Can someone share the proper steps for boiling water?
	  ○ How do you typically handle and prepare produce?
	• Share with participants guidelines for food storage and safety.
		10 minutes	• PowerPoint

Trainer's Notes	**Safe drinking water**
	• Water can be unsafe to drink due to water-borne pathogens (e.g. bacteria, viruses, parasites).
	• Water should be boiled to make it safe to use for drinking, food preparation, and hand washing. Boiling is the most reliable and cost-effective way to make water safe to drink because it kills disease-causing bacteria, viruses and parasites. Steps to properly boil water include:
	  ○ Bring cold tap water to a rolling boil.
	  ○ Boil for one minute (3 minutes at higher altitudes).
	  ○ Cool the water to room temperature.
	  ○ Store water in sterile containers with tight-fitting lids.
	• To keep drinking water safe from contamination:
	  ○ Make sure the storage container has been thoroughly washed and sanitized.
	  ○ Keep the container's lid secured.
	  ○ Do not touch the drinking water in the container with unwashed hands. Keep in mind that when using a cup or bottle to scoop water from a larger container, hands are likely to touch the water.
	  ○ Do not use a communal drinking cup to scoop water from the container.
	  ○ Use a clean ladle to distribute water into drinking cups.
	  ○ Use a container with a spout or spigot to deliver drinking water.
	
	Safe food preparation and handling		

- When preparing food for infants and young children, it is critical that foods are handled in a way that limits the risk of food-borne illness. This includes washing, preparation and storage.
- In order to keep food safe, it is important that it be stored properly. The two ways food is most commonly stored are refrigeration and dry storage.

Refrigeration (if available)

- Bacteria can multiply on perishable foods, such as meat and dairy products, if they are left at room temperature for over two hours. In hot climates, bacteria grow even more rapidly – after 1 hour! Refrigerating food in a timely manner can help prevent illness among children.
- Refrigerators should be kept between 0° C and 5° C. The following foods should be kept refrigerated to prevent spoilage:
  - Expressed breast milk, prepared infant formula, or cow's milk formula
  - Meat, poultry and eggs
  - Dairy products
  - Cut and peeled fruits and vegetables
  - Leftover food from previously prepared meals
- Even with refrigeration, many foods can still spoil. Check foods regularly for signs of mold or spoilage.

Dry Storage

- Foods such as some produce, dry goods and canned foods can be stored unrefrigerated without spoiling. However, these foods may spoil if exposed to moisture or extreme heat.
- When storing food:
  - Protect from extreme heat and moisture
  - Protect from pest infestation, such as insects or rodents
  - Avoid chemical contamination
- Dry storage tips:
  - Store food in a cool, dry place no more than 27° C (80° F)
  - Transfer bagged foods into airtight plastic, glass or metal storage containers
  - Store food off the ground
  - Check dry stored foods often for pests or spoilage
  - Throw away foods that are past the expiration date on the manufacturer's container, and foods that show signs of pest infestation, mold or spoilage

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- Store food separately from chemicals (separate shelves, closets, etc.)

Fresh produce handling Dos and Do Nots
We learned that fruits and vegetables are an important component of a healthy, balanced diet. However, diarrhea-causing bacteria and other pathogens can live on the surface of many fruits and vegetables, and so they must be handled and prepared properly.

Do

- Wash hands before and after handling.
- Wash produce only when ready to use.
- Remove outer layers of leafy vegetables and cut away portions of produce that are bruised or damaged.
- Check produce regularly for signs of mold or spoilage.
- Wash and sanitize food preparation surfaces, cutting boards, knives and other utensils before and after preparation.
- Wash produce in clean water with a scrub brush to dislodge dirt.
- Refrigerate fruits and vegetables within 2 hours of cutting and peeling (if refrigeration available).

Don't

- Wash fresh produce before storing.
- Serve peeled and cut produce that has been at room temperature for over 2 hours.
- Use soap or detergent to wash produce.
- Use produce that shows signs of pest infestation, mold or spoilage.

Tips for preventing cross-contamination

- Use separate cutting boards for raw fruits and vegetables and for raw meat, poultry, seafood and eggs.
- Use separate plates and utensils for cooked and raw food.
- Before using again, thoroughly wash cutting boards, plates and utensils that previously had contact with raw meat, poultry, seafood and eggs.
- Wash your hands between tasks.
- Store meat, poultry, seafood and eggs separately from other foods in a refrigerator, if available.

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Evidence of Learning	• Participants will be able to make recommendations on proper hand washing and safe food preparation and handling.

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LESSON 6: Post-Surgery Diet

TARGET AUDIENCE: Hospital Health Staff and Community Health Workers

LEARNING GOALS:

- Participants will describe general recommendations to protect palate immediately following repair.
- Participants will identify skills learned before surgery that will help children during recovery.
- Participants will describe post-surgery oral care.

TOPICS:

1. Immediate Post-Cleft Surgery Diet
2. Promoting Smooth Recovery Post-Cleft Surgery

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Topic	Immediate Post-Cleft Surgery Diet		
Learning Objectives	Participants will describe general recommendations to protect palate immediately following repair.		
Learning Activities	Description	Time	Materials Needed
	Post-surgery activity • Asks participants to try to suck while keeping their mouths and lips tightly closed, pretending that there is a bottle nipple in their mouth. This works best when the jaw remains fairly tightly closed. • Ask participants to describe what it felt like. *(Probe: did you feel the pressure on your palates?)* • Facilitate a discussion around what a child's diet should look like and other recommendations for the first 2 weeks after surgery to facilitate healing.	20 minutes	• PowerPoint • Post-Surgery Diet handout

Trainer's Notes	**General post-surgery recommendations**
	• Caregivers should note that eating and drinking will feel very different. It may take a couple of weeks for the child to get comfortable with their new anatomy. They may have increased gagging as they "test their new abilities."
	• Child may be less interested in eating immediately following surgery. To help with this,
	  ○ offer foods just when pain medication is fresh and
	  ○ monitor hydration status.
	• Children cannot feel their palates. They should not be allowed to self-feed for 1-2 weeks.		

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- Food and liquid may continue to come out of the child's the nose while healing takes place. *This does not indicate an unsuccessful repair.*
- If arms are not restrained, caregivers need to be observant to keep children from putting their hands in their mouth.
- To keep the palate clean, rinse the mouth or give a drink of clean water after each meal or sugary drink.

Recommended diet following the repair surgery

- *Week one - "no chew" diet*
    - Liquids by an open cup
    - Juice
    - Broth (not too hot)

- *Week two - "soft chew" diet*
    - Liquids and smooth pureed foods provided by a spoon that is offered sideways
    - Custard/pudding
    - Porridge without added meat or veggie

- *Week three*
    - Standard diet

- *Foods to avoid for the first 2 weeks post-surgery*
    - Hot food and drink
    - Hard food with pieces
    - Breastfeeding (for one week post-surgery)
    - Lollipops

- *Items to avoid for the first 2 weeks post-surgery*
    - Bottle
    - Sucking on fingers
    - Pacifier
    - Toothbrushes

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	○ Hard, small toys ○ Straws ○ Fork
Evidence of Learning	• Participants will be able to identify 2 household items to avoid for the first 2 weeks post-surgery. • Participants will be able to describe the appropriate texture of the diet for the first week post-surgery. • Participants will be able to describe the appropriate texture of the diet for the second week post-surgery.

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<table>
<tr><th>Topic</th><th colspan="3">Promoting Smooth Recovery Post-Cleft Surgery</th></tr>
<tr><td>Learning Objectives</td><td colspan="3">Participants will describe positive feeding practices to promote smooth recovery from cleft palate surgery.</td></tr>
<tr><td rowspan="2">Learning Activity</td><td>Description</td><td>Time</td><td>Materials Needed</td></tr>
<tr><td>Recovering from palate surgery discussion
Facilitate a discussion with participants on factors that would lead to positive feeding experiences and help a child recover from surgery more smoothly. (Probe: what actions can be taken prior to surgery to help the child have a speedier recovery?)</td><td>15 minutes</td><td>PowerPoint</td></tr>
<tr><td>Trainer's Notes</td><td colspan="3">Recommendations for smooth recovery from cleft surgery
A child who had a positive association with eating and who trusted his caregivers before surgery will quickly regain an enjoyment of food following palate repair surgery. The following recommendations will help support positive feeding experiences and therefore, will help recovery from surgery go more smoothly:
Teach children cup drinking early (4 months or sooner), as it will be necessary post-surgery.
Help children develop a positive relationship with food and enjoy the act of eating.
Allow children to enjoy a variety of flavors by offering a diverse diet.
Expose children to a variety of food textures that are appropriate to their feeding skills.
Early on, help children build an attachment to a soft toy so they can safely soothe themselves post-surgery.</td></tr>
<tr><td>Evidence of Learning</td><td colspan="3">Participants will identify 2 actions that can be taken prior to surgery to help the child have a speedier recovery.</td></tr>
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