यह कार्यक्रम स्वास्थ्य विभाग और राज्य स्वास्थ्य एवं परिवार कल्याण संस्थान (SIHFW), उत्तर प्रदेश की पहल पर उत्तर प्रदेश टेक्निकल सपोर्ट यूनिट (UPTSU) के सहयोग से हो रहा है।

Principal Secretary, Medical Health & Family Welfare, U.P.
Shri Partha Sarthi Sen Sharma

Director Administration & Director, SIHFW
Dr. Rajaganapathy R

एपिसोड 15

स्वास्थ्य विभाग की पहल

शुक्रवार की शाम, डाक्टर्स के नाम

प्रदेश के जाने-माने चिकित्सकों से सीधे जुड़ें और उनके अनुभवों का लाभ उठाएँ

दिनांक : 21 जून, 2024 | समय : सांय 6:00 बजे से 7:30 बजे तक

— वेबकास्ट का विषय —

नवजात शिशु की देखभाल, स्तनपान, श्वसन रोग, डायरिया और प्रबंधन

वक्ता

डॉ. मोहम्मद सलमान खान

(MBBS, DCH)

सीनियर कंसल्टेंट, बाल रोग विभाग,
वीरांगना अवंती बाई महिला चिकित्सालय, लखनऊ

आयोजक

राज्य स्वास्थ्य एवं परिवार कल्याण संस्थान (SIHFW)
इंदिरा नगर, लखनऊ, उत्तर प्रदेश

YouTube LIVE STREAMING

Newborn care, Breastfeeding, respiratory illnesses, diarrhea and management

Dr. Mohd. Salman Khan

Senior Consultant(Pediatrics)

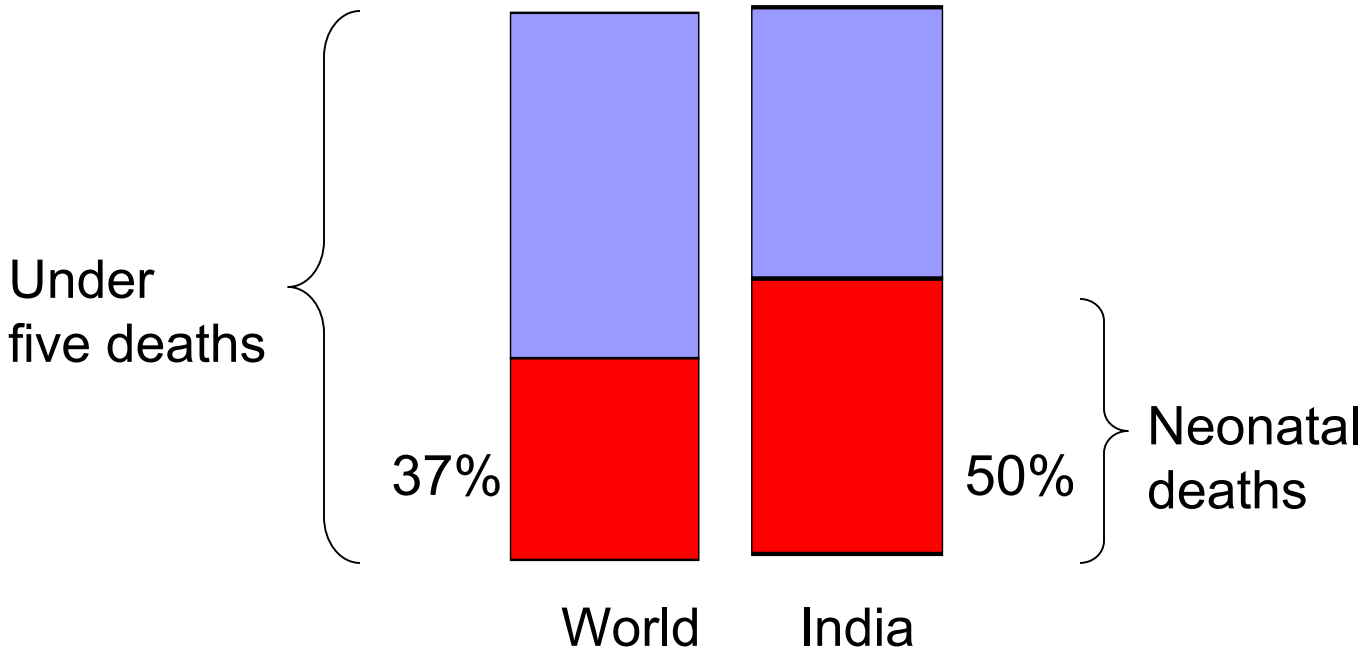
Veerangana Avanti Bai Mahila Chikitsalaya,

Lucknow

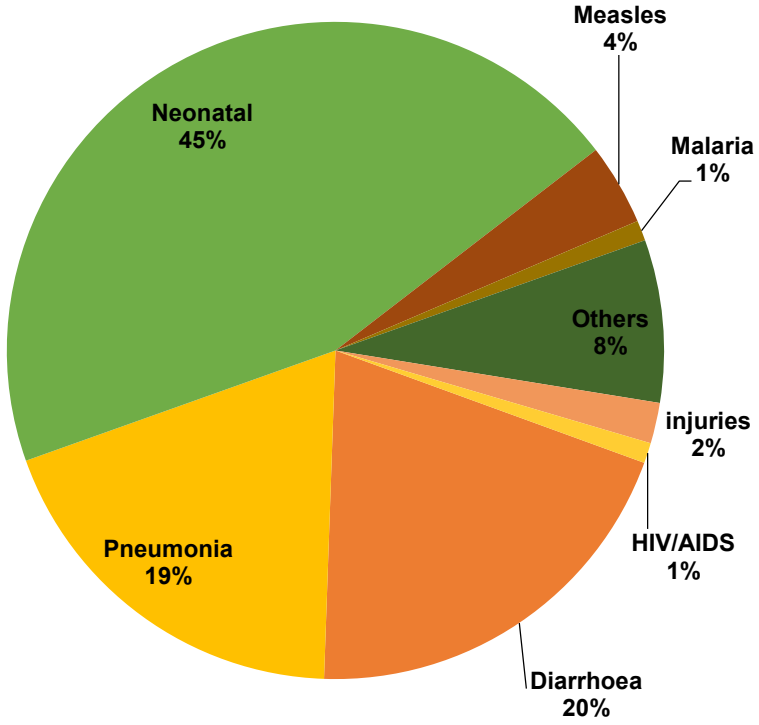
CARE OF NEW BORN AND BREAST FEEDING

Neonatal Deaths

Neonatal deaths are a major contributing factor to U5 mortality in India



Major causes of U5 mortality



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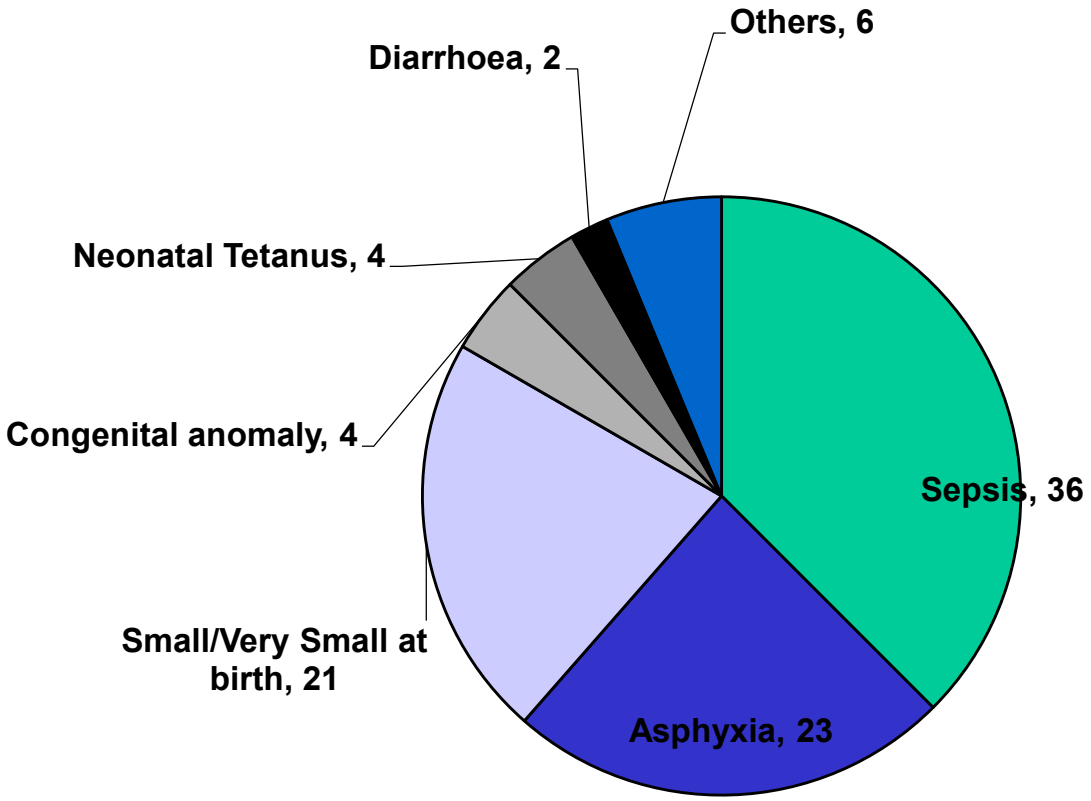


Causes of Neonatal Deaths

Who is normal Newborn ?

- BW ≥ 2500 gram
- GA ≥ 37 wk
- BW between 10th to 90th percentiles
- No need for assisted ventilation or beyond for resuscitation at birth
- Apgar score ≥ 7 at 1 minute
- No postnatal illness i.e. RD, Sepsis, Hypoglycemia, Polycythemia etc.

Essential Newborn Care Interventions

- Clean childbirth and cord care

  Prevent newborn infection

- Thermal protection

  Prevent & manage newborn hypo/hyperthermia

- Early and exclusive breastfeeding

  Started within 1 hour after childbirth, as soon as possible

- Initiation of breathing and resuscitation

  Early asphyxia identification and management

Essential New Born Care – For normal crying / breathing baby

Weight

- Term babies lose weight during the first 2 to 3 DOL
- Weight loss- usually up to 5 to 7 percent of birth wt
- Remains static during next 1to 2 days and birth wt regained by 7-10 days
- The average daily weight gain in term babies - around 30 g, 20g and 10g during the first, second and third, 4-month periods respectively during the first year of life.
- Baby gains about 800 gms /month during the first 3 months

Where do babies go from delivery room?

Refer if:

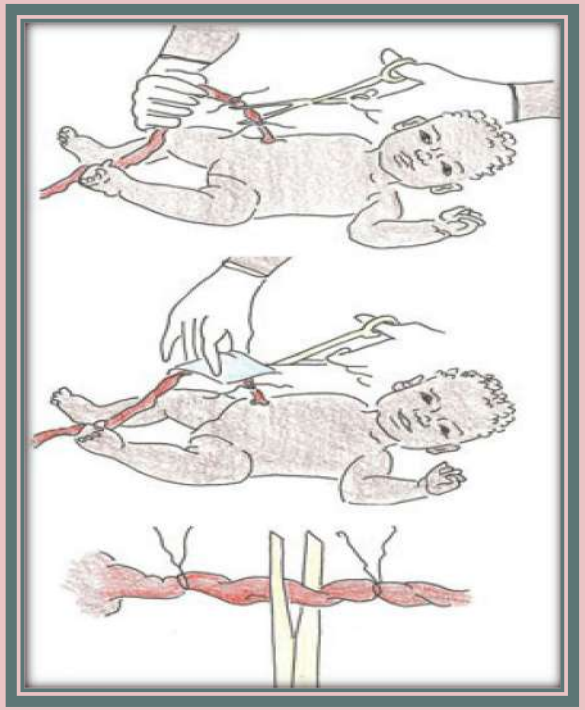
- Birth weight <1800 gms, <34 weeks
- Major congenital malformation
- Severe birth injury
- Respiratory distress
- PPV >1 minutes or needing chest compression or drugs

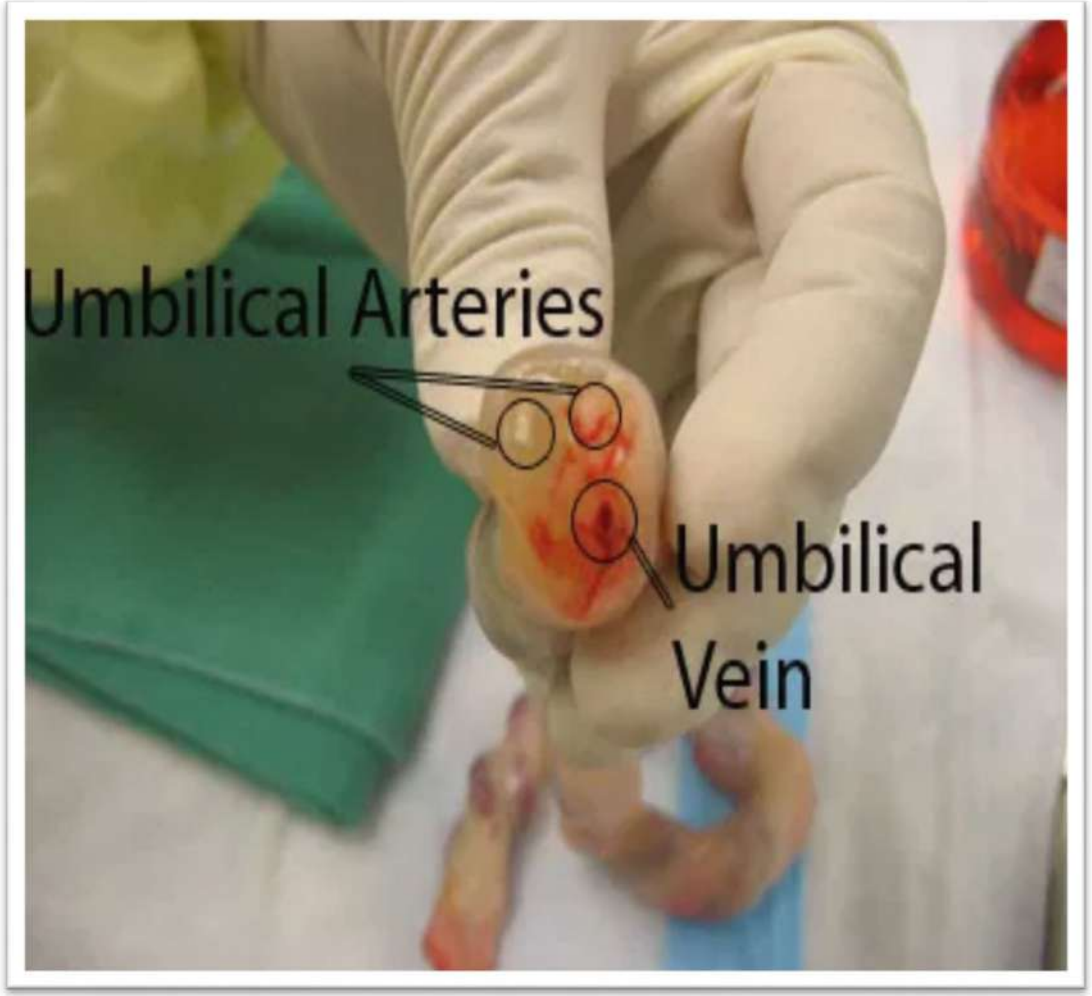
Issues in golden hour

- **Cleaning of the baby**
  - No removal of vernix
- **Identification band**
  - Customized
  - Commercial
- **Recording of weight**
  - Electronic weighing scale
  - 5 gm precision
  - In minimal clothes

Immediate cord care

- Clamp and cut cord with a sterile instrument.
- Tie the cord between 2 to 3 cms from the base and cut the remaining cord
- Observe for oozing blood
- DO NOT apply any substance to stump.
- DO NOT bind or bandage stump.
- Leave stump uncovered.
- Watchful for slipped cord clamp
- **Nappy to be folded below the umbilicus**

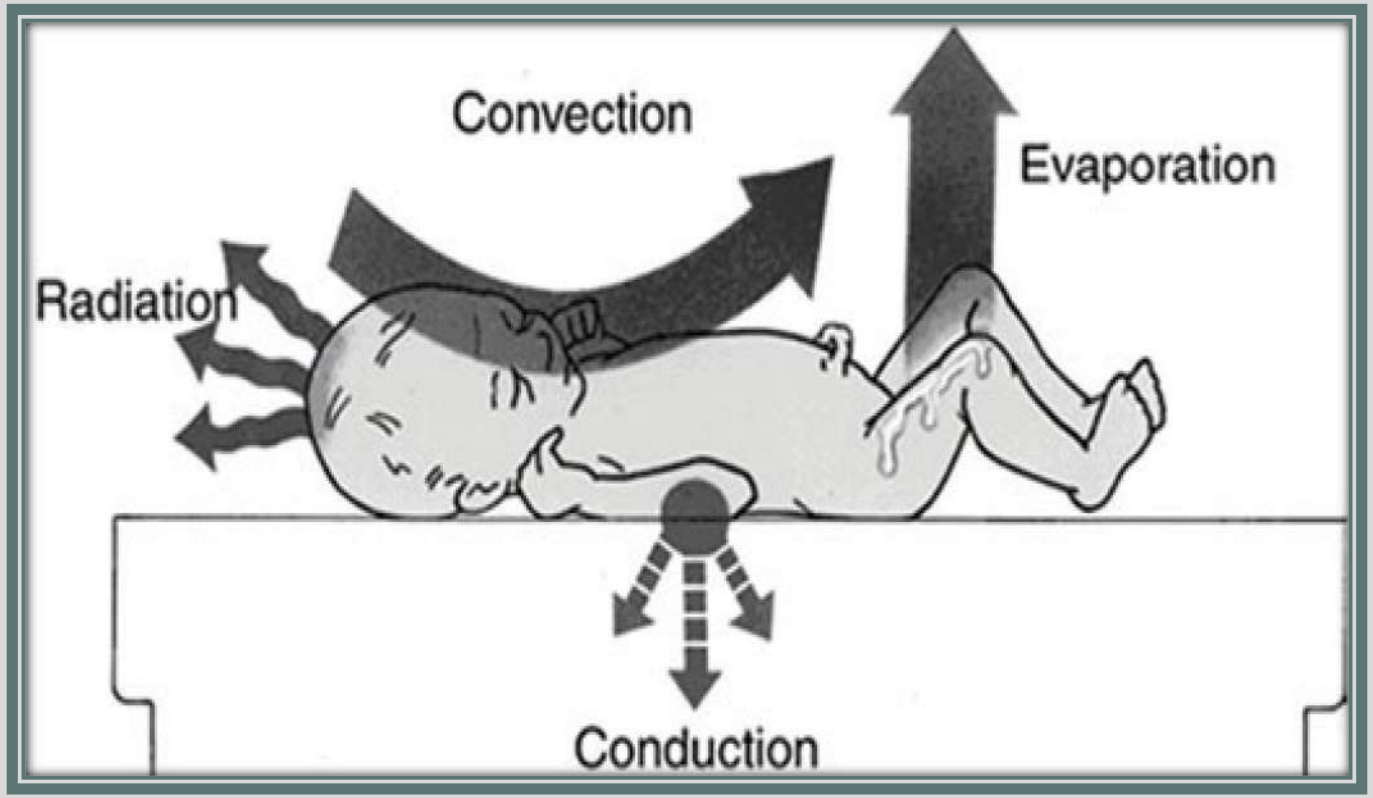




Single umblical artery

Persistent rt umblical vein

Newborn can lose heat in four ways



Keeping a newborn baby warm at delivery

Method of heat loss	Prevention
Evaporation: Wet baby	Immediately after birth dry baby with a clean, warm, dry cloth
Conduction: Cold surface e.g weighing scale etc.	Put the baby on the mother's abdomen or on a warm surface
Convection: Cold draught	Provide a warm, draught free room for delivery at ≥25^{o}C
Radiation: Cold metallic surroundings	Keep the room warm

Screening

- Congenital hypothyroidism
- Congenital Adrenal Hyperplasia
- G 6 PD Deficiency disorder
- Pulse oximetry
- Red eye reflex
- Hearing screening

CARE OF NEWBORN IN POSTNATAL WARD

Counsel the mother

- Keep baby warm
- Breastfeed frequently and exclusively
- Advise mother to wash hands with soap and water after using toilet and after cleaning bottom of baby
- Advise mother regarding danger signs and care seeking.

Bathing the baby

Warm room – warm water

Dry quickly & thoroughly

Dress warmly and wrap

Give to mother to breast feed

Ask the mother

- Do you or baby have any problems?
- Has infant passed stools, urine?
- Have you started breast feeding infant?
- Is there any difficulty in feeding infant?
- Do you have any pain while breast feeding?
- Have you given any other foods or drinks to infant? If yes, what and how?

Examine the baby

- Count breaths in one minute
- Look for severe chest indrawing
- Look and listen for grunting
- Look at umbilicus. Is it red or draining pus?
- Look for skin pustules. Are there 10 or more pustules or a big boil?

Examine the baby

- Measure axillary temperature (if not possible, feel for fever or low body temperature)
- See if young infant is lethargic
- Look for jaundice. Are the face, abdomen or soles yellow?
- Look for malformations

1. Vomiting:

- Vomit on first day due to irritation of stomach by swallowed amniotic fluid.
- Vomiting soon after feed is due to faulty technique of feeding.
- The proper advice regarding feeding and burping must be imparted to all mothers.
- If vomiting persists for longer it leads to some other conditions.

2. Failure to pass meconium and urine:

- Healthy babies must void meconium within 24 hours of age & Urine 48 hours of life·
- The babies pass blacks tools during first 2-3 days of life, followed by greenish stools for next 1-2 days.
- The non passage of meconium, should be informed to the pediatrician.

3. Constipation:

- Babies on cow's milk formula are often constipated due to hard casein curds.
- Constipation is best managed by giving frequent breastfeeding.
- The laxatives should be avoided.

4. Loose Stools

- The breastfeed babies develop increases frequency of stools if the mother is taking ampicillin, cephalosporins, tetracyclines, certain laxatives and following excessive consumption of foods with high organic acid content
- such as oranges, cherries, tomatoes and chilies.
- The intake of large quantities of glucose water and honey by the baby may result in diarrhea.
- Diarrhea may also occur due to overfeeding or serious underfeeding.

5. Physiological Jaundice:

- Physiological jaundice appears on the second day of birth, reaches peak on the 4 or 5 day and disappears by 8 to 10 days.

6. Hiccups and Sneezing:

- Hiccups are produced by spasmodic contractions of diaphragm and the characterized by sudden, noisy and jerky retractions of suprasterna of notch and xiphisternal region. It occurs usually immediately after a feed due to distension of stomach and irritation of diaphragm.

- Sneezing occurs due to irritation of the nostrils by secretions. It should be sucked out by mucus sucker or using catheter.

7. Fever:

- During summer months when environmental temperature goes above 39°C, some healthy newborn babies may develop fever on the second or third day of life.

- The baby should be dressed with light and loose cotton clothes and the environment kept cool in summer.

8. Excessive crying

- The babies usually cry when they are hungry or discomfort.
- This may be due to unpleasant sensation of full bladder before passing urine, painful evacuation or hard stools or mere soiling by urine and stools.
- The insect bites should also be kept in mind as an important cause of night crying.

9. Oral thrush:

- The infection most commonly occurs during passage of the baby through infected birth canal.
- Infected feeding bottle, contaminated breast nipples and prolonged antibiotic therapy may also result in candidiasis.
- The oral lesions are characterized by discrete white patches or spots over the buccal mucosa and gums.
- The baby may be able to suck normally but swallowing may be difficult due to posterior oropharyngeal white patches.
- Oral application of 0.5% solution of gentian violet after each feed gives prompt response in most cases

10. Mastitis neonatorum:

- The enlargement of breasts occurs in full term babies of both sexes on 3 or 4" day and may last for few days or even weeks.
- Lack of inactivation of progesterone and estrogen after birth due to immaturity of neonatal liver,leads to further rise in their levels thus resulting in hypertrophy of breasts.
- The local massage,fomentation should be curbed and mother reassured.

11. Vaginal bleeding:

- The development of menstural like withdrawal bleeding may occur in above 14 of female babies after 3 to 5 days of birth.

- The bleeding is mild and lasts for 2 to 4 days.The local aseptic cleaning of genitals is advised.

12. Caput Succedaneum:

- It is a boggy, diffuse, edematous swelling of soft tissues of scalp over the presenting part. The swelling is present at birth and its size and severity is related to the duration of labour.

- The swelling is pitting, non fluctuant and not limited by sutures unlike cephalhematoma. It disappears spontaneously over next few days.

Caput succedaneum vs. cephalohematoma

- Normal vs. Abnormal

13. Cephalhematoma:

- It is subperiosteal collection of blood secondary to injury during delivery. The swelling appears after 2-3 days of birth.It is a fluctuant swelling and does not cross the suture line.

- **It resolves spontaneously after a few days or weeks. Incision or aspiration is contraindicated unless it gets infected.**

14. Sore buttocks and Napkin Rashes

- Use of nylon or water tight plastic napkins and delay in changing the napkins causes redness, induration and excoriation due to ammoniacal dermatitis.
- The bottom should be cleaned gently with wet cotton and kept dry and exposed to air.
- Application of soothing ointment or coconut oil provides relief.

15. Erythema toxicum:

- It is erythematous rash with central pallor (wheal-like) appearing on the second or third day in term babies.
- The rash starts on the face and spreads to the trunk and extremities in about 24 hours
- It disappears spontaneously after 2 to 3 days without any specific treatment.

16. Acne neonatorum:

- Typical acne lesions may be seen over the forehead,nose and cheeks at birth in term babies.
- They occur due to transplacental passage of maternal androgens to the fetus.The skin lesions gradually diminish in size and disappear spontaneously within the next few days.

17. Stork-bites (salmon patches or nevus simplex):

- These are discrete pinkish-gray sparse capillary hemangiomata commonly located at nape of the neck, upper eyelids, forehead and root of the nose. They invariably disappear after a few months.

18. Congenital hydrocele:

- A small sac containing fluid may be noticed in one of the scrotal sacs at birth or during first week of life.It disappears spontaneously during first three months of life.

19. Tongue tie:

- It may be either in the form of thin broad membrane or thick fibrous frenulum under the tongue with a notch at the tip of the tongue due to traction.

- Tongue tie interferes with sucking or delay the development of speech. The genuine tongue tie may be snipped after 3 months if it is a source of anxiety to the parents.

20. Congenital teeth:

- The eruption of one or more lower incisor teeth before or soon afterbirth is seen in one in 4000 babies.

- The teeth may become loose and interfere with breastfeeding. There is a risk of spontaneous dislodgement with aspiration. It is advised to get the natal teeth extracted.

21. Subconjunctival hemorrhage:

- Semilunar arcs of subconjunctival hemorrhage located at the outer canthus is a common finding in normal babies. The blood gets resorbed after a few days without leaving any pigmentation.

22. Umbilical hernia:

- When the cord has fallen off,umbilical hernia may manifest after the age of two weeks or later. It may be associated with divarication of recti. Most of these disappear spontaneously by 6 months to one year.

- Application of coin and bandage over the hernia is not recommended, as it may further weaken the anterior abdominal wall.

- If there are any associated conditions like increase intra abdominal pressure like excessive crying, constipation, persistent cough, etc to be **identified and managed appropriately.**

Danger signs of newborn

- Poor sucking/not sucking
- Lethargy
- Fever / hypothermia
- Fast breathing
- Abnormal body movements
- Vomiting
- Severe umbilical infection
- Abdominal distension
- Jaundice reaching palms & soles
- Swollen eyelid with pus discharge
- Extensive pustules or skin infection

Protection from infection

- Avoid taking baby to crowded indoor places.
- Avoid contact with someone with cold, cough and active infection.
- Not to kiss the baby on face.
- Encourage anyone who comes in contact with baby to wash his hands.

Do's	Don'ts
✓ Hand hygiene	❖ Kajal in eyes
✓ Baby and mother roomed in practices	❖ Prelacteal feeds
✓ Avoid visitors	❖ Application on cord
✓ General cleanliness	❖ Oil in nose and ears
✓ Room should be free from draught, wind, pollution	❖ Use of pacifier
✓ Tender loving care	❖ Unhygenic bathing water
	❖ Opium and brandy to baby

Developmental milestone

AGE	GROSS MOTOR	FINE MOTOR	LANGUAGE	COGNITIVE
2 MONTHS	Lifts head/chest when prone!	Eyes track past the midline	Alerts to sound Social (reciprocal) smile	Recognizes parent
4 MONTHS	Rolls front to back	Graps a rattle	Laughs Soothed by parent's voice	Orients head to direction of a voice
6 MONTHS	Sits with little or no support	Reaches with one hand Transfers objects	Babbles Developing stranger anxiety	Feeds self
9 MONTHS	Pullls to stand	Developing immature pincer grasp Bangs two objects Together	Says "mama/dada" Indiscriminately Waves bye-bye	Plays gesture game
12 MONTHS	Stands/walks alone	Fine pincer grasp	One word other than "mama"/"dada" Follows one-step commands with a gesture	Points to desired object

Some programme related to newborn

Navjat Shishu Suraksha Karykram (NSSK)

Launched on September 15, 2009

Focuses on:

- ✓Prevention of Hypothermia
- ✓Prevention of Infection
- ✓Early initiation of Breast feeding
- ✓Basic Newborn Resuscitation
- ✓Objectives: To train healthcare providers at DH, CHCs and PHCs

MAA (Mothers' Absolute Affection)

- A nationwide programme
- Implemented across states/UTs, from August 2016
- Aim of this programme, to improve the-breastfeeding and appropriate child feeding practices in the country through health system.

Home based new born care

- Care for every newborn by ASHA
- Visits in the first 6 weeks of life.
- Information and skill to the mother
- Examination of every newborn for prematurity
- Extra home visits for preterm and LBW babies
- Early identification of illness
- Follow up of sick newborns after they are discharged from facilities

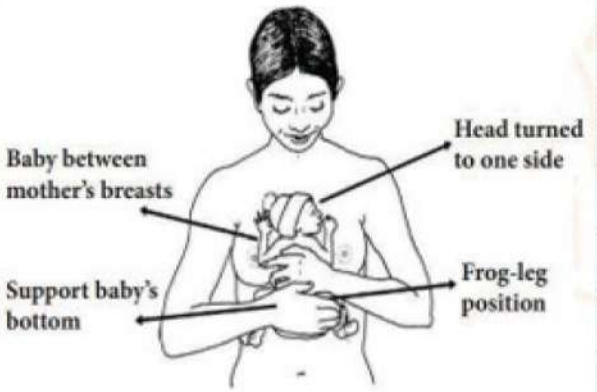
KMC (KANGAROO MOTHER CARE)

1. KMC is techniques use to keep the LBW babies warm
2. The neonate is held in skin to skin contact with mother or any other adult care giver
3. KMC should be given to all LBW babies whenever and wherever possible and for as long as possible.

KMC helps in -

1. Better thermal protection of neonates
2. Increase milk production
3. Increase exclusive mother breast feeding rate.
4. Reduce respiratory tract infection and nosocomial infections
5. Improve weight, length and head circumference of the baby
6. Improve emotional bonding.
7. Promote cardio-respiratory stabilization.
8. Shortens hospital stays
9. Reduce maternal stress level
10. Better development of Senses of babies like –
    Eye Sight
    Smell
    Auditory
    Vestibular (Balance Sense)
    Touch and Taste
11. Regular respiratory movement of mother prevent the occurrence of apnea of prematurity.

Mother providing KMC

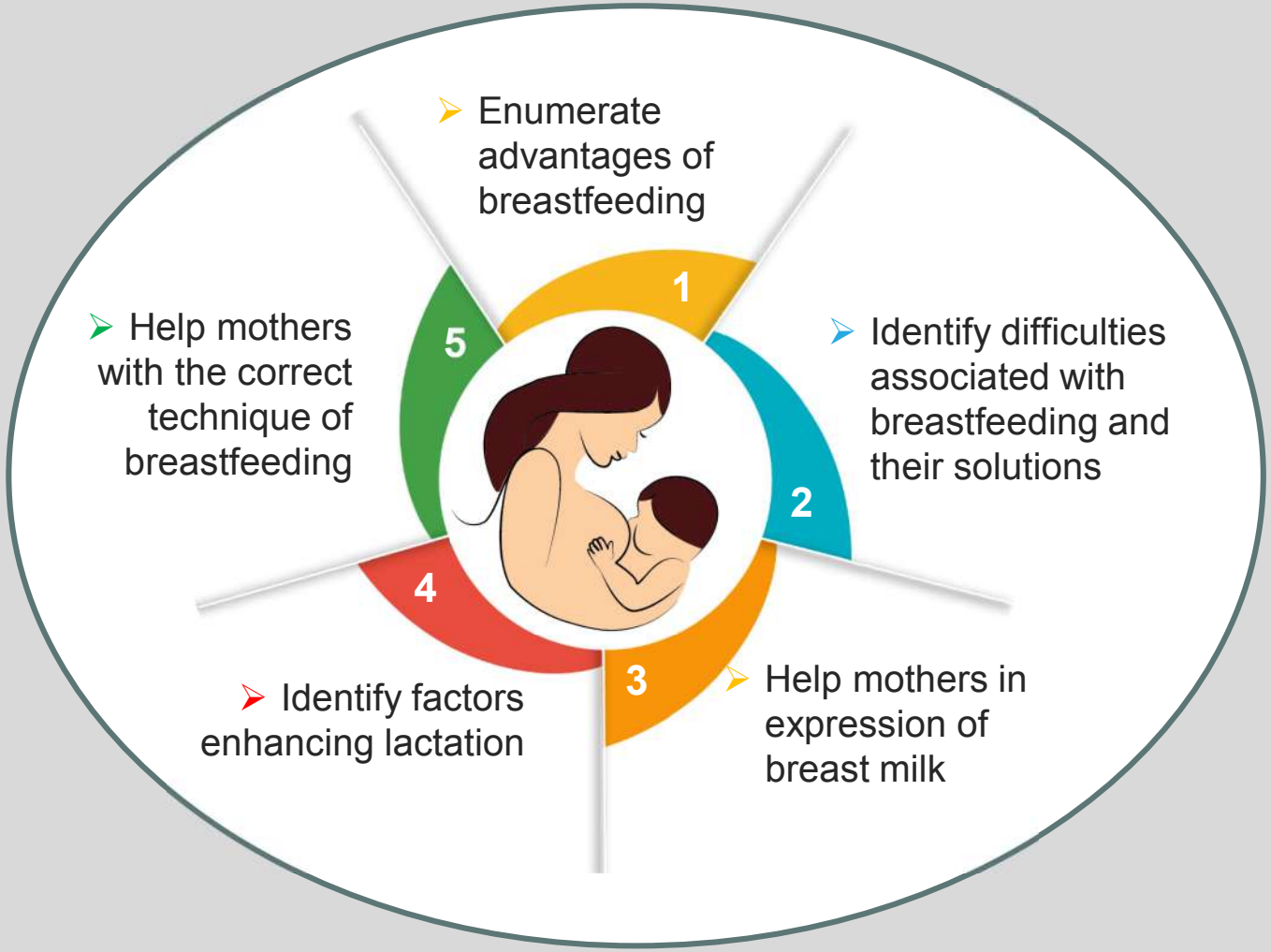


KMC Position

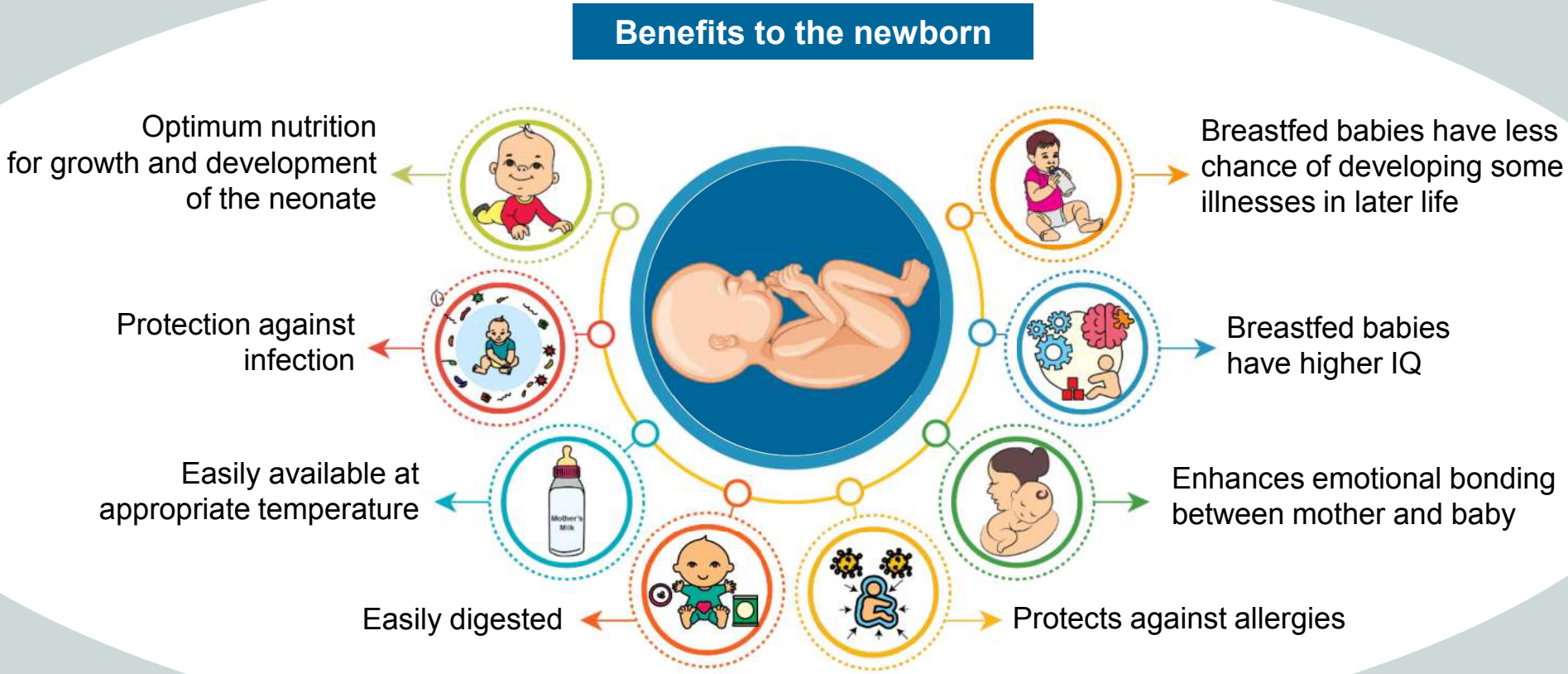
Cap, Jhabala, Diaper and Socks

BREASTFEEDING

Learning objectives



Advantages of breastfeeding



Advantages of breastfeeding cont…

Benefits to the mother

1. It accelerates the process of involution of uterus, reducing chances of postpartum haemorrhage
2. Breastfeeding has contraceptive effect for the mother
3. It lowers the risk of breast and ovarian cancer in the mother
4. It reduces her work load

Advantages of breastfeeding cont…

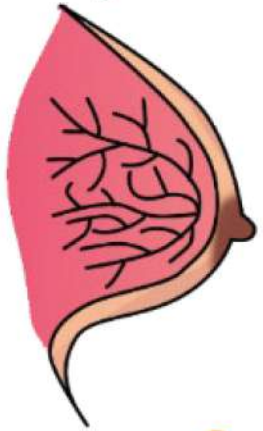
Benefits to the family and society

- Breastfeeding is more economical than artificial feeding
- It promotes family planning
- As it decreases the risk of infection in infants, it reduces the need of hospitalization
- It contributes to reduction in infant mortality and morbidity

Benefits of colostrum

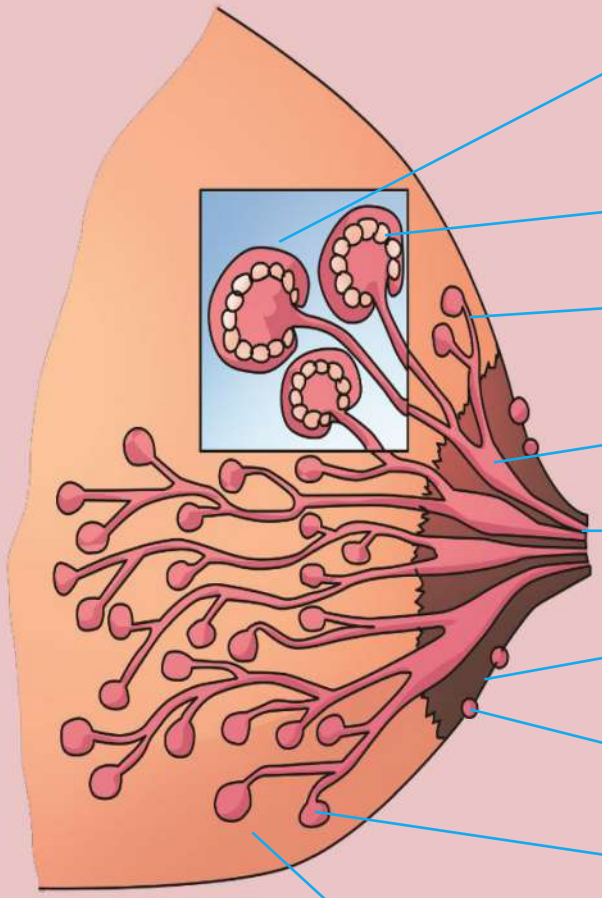
- It is thick and yellowish in colour
- Colostrum contains more protein
- It contains more antibodies, white blood cells and other anti-infective proteins, it acts like first immunization to the baby
- It has a mild purgative effect, which helps to clear the baby's gut of meconium
- It clears bilirubin from the gut and helps to prevent hyperbilirubinemia

Anatomy of breast



1. The breast consists of partly glandular tissue and partly supporting tissue and fat.
2. Milk is secreted by the gland and travels through tubules called ducts which drain into lactiferous sinuses. These ducts open outside at the nipple area.
3. Lactiferous sinuses, which store small quantities of milk lies beneath areola.
4. The glands are surrounded by myoepithelial tissue which helps in pushing the milk toward nipple.

Anatomy of breast



Muscle cells { Oxytocin makes them contract

Milk secreting cells { Prolactin makes them secrete milk

Ducts

Lactiferous sinuses { Milk collects here

Nipple

Areola {brown area behind nipple}

Montgomary's glands

Alveoli

Supporting tissue and fat

Prolactin Reflex

Prolactin is a hormone secreted from the anterior pituitary gland and is responsible for milk production.

When the baby sucks, the stimulation of the nipple and areola sends sensory impulses to the hypothalamus. This results in the secretion of prolactin.

Prolactin Reflex

Sensory impulses from nipples

Prolactin in blood

Baby suckling

- More prolactin secreted at night
- Suppresses ovulation

Secreted after feed to product next feed

Prolactin Reflex

Hindering factors

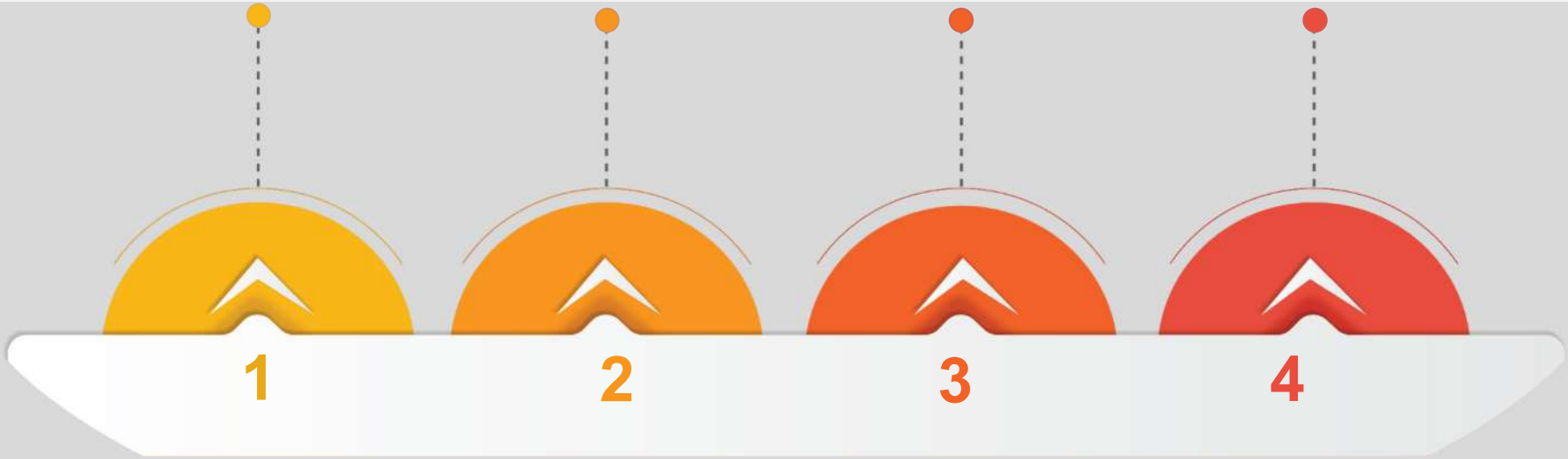
- Emptying of breast
- Suckling
- Expression of milk
- Night feeds

Enhancing factors

- Prelacteals
- Feeds with bottle
- Incorrect positioning
- Painful breast conditions

Oxytocin Reflex

1. Oxytocin is the hormone secreted by the posterior pituitary gland.
2. It is responsible for ejection of milk from the breast.
3. This oxytocin reflex is most sensitive to disturbances
4. Oxytocin secretion is increased by sensory impulses from the breast when the baby is suckling.



Oxytocin Reflex

Thinks lovingly
of baby
Sound of baby
Sight of baby
CONFIDENCE

Post pitutary

Increase oxytocin

Worry stress Pain
Doubt

Decrease oxytocin

Oxytocin in blood

Baby Sucking

Causes efection
of milk to baby

Oxytocin Reflex

Enhancing factors

- Thinking lovingly of the baby.
- Confidence
- Sound, sight, smell and touch of baby
- Back massage

Hindering factors

- Worry or stress
- Doubt
- Embarrassment
- pain

Reflexes in the baby

Rooting reflex

- When the mother holds her baby her breast or nipple touches the baby's lip or cheek, the baby opens his mouth and may turn head to find it. He puts his tongue down and forward. This is called rooting reflex.

- It helps the baby to find the nipple and in proper attachment to the breast.

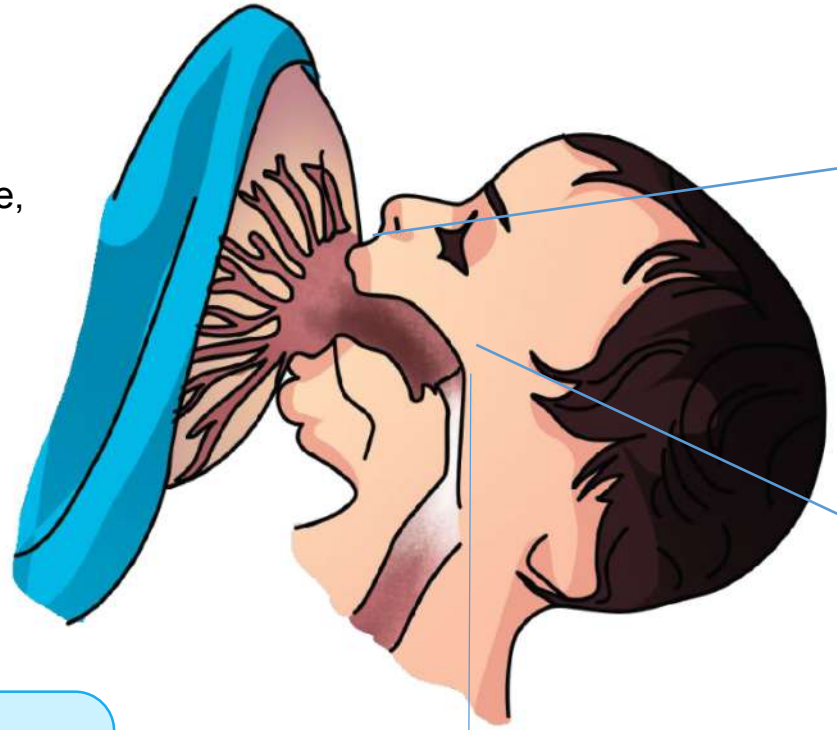
Reflexes in the baby

Sucking reflex

When something touches a baby's palate, he starts to suck it

Swallowing reflex

When the baby's mouth fills with milk, he swallows



Rooting reflex
When something touches lips, baby opens mouth puts tongue down and forward

Sucking reflex
When something touches palate, baby sucks

Swallowing reflex
When mouth fills with milk, baby swallows

Skill
Mother learns to position baby
Baby learns to take breast

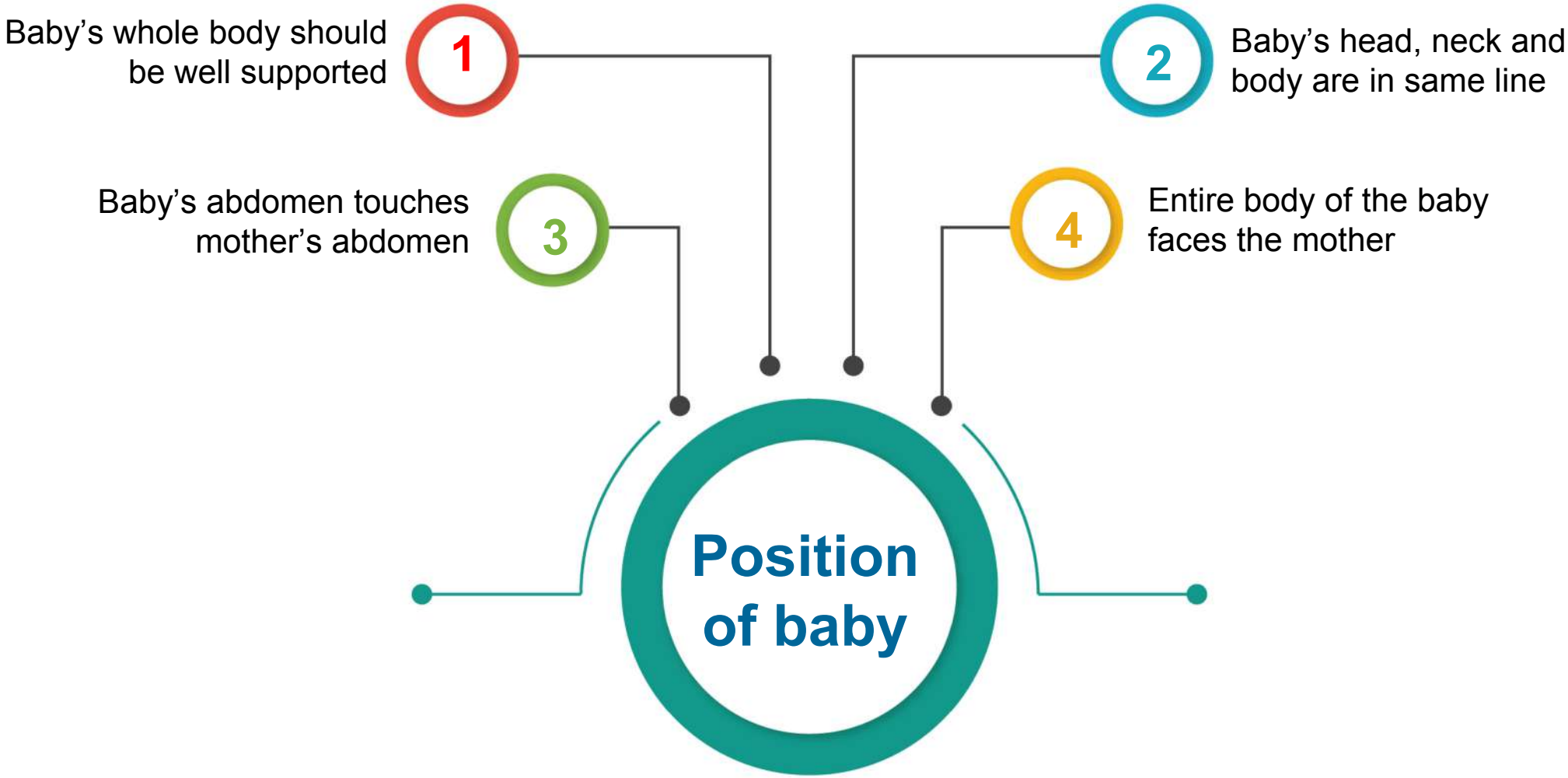
Technique of breastfeeding

Positioning

Position of mother

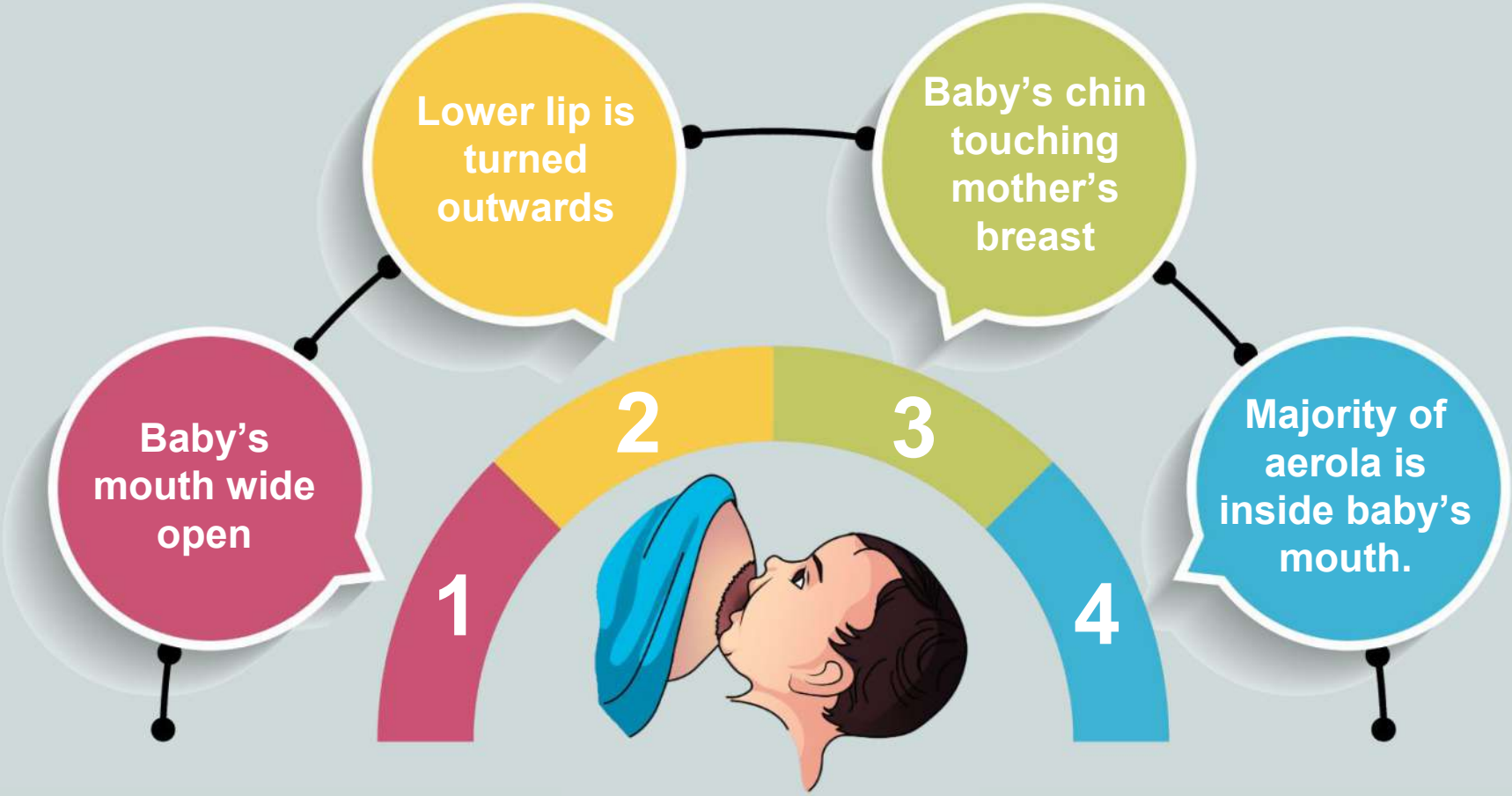
- The mother can take any position that is comfortable to her and her baby.
- Her back should be well supported and she should not be leaning on her baby
- The important principle to remember is bring the baby to the breast, not the breast to the baby

Technique of breastfeeding

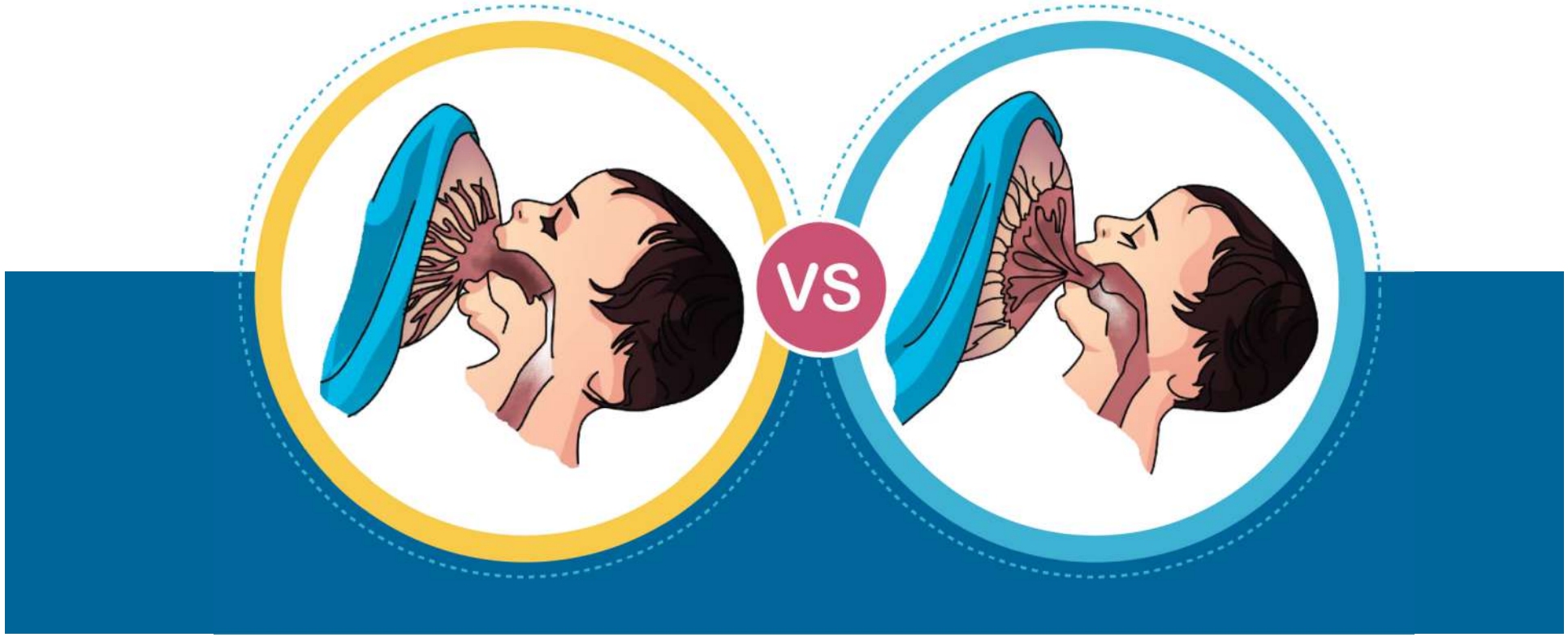


Good attachment

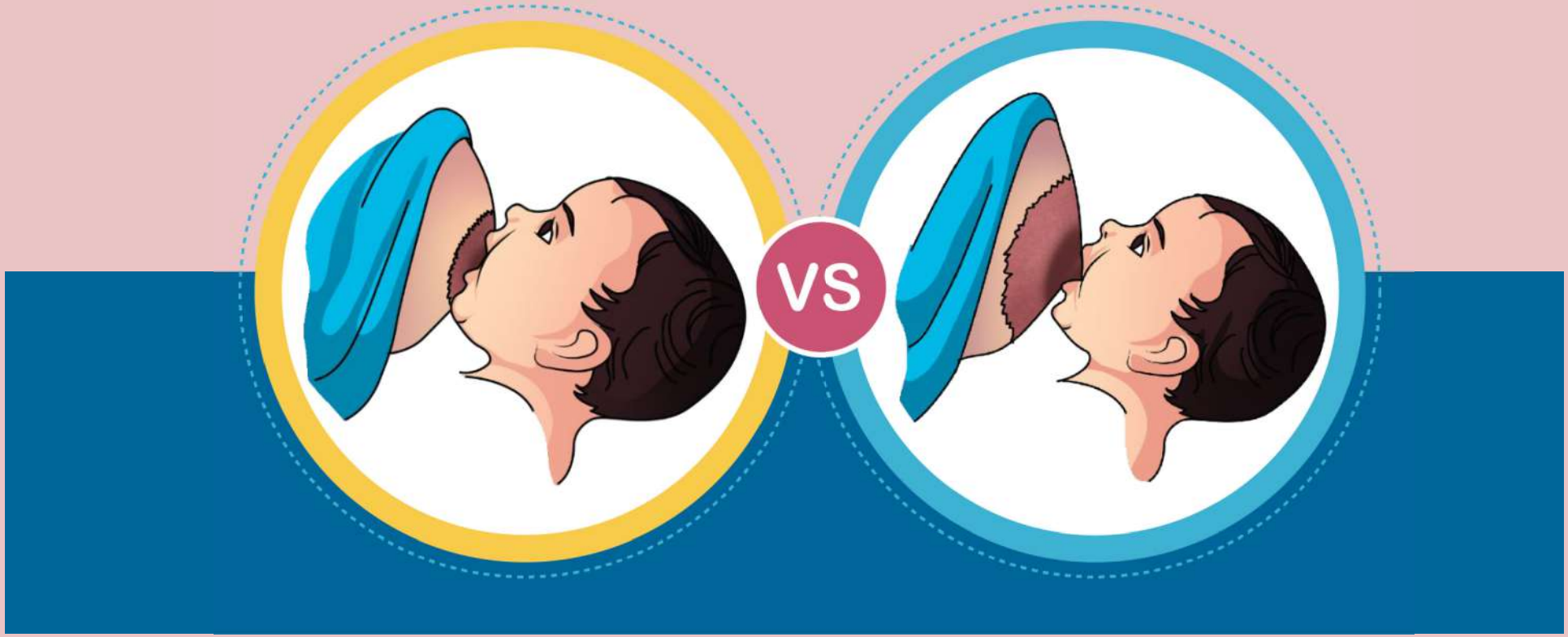
Four signs of good attachment are



Good attachment vs poor attachment



Good attachment vs poor attachment



Practices for successful breastfeeding

01 Early initiation of breastfeeding should be done within half hour of delivery.

02 No prelacteal feed should be given to the infant.

03 The infant should be fed on demand, as frequently and as long as she wants.

04 Both day and night feeds should be given. Complete emptying of breast should be done.

05 Exclusive breastfeeding for 6 months

06 Adequacy of breastfeeding may be ascertained by documenting weight (20-30 g/day), and urine output (6-8 times/day).

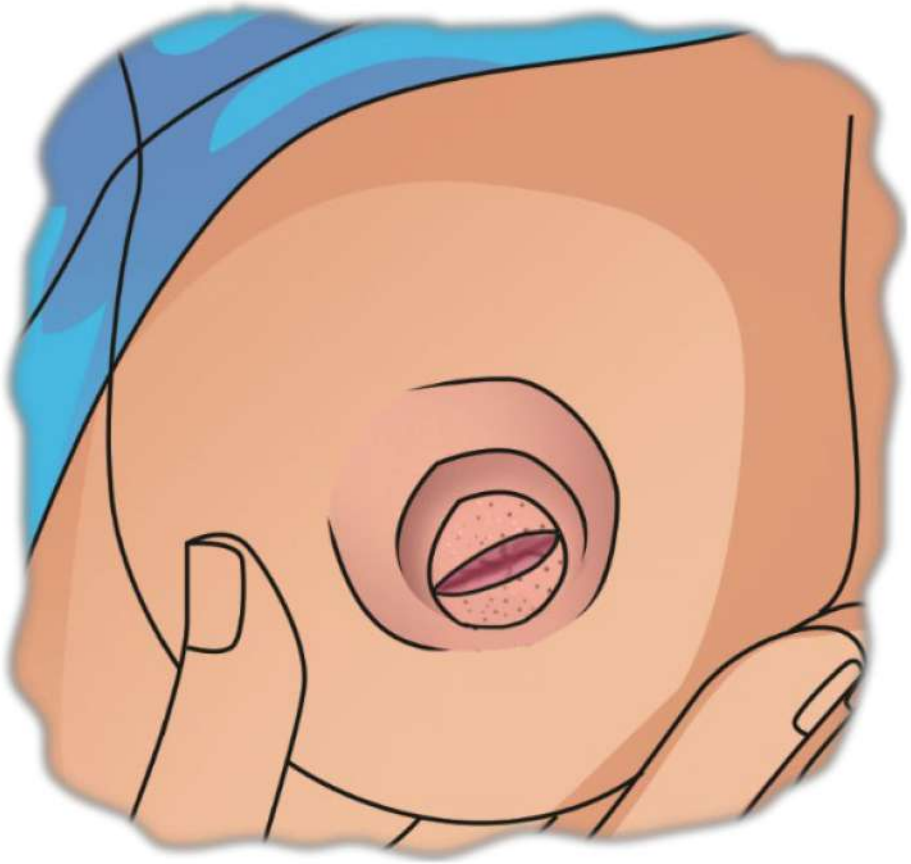
Common problems during breastfeeding

1. Sore nipple and cracked nipple
2. Breast engorgement
3. Blocked duct, mastitis and breast abscess
4. Flat nipple, inverted nipple
5. Not enough milk, baby crying too much

Sore and cracked nipples

Causes

- The most common cause of sore nipples is poor attachment. The baby suckle only at the nipple.
- Frequently washing the breasts with soap and water
- Pulling the baby off the breast while he is still sucking



Treatment

- Correct positioning and attachment
- Hindmilk should be applied on the nipple after feeding.
- If fungal infection suspected treat with antifungal cream

Breast engorgement

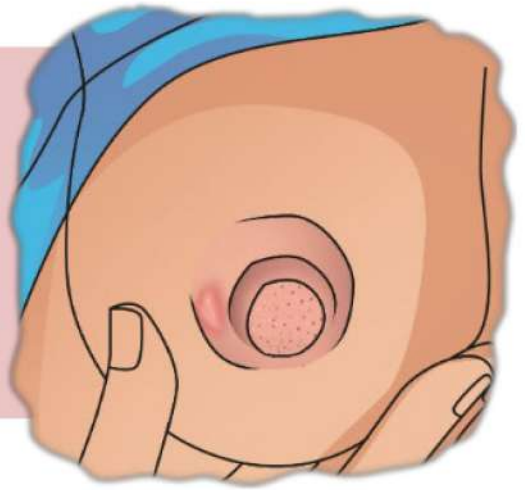
- If breasts are not emptied, the milk gets collected in the breast leading to engorgement.
- The engorged breast is tight, shiny, warm and painful.
- The factors which cause engorgement of breast
  - Delayed initiation of breastfeeds
  - Long intervals between feeds, incomplete emptying
  - Poor positioning and attachment

Treatment

- Frequent breastfeeding with correct attachment.
- Expressed milk can also be given to the infant with cup/spoon.
- Applying warm packs and analgesics

Breast abscess

- If an engorged breast, an infected cracked nipple or mastitis are not treated in the early stages an infected breast segment may form a breast abscess

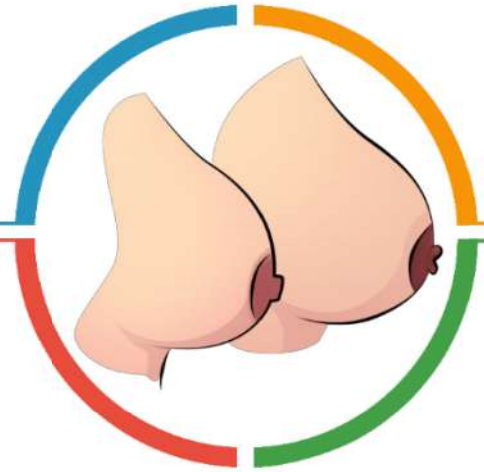


Treatment

1. Antibiotic, analgesic and warm packs to the breast should be given
2. Incision and drainage should be done
3. If necessary expression of breast milk should be done
4. Breastfeeding must be continued from the other breast

Inverted/ flat nipple

Flat or short nipple protract well and do not cause difficulty in breastfeeding



Should be diagnosed in the antenatal period

But inverted or retracted nipple can’t be pulled out easily

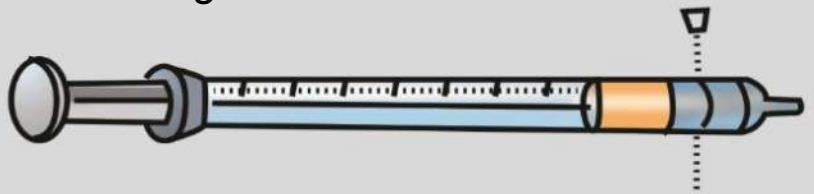
Mothers need additional support to feed their babies

Treatment of inverted nipple

- Treatment is started after birth of the baby
- Nipple is manually stretched and rolled out several times a day

STEP ONE

Cut along this line with blance

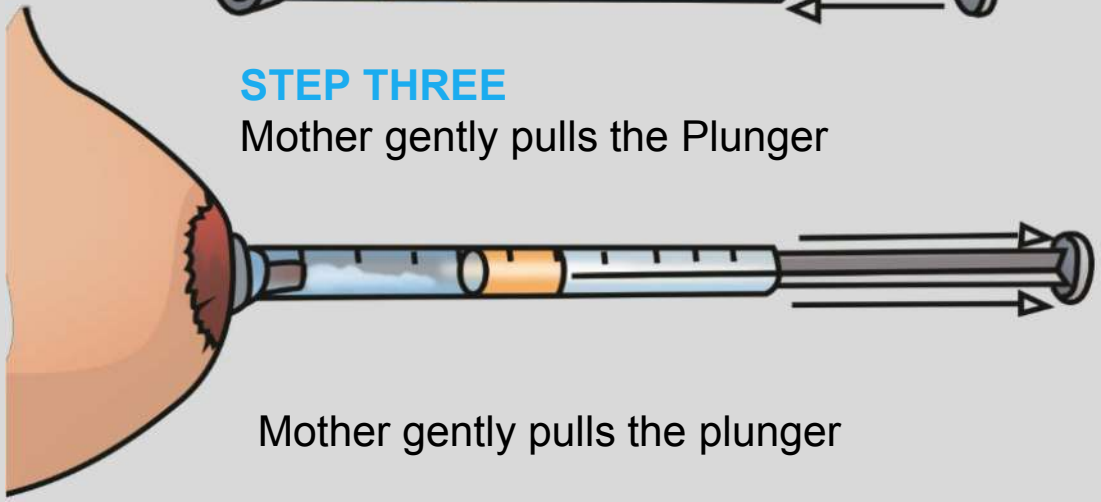


STEP TWO

Insert Plunger from Cut End

STEP THREE

Mother gently pulls the Plunger



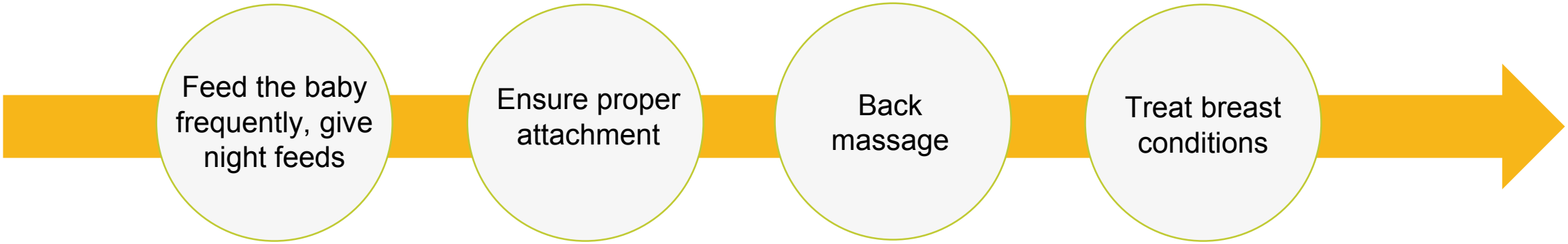
Mother gently pulls the plunger

Not enough milk

- Reassurance is needed if baby is gaining weight adequately, passing urine 6-8 times /day and sleeps 2-3 hours after each feed.
- Common causes

  - Not breastfeeding often enough
  - Too short breastfeeds
  - Poor attachment
  - Breast engorgement

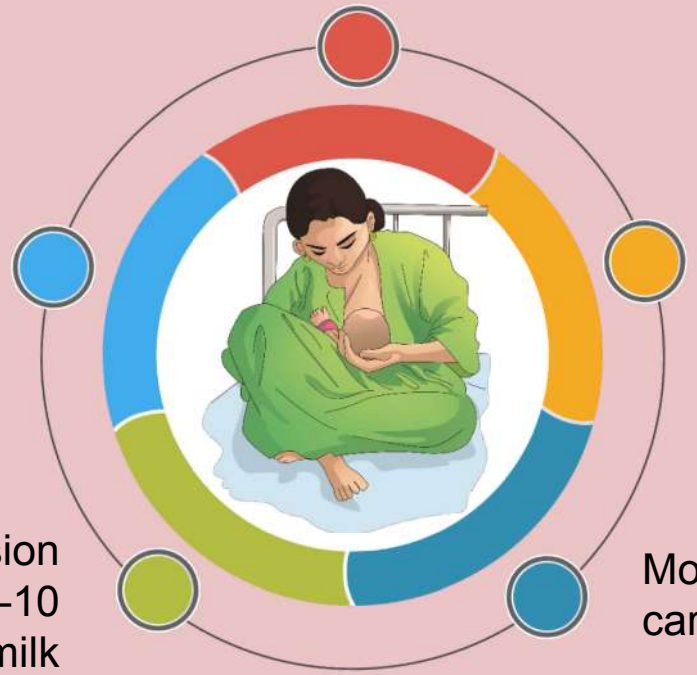
Treatment



Breastfeeding in preterm and lbw babies

The ability of the baby to breastfeed depends on the coordination of suck, swallow and breathing

This coordination develops at 32-35 weeks

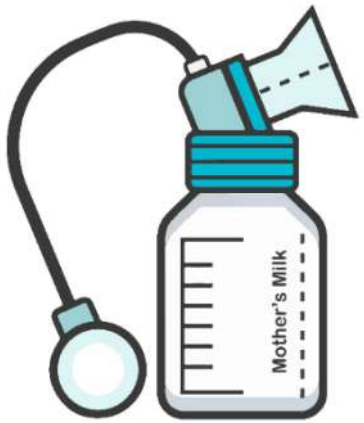


The baby should be put to breast every 2-3 hrs for feeding or non nutritive sucking

Mother should begin milk expression as early as possible and repeat 8-10 times per day to maintain milk production and feed the baby

Mother should visit, touch and care the baby as often as possible

Breast milk expression



Expression of breast milk is required in the following situations

1. To maintain milk production and for feeding the baby who is premature, low birth weight or sick and cannot breast feed
2. Working mothers who plan to return to work
3. To relieve breast engorgement

Technique of breast milk expression

The mother will

1. Wash hands with soap and water
2. Sit comfortably and hold a clean container near the breast
3. She will put the thumb on her breast above the nipple and areola and her first finger on the breast below the nipple and areola. She supports her breast with the other fingers
4. Press her thumb and first finger slightly inward towards the chest wall
5. Press her breast behind the nipple and areola between her forefinger and thumb
6. Press the areola in the same way from the sides

Storing expressed milk

Wash the container thoroughly with soap and water

EBM can be kept at room temperature for 8 hours and in refrigerator for 24 hours

Cover the container with clean lid

Comparison between cow, buffalo & human milk

Components	Cow (100 mL)	Buffalo (100 mL)	Human (100 mL)
Protein (g)	3.2	6.5	1.1
Fat (g)	4.1	4.3	3.4
Lactose (g)	4.4	5.1	7.4
Calcium (mg)	120	210	28
Energy (kcal)	67	117	65

Signs of Effective Breastfeeding

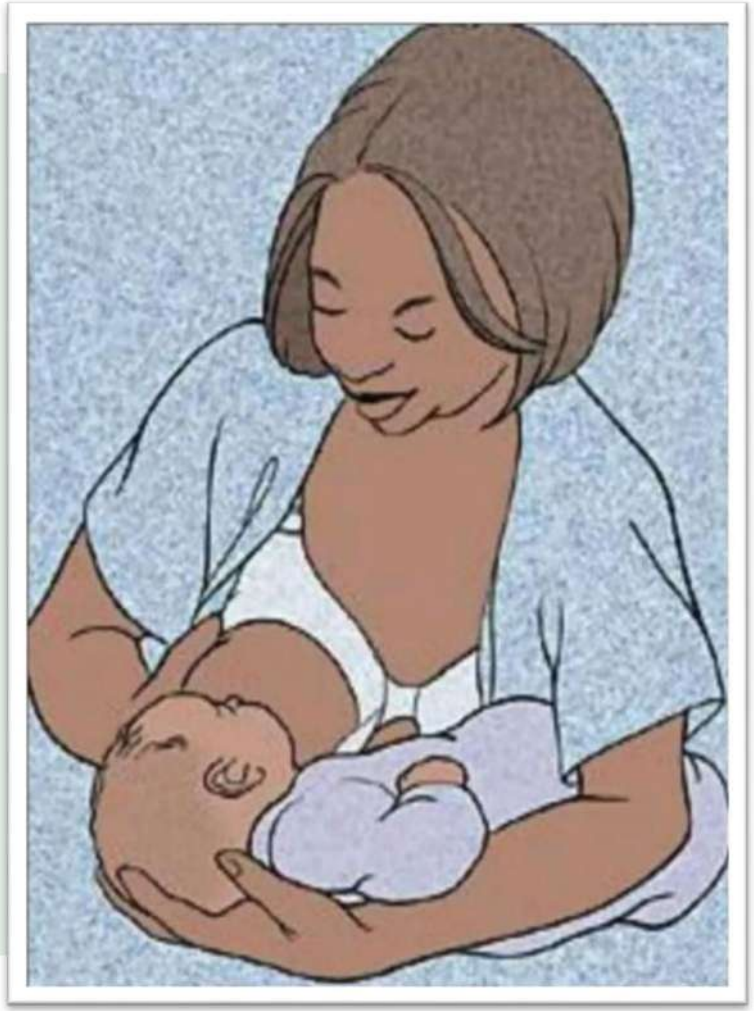
- Frequent feedings 8-12 times daily.
- Intermittent episodes of rhythmic sucking with audible swallows should be heard while the infant is nursing.
- Infant should have about 6-8 wet diapers in a 24 hour period once breast feeding is established.
- Infant should have minimum of 3-4 bowel movements every 24 hours.
- Stools should be about one tablespoon or larger and should be soft andcyellow after day 3.
- Average daily weight gain of 15-30g.
- Infant has regained birth weight by day 10 of life.

PROPER POSITIONING

Breastfeeding Positions

Cross Cradle Hold Position

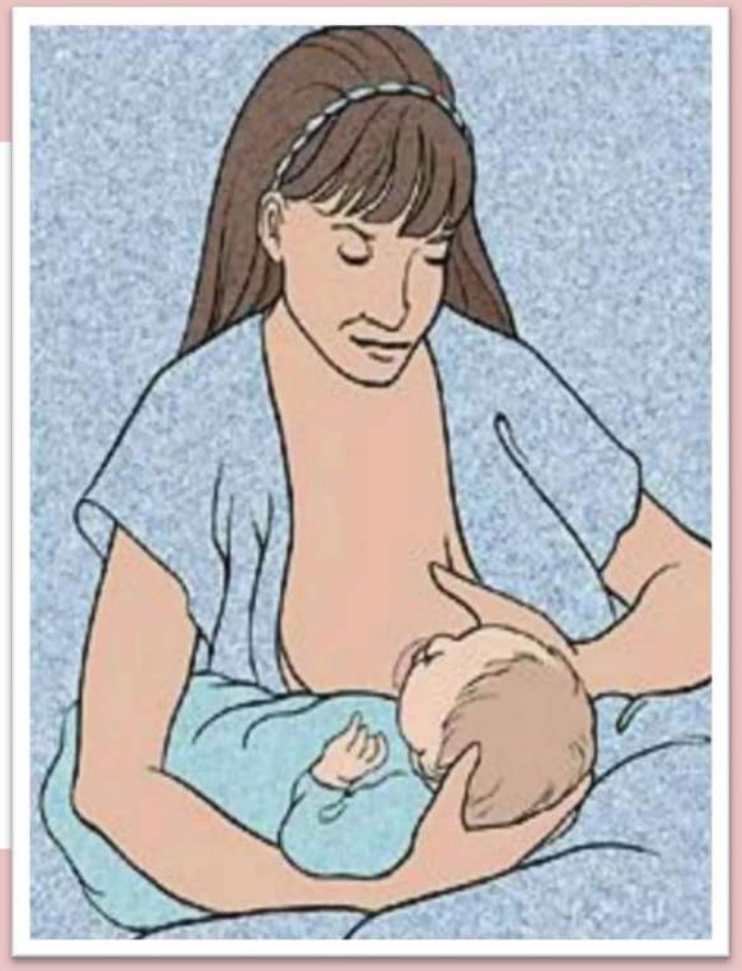
- Ideal for early breastfeeding.
- Mother holds the baby crosswise in the crook of the arm opposite the breast the infant is to be fed.
- ·The baby's trunk and head are supported with the forearm and palm.
- ·The other handisplaced beneath
- the breast in a U-shaped to guide th baby's mouth to your breast.



Breastfeeding Positions

Football Hold Position

- The infant's is placed under the arm, like holding a football.
- Baby's body is supported with the forearm and the head is supported with the hand.
- Many mothers are not comfortable with this position.
- Good position after operative procedures.



Breastfeeding Positions

Cradle Hold

- This is the most common position used by mothers.
- Infant's head is supported in the elbow, the back and buttock is supported by the arm and lifted to the breast.

Breastfeeding Positions

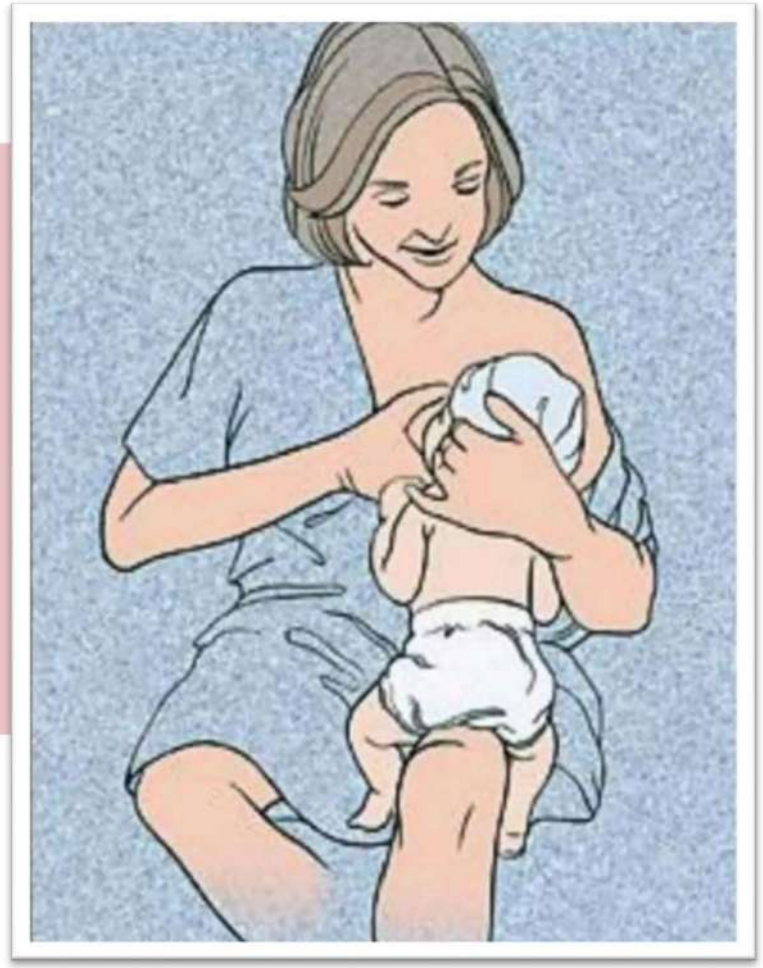
Side Lying Position

- The mother lies on her side propping up her head and shoulder with pillows.
- The infant is also lying down facing the mother.
- Good position after Caesarean section.
- Allows the new mother some rest.
- Most mothers are scared of crushing the baby.

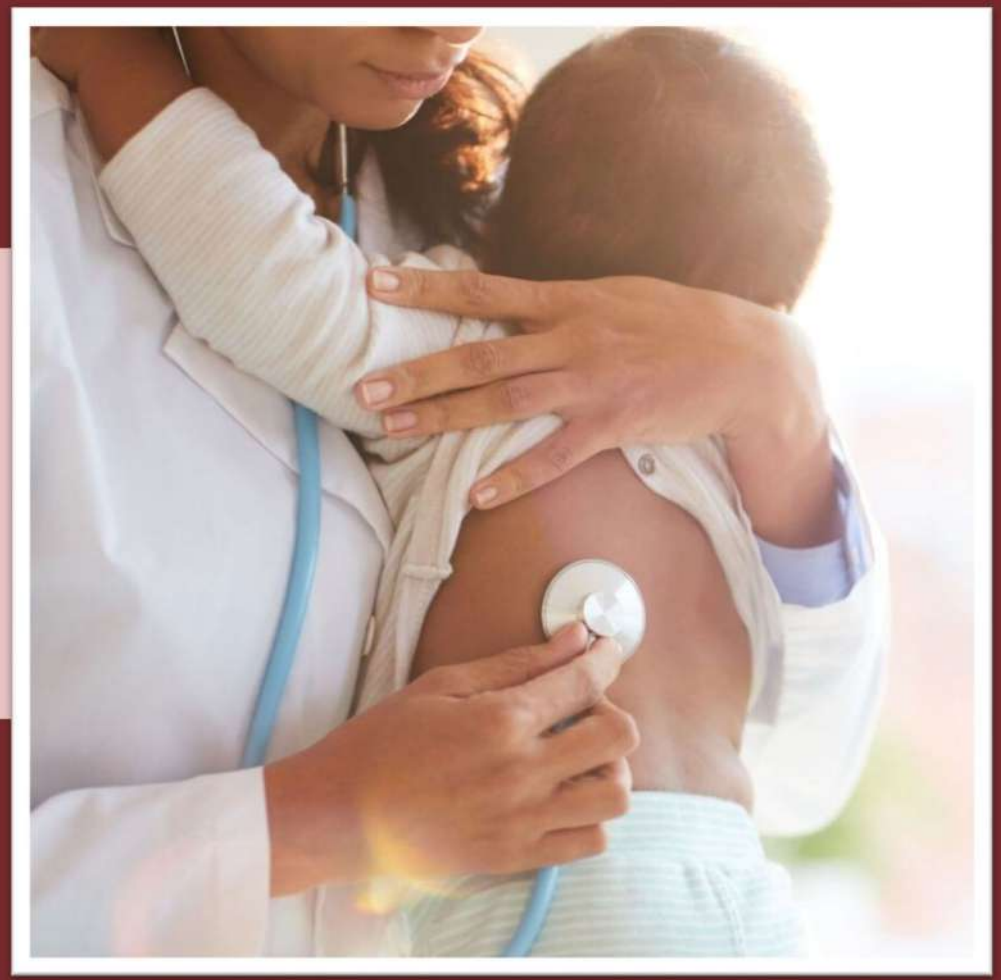
Breastfeeding Positions

Australian Hold Position

- This is also called the saddle hold.
- Usually used for older infants.
- Not commonly used by mothers.
- Best used in older infants with runny nose, ear infection.



Respiratory Illnesses and Management Among Children



Differential diagnosis in a child presenting with stridor	
Diagnosis	***In favour***
Viral Croup	• Barking cough • Respiratory distress • Hoarse voice
Diphtheria	• Bull neck appearance due to enlarged cervical nodes and oedema • Congested throat • Grey pharyngeal membrane • Blood-stained nasal discharge • Incomplete vaccination /No evidence of DPT vaccination
Retropharyngeal abscess	• Soft tissue swelling in posterior pharyngeal wall • Difficulty in swallowing • Fever • Toxic look
Foreign body	• Sudden history of choking • Respiratory distress
Epiglottitis	• Soft stridor • Toxic look • Little or no cough • Drooling of saliva • Inability to drink
Laryngomalacia	• Stridor starting during first month
Anaphylaxis	• History of allergen exposure • Wheeze • Shock • Urticaria and oedema of lips and face

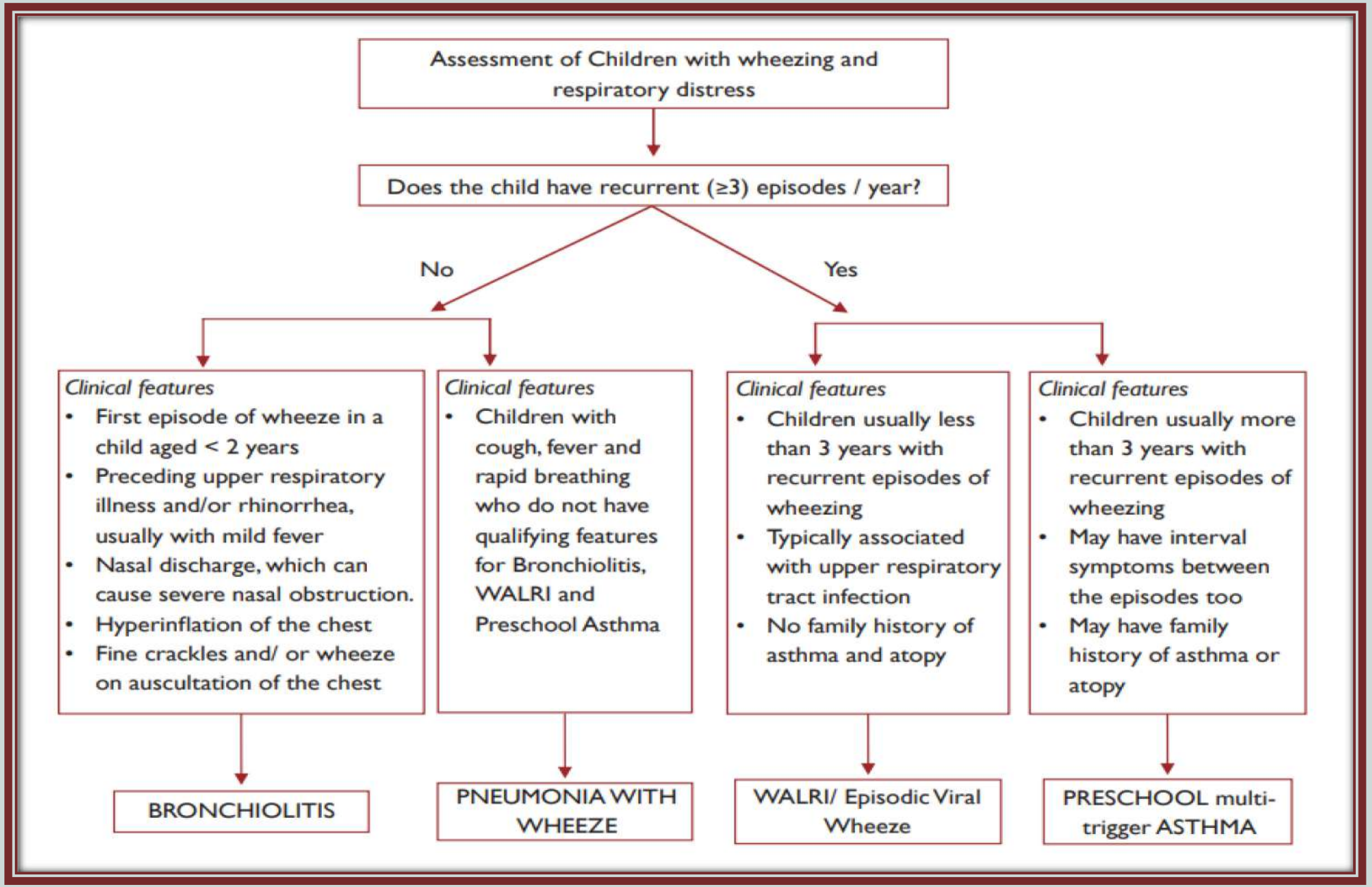

Assessment of Children with wheezing and respiratory distress
Does the child have recurrent (≥3) episodes / year?
No
Yes
Clinical features
First episode of wheeze in a child aged < 2 years
Preceding upper respiratory illness and/or rhinorrhea, usually with mild fever
Nasal discharge, which can cause severe nasal obstruction.
Hyperinflation of the chest
Fine crackles and/ or wheeze on auscultation of the chest
BRONCHIOLITIS
Clinical features
Children with cough, fever and rapid breathing who do not have qualifying features for Bronchiolitis, WALRI and Preschool Asthma
PNEUMONIA WITH WHEEZE
Clinical features
Children usually less than 3 years with recurrent episodes of wheezing
Typically associated with upper respiratory tract infection
No family history of asthma and atopy
WALRI/ Episodic Viral Wheeze
Clinical features
Children usually more than 3 years with recurrent episodes of wheezing
May have interval symptoms between the episodes too
May have family history of asthma or atopy
PRESCHOOL multi-trigger ASTHMA

Chart 3.9: Differential diagnosis in children presenting with chronic cough

Diagnosis	*In favour*
TB	• Weight loss (>5% loss in last 3 months) • Anorexia • Enlarged liver and spleen • Persistent or intermittent fever • History of contact with tuberculosis case • Abnormal chest X-ray
Asthma	• History of recurrent wheeze • Hyperinflation of the chest • Prolonged expiration • Reduced air entry (in very severe airway obstruction) • Good response to bronchodilators
Pertussis	• Paroxysms of cough followed by whoop, vomiting, cyanosis or apnoea • Sub-conjunctival haemorrhages • Not received DPT vaccination. • No fever
HIV	• Known or suspected maternal or sibling HIV infection • Failure to thrive • Oral or oesophageal thrush • Chronic parotitis • Skin infection with herpes zoster (past or present) • Generalized lymphadenopathy • Chronic fever • Persistent diarrhoea • Finger clubbing

Differentiation : Viral & Bacterial infection

Viral Infection

- **High fever at onset,**
- Better by day **3 or 4**
- **Non toxic**
- **Inter febrile period normal**
- Disseminated (URI+LRI)
- **More than one system involved.**
- **More than one member** in the family are sick

Bacterial Infection

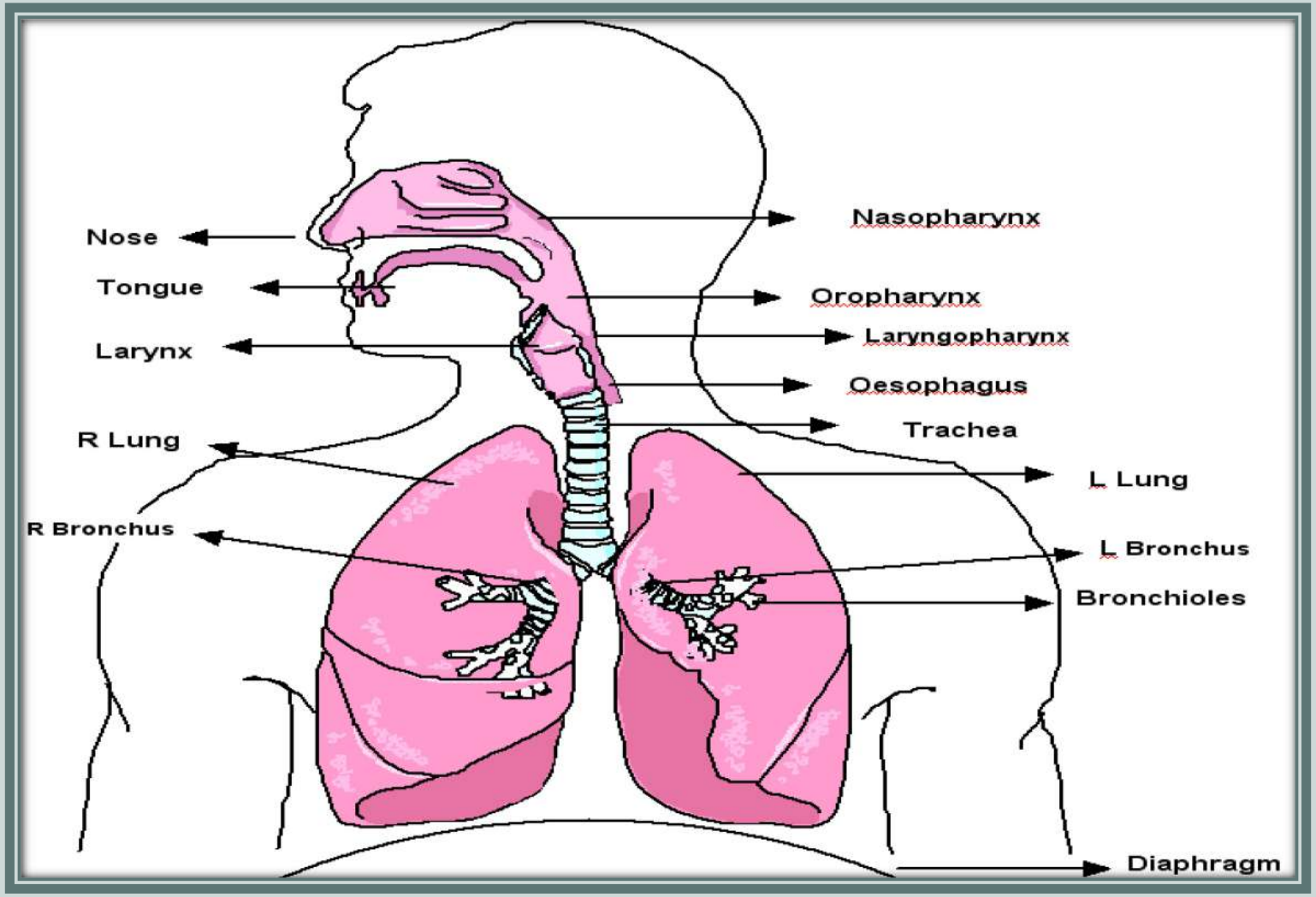
- **Moderate at onset, peaks on day 3 or 4**
- **Toxic**
- **Interfebrile period not normal**
- **Localized to one symptom or part of one system.**
- No sick contact.
- **Regional Lymphnode often enlarged**

Viral Vs Bacterial

FEATURES	VIRAL	BACTERIAL
Coryza	+++	+/-
Cough	Dry	Productive
Throat Exam	Enanthema	Exudates
Purulent Discharge	+	++
Systemic Disturbance	++	+/-
Wheeze	+++	+/-
CXR	Br. Pneumonia	Lobar, Pneumatocele

- Evidence of Large Para-pneumonic effusion,
- Abscess or Necrotizing Pneumonia is highly supportive of Bacterial Infection.

Anatomy and physiology of The Respiratory System



Respiratory Tract Disorders

Upper respiratory Tract Disorders

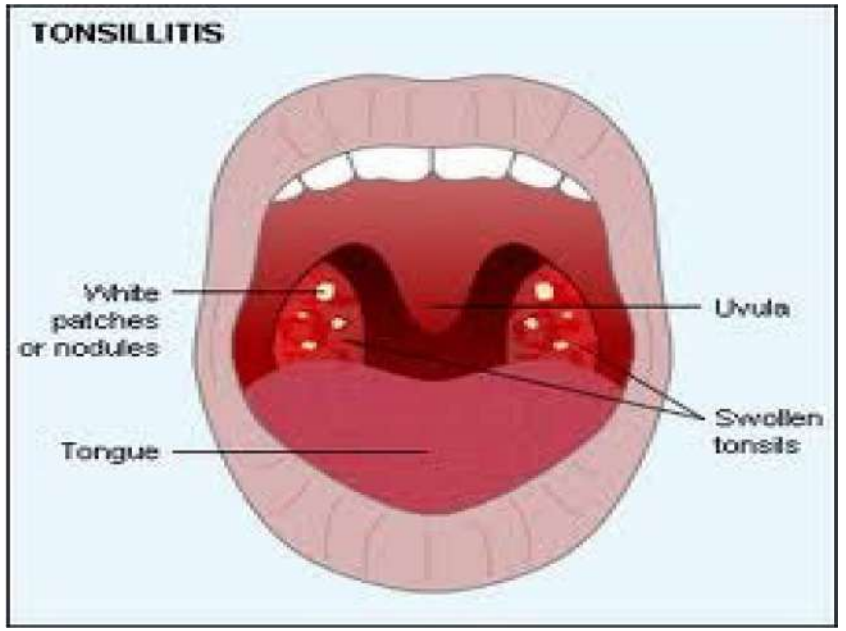
- Tonsillitis
- Epistaxis
- Aspiration
- Acute Otitis Media (AOM)
- **Pharyngitis**

Lower Respiratory Tract Disorders

- Broncheolitis
- Pneumonia
- Asthma

Tonsillitis

- Inflammation of the tonsils and especially the **palatine tonsils** typically due to viral or bacterial infection and marked by red enlarged tonsils usually with sore throat, fever, difficult swallowing, hoarseness or loss of voice, and tender or swollen lymph nodes



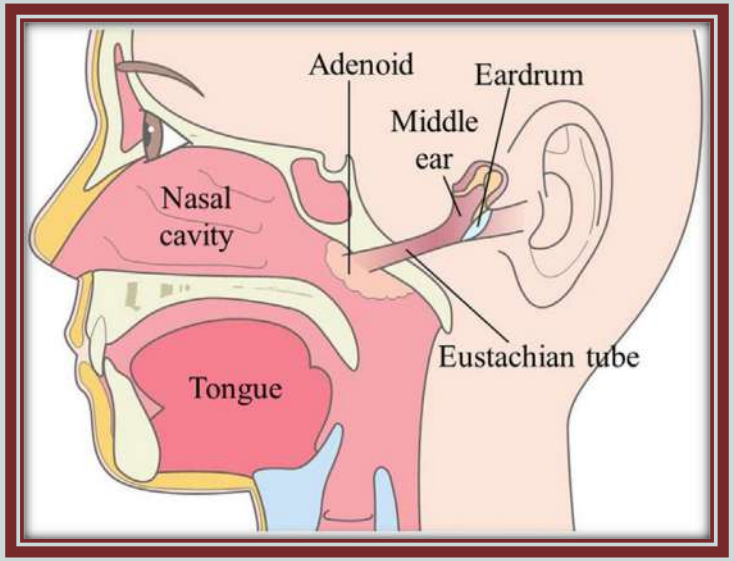
Etiology of tonsilitis

Viral infection - includes adenovirus, rhinovirus, influenza, coronavirus

Bacterial infection - Group A β-hemolytic streptococcus

Pathophysiology

- As with pharyngities, the cause may be viral or bacterial.
- As a result of inflammation, the tonsils, palatine or faucial, enlarge.
- They may meet in the midline and obstruct the passage of food and air.
- If the adenoids are also involved, they may block the posterior nares, resulting in mouth breathing.
- In addition, the Eustachian tubes may be blocked resulting in otitis media.



Clinical Manifestation

- Sore throat
- Red, swollen tonsils
- Pain when swallowing
- High temperature (fever)
- Coughing
- Headache
- Tiredness
- Chills
- A general sense of feeling unwell (malaise)
- White pus-filled spots on the tonsils
- Swollen lymph nodes (glands) in the neck
- Pain in the ears or neck

Cont……

Less common symptoms

- Nauseainclude:
- Stomach ache
- Vomiting
- Furry tongue
- Bad breath (halitosis)
- Voice changes
- Difficulty opening the mouth (trismus)

DIAGNOSIS

- The diagnosis of GABHS tonsillitis can be confirmed by culture of samples obtained by swabbing both tonsillar surfaces and the posterior pharyngeal wall and plating them on sheep blood agar medium.
- The isolation rate can be increased by incubating the cultures under anaerobic conditions and using selective growth media. A single throat culture has a sensitivity of 90%-95% for the detection of GABHS

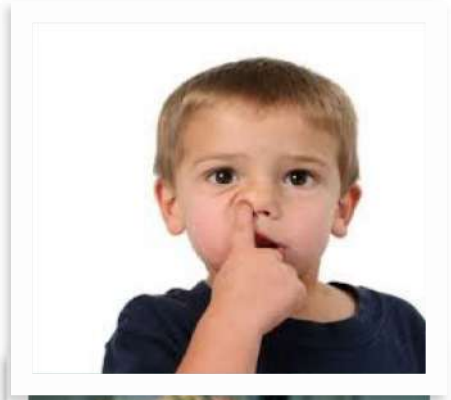
Management

- Warm saline gargles, throat lozenges and analgesics can relieve discomfort and congestion.
- Nutrition can be supplied by feeding the children with a soft well cooked, and nonirritating diet.
- Antibiotics if needed, should be given as for the prescribed period
- If a surgery is needed, the children and parents should be prepared psychologically, for the operation.

Complication of tonsilitis

- Peritonsillar abscess.
- Parapharyngeal abscess.
- Intra tonsillar abscess.
- Tonsilloliths.
- Tonsillar cyst.

Epistaxis



Bleeding from the nose occurs frequently in children. Bleeding occurs usually from anterior-inferior portion of the cartilaginous nasal septum due to rich capillary vasculature in this zone known as little's area or **kiesselbach's plexus**.

Etiology

Local factors

- Blunt trauma
- Foreign bodies
- Inflammatory reaction

Other possible factor

- Anatomical deformities
- Intranasal tumours
- Low relative humidity of inhaled air
- Nasal cannula O_2

Pathophysiology

- Epistaxis is caused by external trauma, foreign bodies, forcible blowing of the nose or picking the nose.
- Allergic rhinitis or sinusitis may also lead to nosebleed.
- The strain of emotional excitement or physical exercise may be enough to start nasal bleeding.
- A circulatory, renal, or emotional condition that produces elevated blood pressure cause nasal haemorrhage. It may also result from rheumatic fever, a blood dyscrasia, or an infection.

Management

FIRST AID

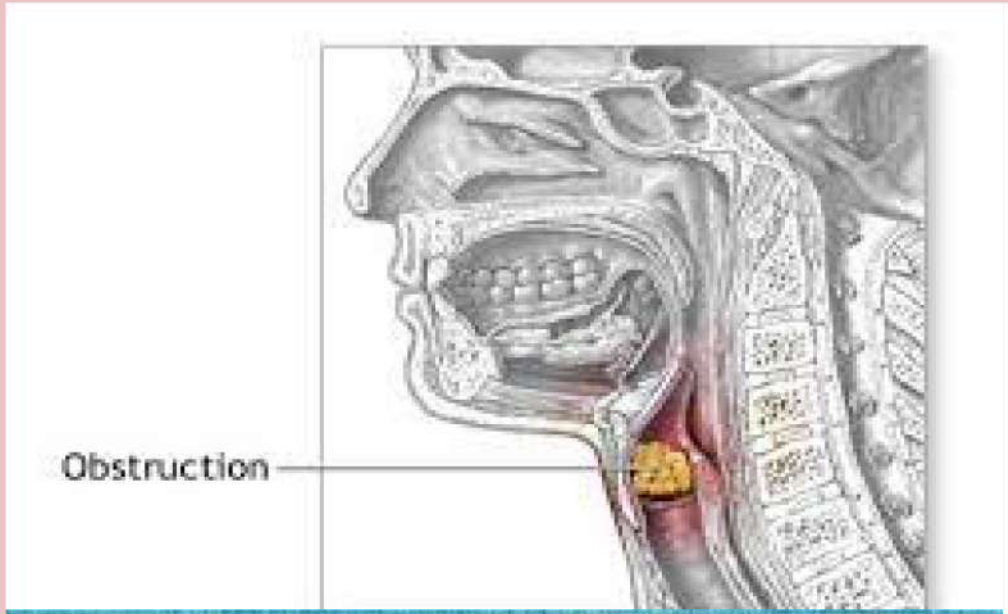
- Trotter's procedure
  Make the patient sit up, pinch nose, open mouth and breath.
- Ice or cold application on the bridges of the nose.
- Pinching the nose for a minute.

Nursing Management

- Details family history and history of illness to be obtained and necessary investigations to be performed.
- Blood transfusion may be necessary in some children with epistaxis
- Continues monitoring of vital signs, bleeding, hypoxia, respiratory difficulty and nasal packing.
- Teaching the parents and family members about measures to stop epistaxis and immediate medical help are also important.

Managements to be opt by parents

- Instructions to be given to the parents to apply lubricant to nasal septum twice daily to reduce dryness and to avoid nasal blowing or picking nose after nose bleed
- Preventive measures of foreign body in the nose, nasal injury and solar radiation to be explained.
- Need for management of local and systemic cause of epistaxis should be informed and emphasized.

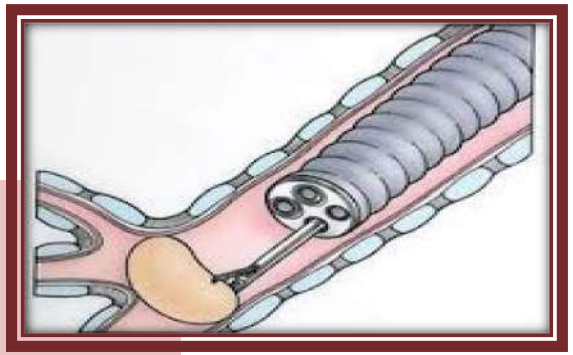

Obstruction


Foreign Body
ASPIRATION

Clinical Manifestation

- Choacking
- Gaging
- Strider
- Cyanosis

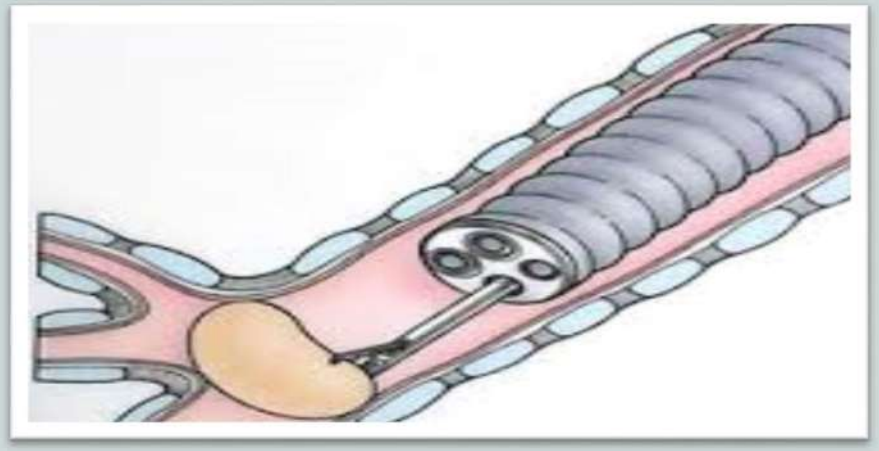
Treatment

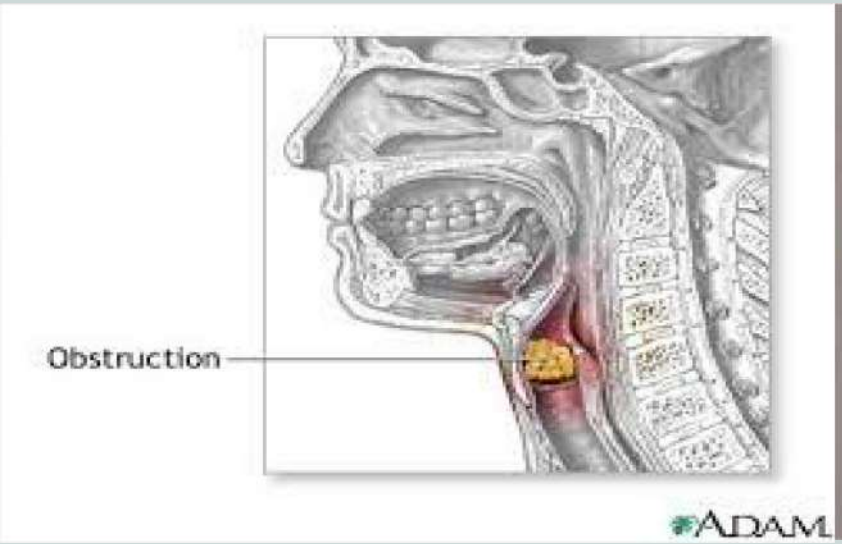


- Laryngoscopic or bronchoscopic removal of the foreign body may required. If lodged in the larynx, a tracheostomy may necessary to maintain the respiration, until further treatment is given.
- Antibiotics may be prescribed to prevent infection.
- Patients need observation for a further change in the signs

Nursing management

- Infants and children many times do not cough up aspirated foreign bodies, which should be there for be removed promptly under direct vision by laryngoscopy or bronchoscopy.





Treatment Continue….

- Prompt removal prevents local tissue inflammation, which makes later removel more difficult. If, for instance, a vegetal foreign body such as a portion of a peanut remains in a bronchus, the peanut swells, hampering removal and sometime necessitating **a lobactomy**.
- If complication such as secondary infections occurs, they should be treated with appropriate antibiotics.

Prevention

- Provide only sturdy, well constructed rattles for infants.
- Provide only pacifiers that have a one piece, durable construction
- Remove small parts that could be aspirated or swallowed from toys.
- Remove diaper or safety pins, buttons, small whole or broken parts of toys, and other small objects from areas where infant can reach
- Do not permit infants to play with balloons.
- Remove small objects from the floor before the infant is placed there and from the crib when the infant is sleeping.
- Do not give the infants nuts, lozenges, other hard candies, fruits that contain pits or seeds.

Heimlich Maneuver in Children

Acute Otitis Media

Acute Otitis Media (AOM)

- Acute illness with fluid and mucosal inflammation of the middle ear space
- Extremely common in young children: By age 3, two-thirds have had at least one episode
- Much less common in adults
- Increased risk with some ethnic groups, exposure to polluted air (including tobacco smoke), and with children who attend daycare

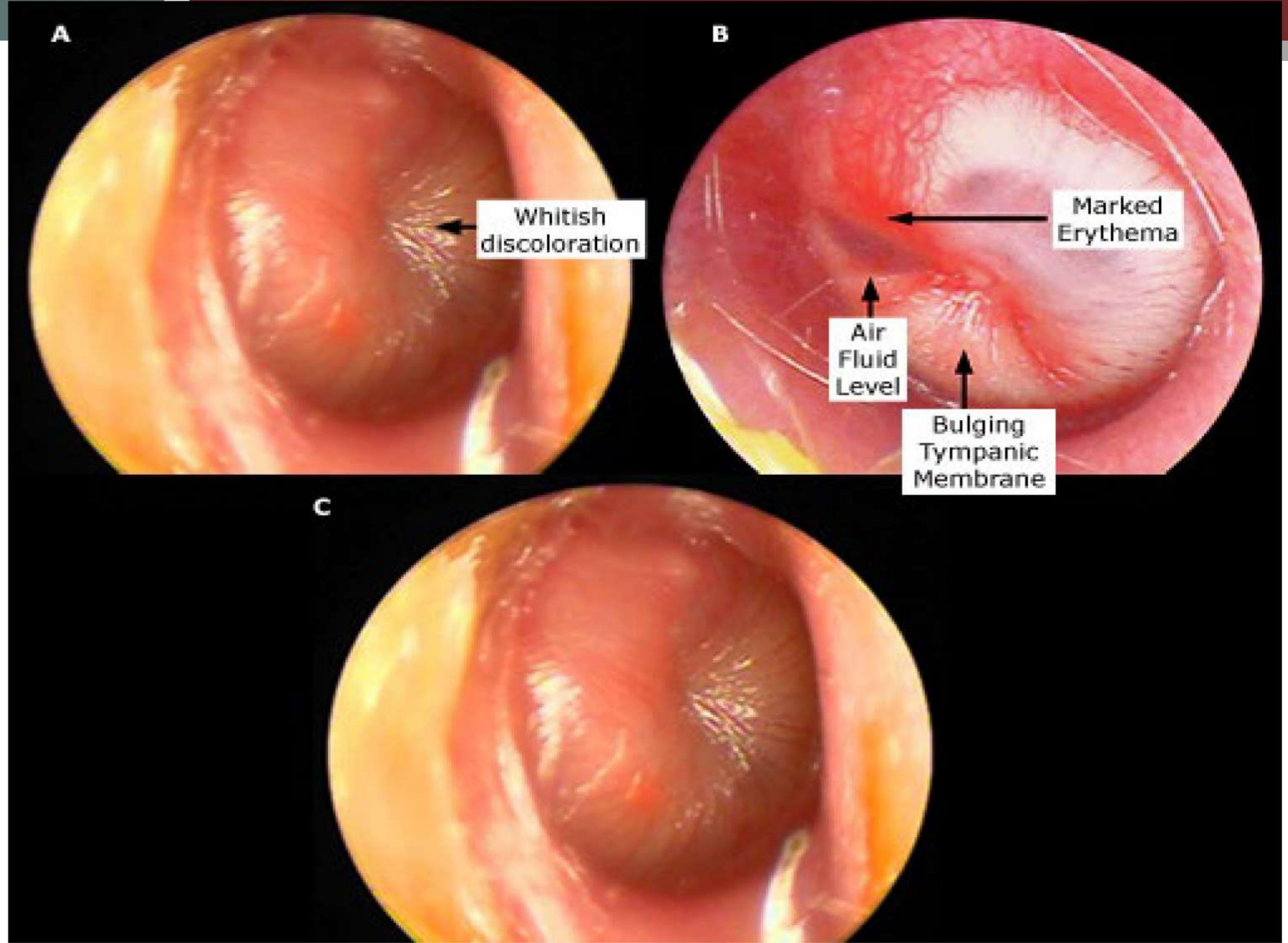
Pathogenesis

- Anatomic and physiologic disruption of eustachian tube drainage of the middle ear with subsequent fluid accumulation and bacterial infection
- Often follows viral respiratory infection

Pathogen	Proportion of cultures (2001-2003) (%)
S. pneumoniae	23
H. influenzae	36
M. catarrhalis	3
Group A *Streptococcus*	1.3
None	41

Symptoms

- **Symptoms/signs**
  - Fever, chills, ear pain, ear drainage, hearing loss, lethargy, irritability, pulling on ear
- **Exam**
  - Tympanic membrane erythema, loss of landmarks and bulge
  - Presence of middle ear fluid on pneumatic otoscopy or tympanometry, or otorrhea
  - If there is no middle ear fluid by above tests AOM should not be diagnosed


A
Whitish discoloration
B
Marked Erythema
Air Fluid Level
Bulging Tympanic Membrane
C

Pharyngitis

Pharyngitis

Acute pharyngitis is an inflammatory syndrome of the pharynx caused by viral and bacterial agents.

- The most important bacterial infections are due to the group A β hemolytic Streptococcus
- It is important to differentiate streptococcal from viral pharyngitis because only bacterial forms are sensitive
- to penicillin.

Etiology: Pharyngitis

Etiology	Syndrome/Disease
Bacterial	
Streptococcus pyogenes	Pharyngitis/tonsillitis
Mixed anaerobic bacteria	Vincent's angina
Haemophilus influenzae	Pharyngitis
Staphylococcus aureus	Pharyngitis
Corynebacterium diphteriae	Diphtheria
Mycoplasmal	
Mycoplasma pneumoniae	pneumonia
Unknown	

Clinical Features of Pharyngitis

Features suggestive of GAS etiology
Sudden onset sore throat
Fever
Headache
Tonsillopharyngeal inflammation
Tonsillopharyngeal exudate
Palatal petechiae
Tender anterior cervical adenopathy
Winter-early spring presentation
Age 5-15 years
History of exposure to GAS pharyngitis

Features suggestive of viral etiology
Absence of fever
Conjunctivitis
Coryza
Cough
Hoarseness
Ulcerative mouth lesions
Viral type rash

GAS:- Group A streptococci

Overlap between GAS and viral pharyngitis may be considerable

Acute Pharyngitis Diagnosis

- For adults and children with features that strongly suggest a viral etiology, testing is not indicated
- In persons with findings suggestive of GAS infection, confirmation with a rapid antigen detection test (RADT) or culture is needed
- In children and adolescents a negative RADT has a low negative predictive value and should be backed up with a throat culture for GAS

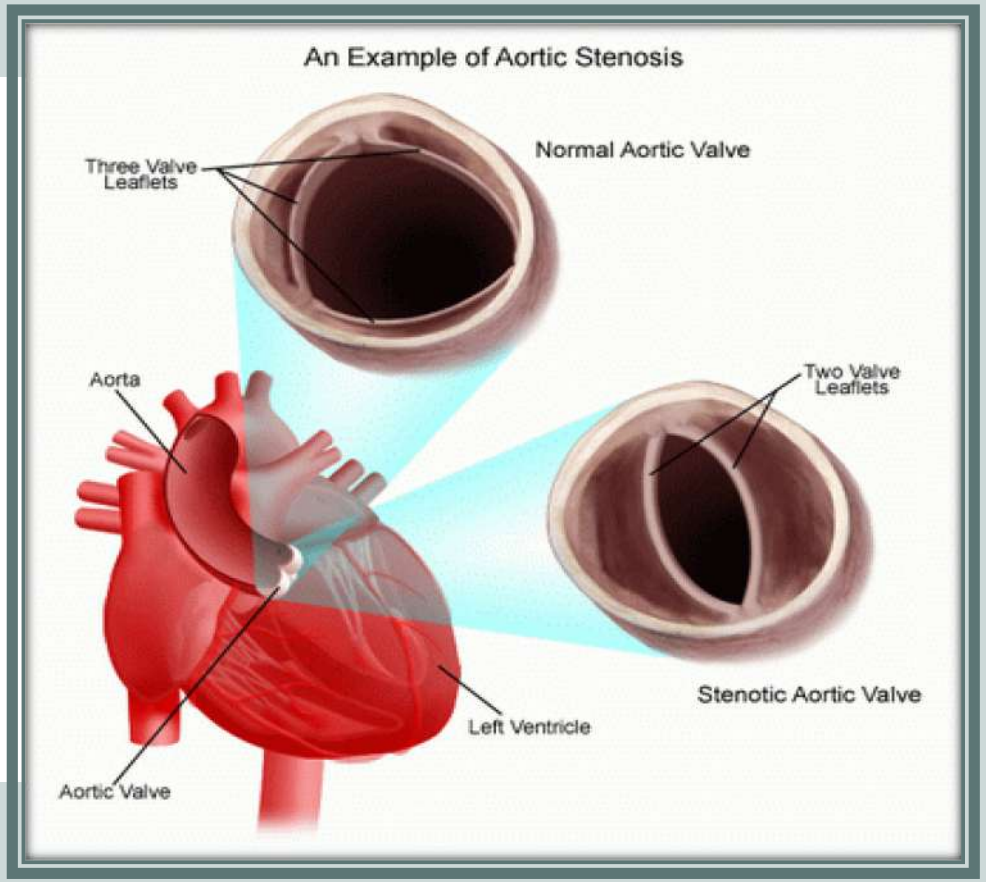
Pathogenesis

- In severe cases, there is marked pharyngeal pain, odinophagia and a temperature of 39.4 °C.
- Headache and abdominal pain may occur; the pharyngeal membrane is fiery red,
- Grayish-yellow exudate is presente on the tonsils.
- Enlarged, cervical nodes and a rise in the number of leukocytes are typical in acute suppurative bacterial infection

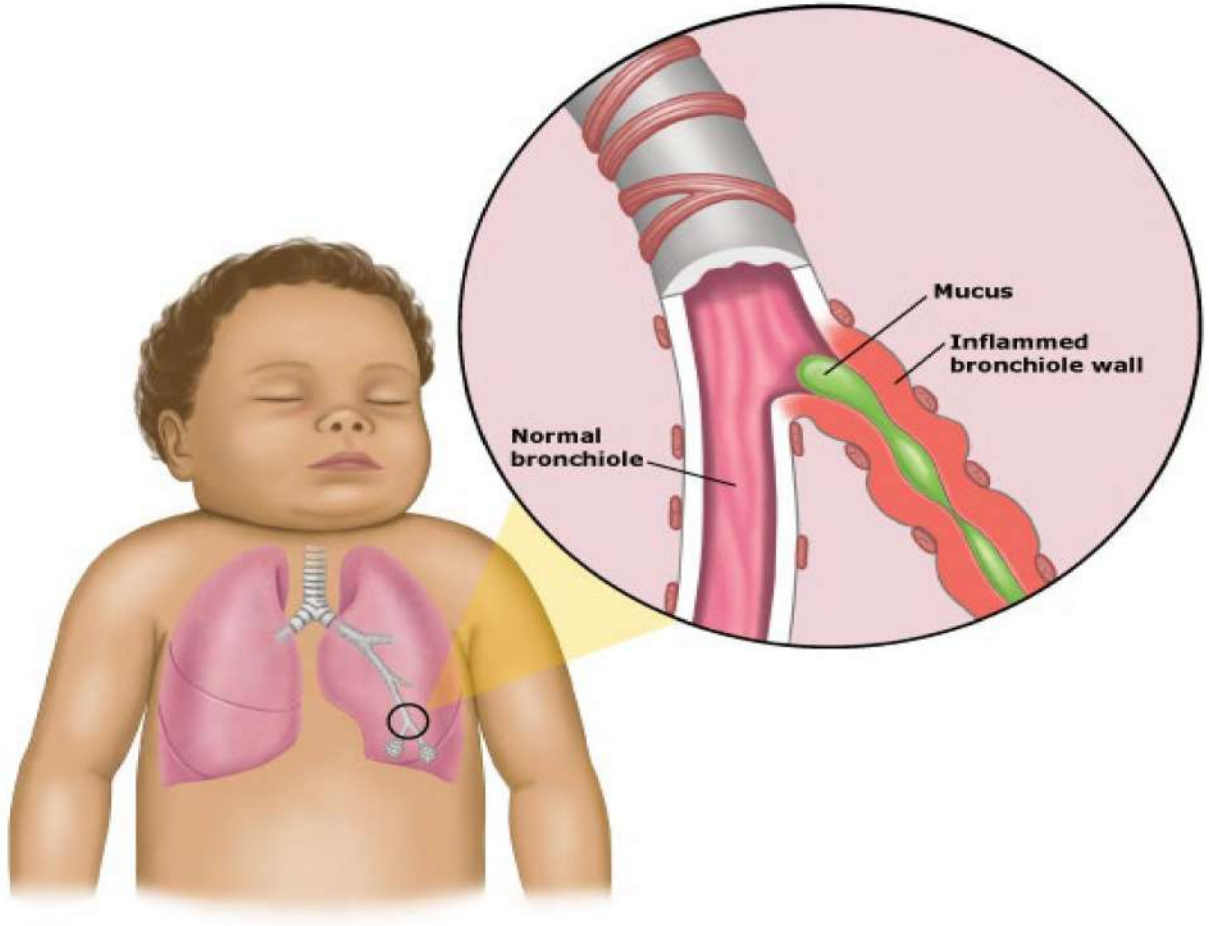
Streptococcal Pharyngitis: Complications

Complications of acute streptococcal pharyngitis include:

- Acute reumathic fever,
- Acute glomerulonephritis
- Invasive infections (meningitis, endocarditis etc)



Broncheolitis



Bronchiolitis is inflammation of the bronchioles, the smallest air passages of the lungs.

Etiology

- Respiratory syncytial virus is implicated in most cases.
- Other causative organisms include adenovirus, influenza, parainfluenza corona virus and rhinovirus also cause broncheolitis.

Pathogenesis

The inflammation of the bronchiolar mucosa

↓

edema, thickening, formation of mucus plugs and cellular derbis. Bronchiolar spasm occurs in some cases.

↓

The bronchial lumen, which is already narrow in the infants, is further reduced.

↓

Resistance to the airflow is increased both during inspiration and expiration. During expiration the bronchioles are partially collapsed

↓

This leads to trapping of the air inside the alveoli causing emphysematous changes. When obstruction becomes complete, the trapped air in the lungs may be absorbed causing atelectasis.

↓

Due to diminished ventilation and diffusion, hypoxemia is produced in almost all of these infants, retention of carbon dioxide leads to respiratory acidosis

Clinical Features

- Difficulty in breathing
- Prolonged expiration
- Persistent dry cough makes children restless and exhausted
- Fever and dehydration
- Cyanosis
- Inadequate intake of food may be due to cough and discomfort while swallowing.

Treatment

- Antibiotics are prescribed to treat the bacterial infection
- Humidified oxygen is required to relieve hypoxia
- Humid atmosphere can be maintained by placing a vessel of boiling water in a room to have a warm and humid atmosphere.
- Maintenance of fluid and electrolyte balance is essential in severe cases intravenous fluid is required, to maintain nutrition and hydration
- A recent Cochrane review on use of bronchodilators in bronchiolitis suggests that salbutamol with ipratropium inhalation may provide some benefit and there may be some beneficial effect of inhaled epinephrine.
- Continues positive airway pressure (CPAP) or assisted ventilation may be required to control respiratory failure.

Nursing Management

- The nasal passage of infants should be cleared because infants are nasal breathers
- The respiration should be monitored and the oxygen should be administered as required.
- Patients may be placed in a propped up position, with a pillow under the shoulder and head.
- The position should be changed every two hours.
- In the stage of a dyspnoea, nasogastric feeding can be given because the infants refuse oral feeding.

Pneumonia Facts: The forgotten Killer . . .

- Pneumonia Globally Pneumonia kills more children than AIDS, Malaria & Meningitis combined
- 1 in every 5 childhood deaths is due to Pneumonia
- 50% of World's Pneumonia deaths occur in India.
- India's under-five death toll is higher than the deaths in Nigeria, Congo & Pakistan put together.
- Only 69% children with pneumonia in India, are taken to a health facility, & only 13% get antibiotics.
- In India: Pneumonia kills 45 children in an hour

Pneumonia

What is Pneumonia?

- Pneumonia is inflammation of lungs in which the air sacs (alveoli) get filled with pus and may become solid
- Pneumonia also known as ALRI/ARI (Acute Lower Respiratory Tract Infection)
- Pneumonia is caused by virus, bacteria, fungi or parasites

Virus = RSV, Influenza, Para-influenza and Adeno

Bacteria = First two months of age ----------

Kleibsella
Ecoli
Staphylococcus

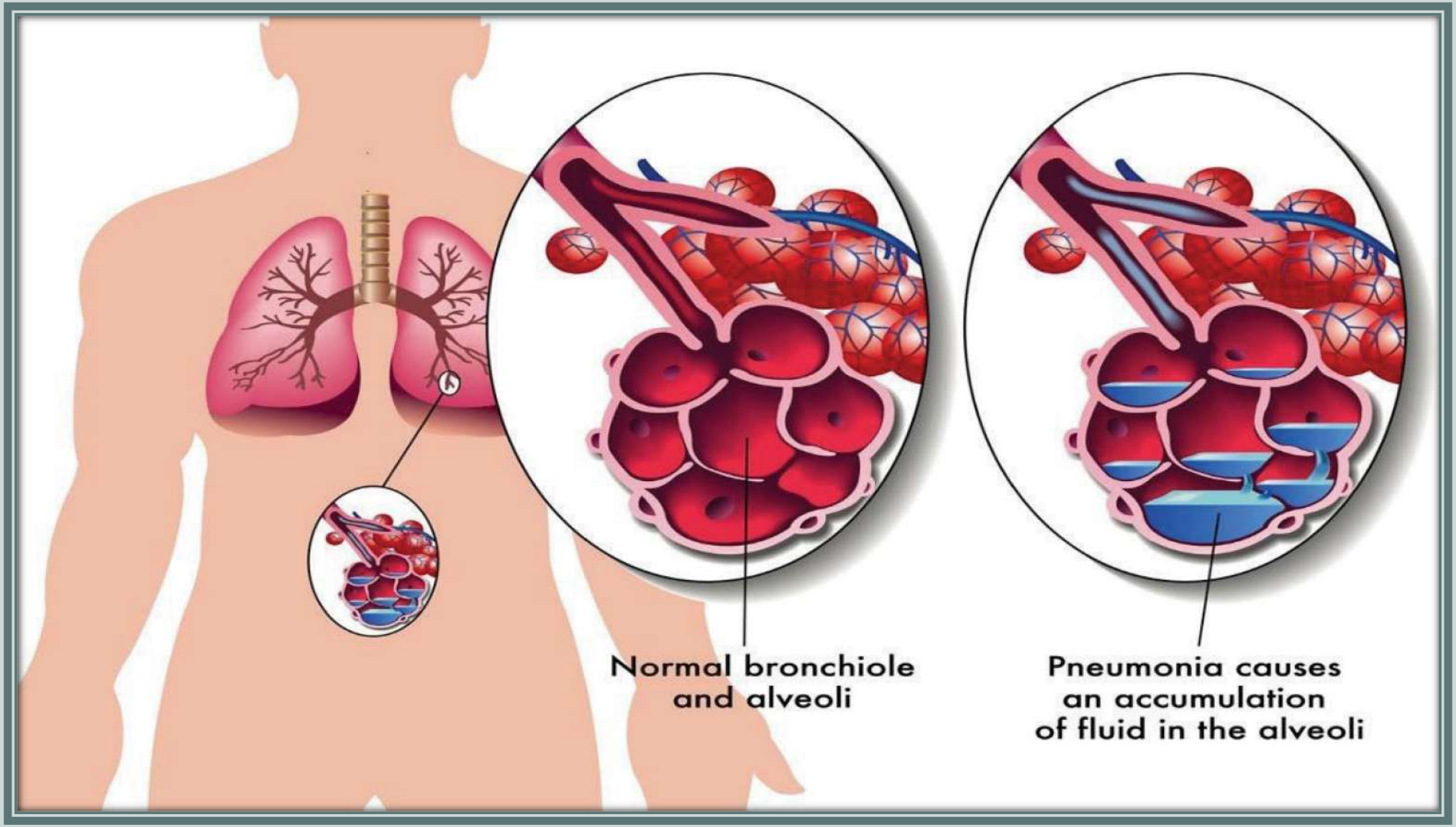
= 3 month to 3 years of age ----------

Streptococcus Pneumoniae
H. Influenzae
Staphylococcus

= More than 3 years of age ----------

Streptococcus Pneumoniae
Staphylococcus

Pathophysiology of Pneumonia



Clinical features

- Fever
- Cough that brings up mucus
- Shortness of breath
- Chest pain
- Rapid breathing

- Sweating
- Chills
- Headache
- Muscle aches
- Fatigue

Clinical Picture suggestive of Pneumonia

- **Fever**
- **Cough**
- **Tachepnea**

  (Out of proportion to degree of fever)
- Dyspnea
- **Retractions**
- Auscultations
  - Wheezing
  - Crackles
- Chest Pain
- Grunting
- Cyanosis

	SENSITIVITY	SPECIFICITY
TACHEPNOEA	**Up to 81%**	**Up to 70%**
CREPITATIONS	**Up to** 57%	**Up to** 80%
Chest in-drawing	**Up to 35%**	**Up to 84%**

Tachepnea

- All tachepnea are not Pneumonia.
- Severity of tachepnea has better correlation with severity of illness
- Respiratory Rate May actually fall in a exhausted child

0 Months - 2 Months	>60 / minuet
2 Months - 1 Year	>50 / minuet
1 Year - 5 Year	>40 / minuet
> 5Year	>30 / minuet

Two Important Clinical Signs for Assessing Pneumonia-

a) Fast Breathing

b) Chest Indrawing

If the child's age is	The child has fast breathing if you count
2 months up to 12 months	50 breaths per minute or more
12 months up to 5 years	40 breaths per minute or more

Classification of Pneumonia

SIGNS	Classify as	Management
• General danger signs (inability to breastfeed or drink, lethargy or reduced level of consciousness, convulsions) • Stridor in calm child	Severe Pneumonia Or Very Severe Disease	• Hospitalize • Give oxygen if saturation < 90% • Manage airway • Give recommended antibiotics
• Chest indrawing OR • Fast breathing: (Respiratory rates o 2-11 months ≥50/min o 12-59 months ≥40/min)	Pneumonia	• Give Oral Amoxicillin for 5 days • Treat wheeze if present • Advice home care for cough & cold • Advise mother when to return immediately • Follow up after 2 days
No signs of severe PNEUMONIA or PNEUMONIA	No Pneumonia	• Advice home care for cough & cold • If coughing for more than 14 days, refer for assessment • Follow up after 5 days if not improving

* If the child has wheezing, give 3 doses of nebulized salbutamol for 20 minutes; or 2-4 puffs of salbutamol MDI (at a gap of 2-3 min between each puff) with spacer repeated every 20 minutes and reassess

Diagnosis

- The diagnosis based on history and physical examination.
- Complete blood count (CBC).
- An elevated number of white blood cells may indicate a bacterial infection.
- A chest X-ray is one of the best ways to diagnose this condition. This helps to locate the areas that are affected by bronchopneumonia

Treatment

Treatment of Pneumonia with Amoxicillin-

Give amoxicillin by mouth every morning and every night for 5 days. The amoxicillin is 25 mg/kg 2 times a day

AGE or WEIGHT	Amount of Amoxicillin to be given orally as syrup (125 mg per 5 ml) twice a day x 5 days	Amount of Amoxicillin to be given orally as a dispersible tablet (250 mg) twice a day x 5 days
2 months up to 4 months (4 to < 6 kg)	5 ml	½
4 months up to 12 months (6 kg to < 10 kg)	10 ml	1
12 months up to 3 years (10 kg to <14 kg)	15 ml	1½
3 years up to 5 years (14 kg to <20 kg)	-	2

Indications For Hospitalization

- Age < 2 Months
- **Severe & V. Severe** Pneumonia
- **Immunocompromised** Status
- **Dehydration,** Vomiting or Poor Feeding
- Unable to mount effective defense
- **Failure to respond** to oral Antibiotics
- Inadequate observation or supervision by family
- **All indications for ICU admission**

Nursing management

- The observation of the respiration for the pattern, respiratory rate and nasal flaring and for cyanosis. Patient should be observed for any strider and wheezing.
- Sufficient humidified oxygen should be provided.
- The behavioural changes or restlessness should be notified.
- Position should be changed every two hours. Comfortable semi sitting position may help to relieve respiratory difficulty.
- Adequate fluid intake may be maintained.
- The accurate intake and output record should be maintained. If children are in respiratory distress, they should not be given anything by mouth. They should be observed for vomiting, and distension.
- Intravenous fluid may be prescribed and it should be monitored.
- Nutritional status should be maintained
- Children should not be disturbed unnecessary.
- The body temperature should be maintained within the normal limits.
- In some cases postural drainage and breathing exercise during convalescent period.

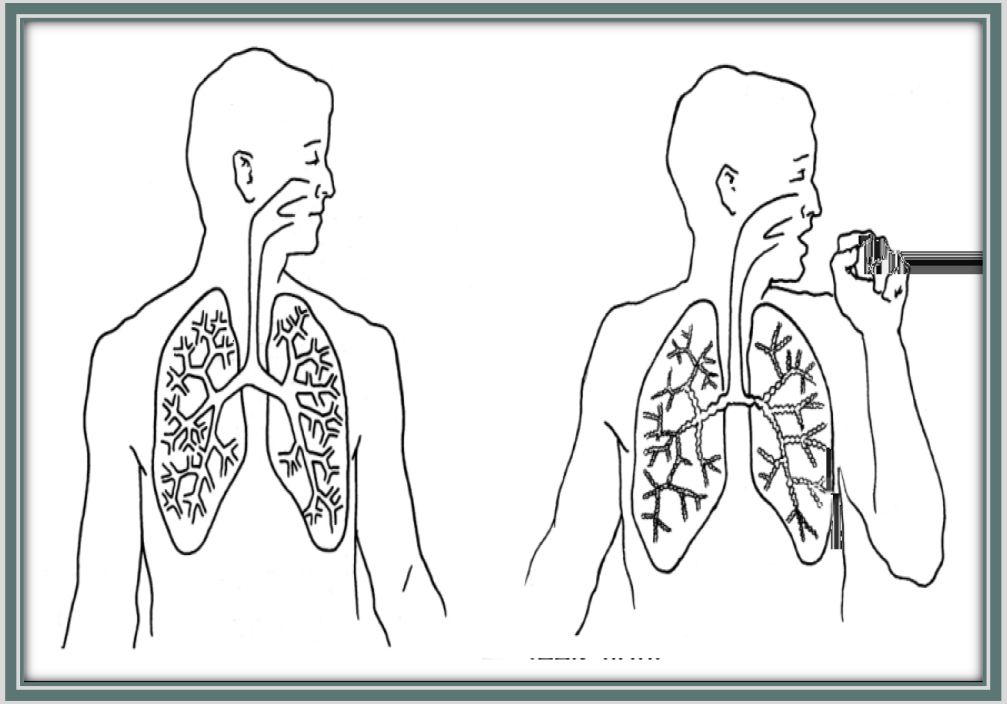
Asthma

Definition Asthma is a condition of the lungs in which there is a airway obstruction due to spasms of the bronchial smooth muscle, edema of the mucosa and increased mucus secretion in the bronchi and bronchioles brought on the various stimuli.

Types

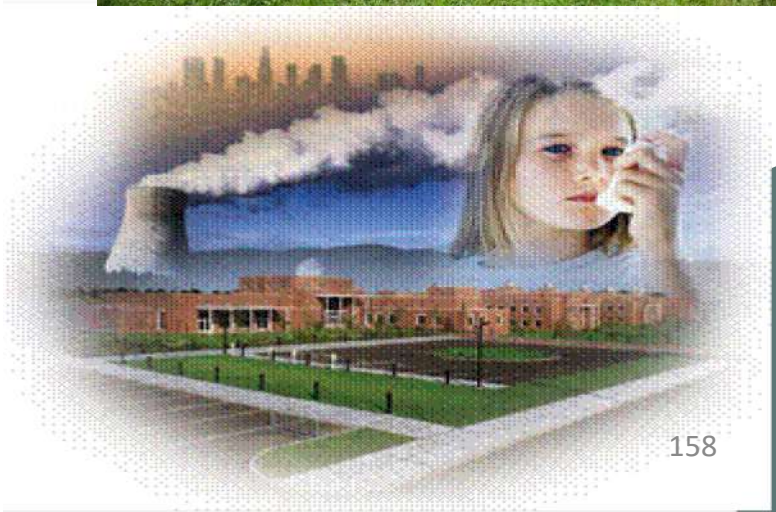
Mild intermittent asthma

- Symptoms ≤2 times a week
- Night time symptoms ≤2 times a month
- Peak expiratory flow(PEF) or forced expiratory volume(FEV1)≥80% of predicted value
- PEF variability <20%

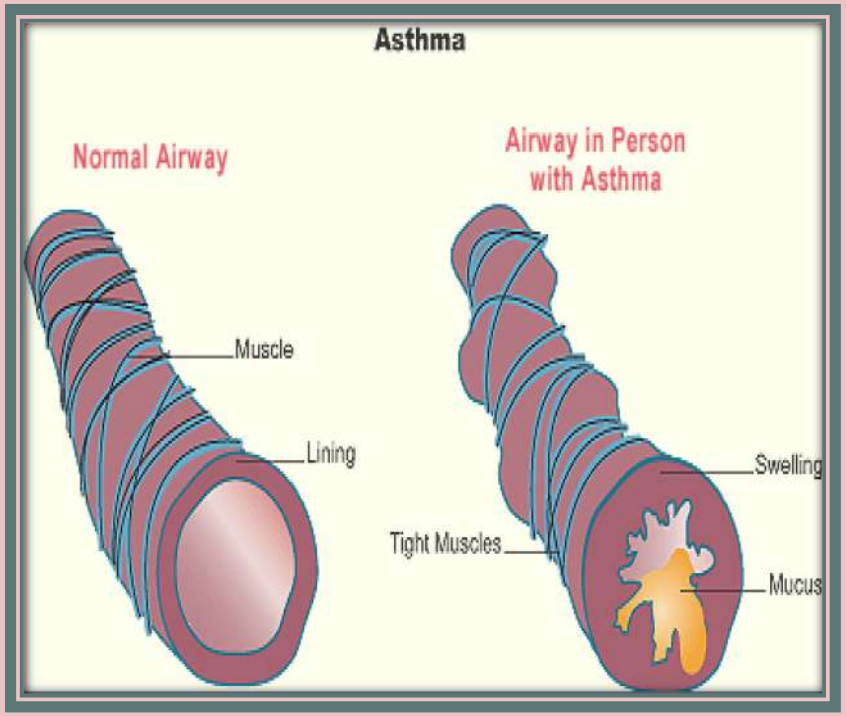


Causes

- Allergy to pollens, foods, and antigen antibody reaction
- Infection
- Physical factors such as cold, humidity, sudden changes in temperature and sudden changes in barometric pressure
- Irritants such as dust, chemicals, and air pollutants.
- Psychological or emotional stress
- Exercise



Pathophysiology



Asthma is the result of chronic inflammation of the airways which subsequently results in increased contractibility of the surrounding smooth muscles.

This among other factors leads to narrowing of the airway and the classic symptoms of wheezing. The narrowing is typically reversible with or without treatment.

Typical changes in the airways include an increase in eosinophils and thickening of the lamina reticularis.

Chronically the airways' smooth muscle may increase in size along with an increase in the numbers of mucous glands. Other cell types involved include: T lymphocytes, macrophages, and neutrophils

There may also be involvement of other components of the immune system including: cytokines, chemokines, histamine, and leukotrienes among others.

Manifestations

- Onset may be gradual with nasal congestion and sneezing
- Wzeezing
- Anxiety
- Apprehension
- Diaphoresis
- Uncontrollable cough

- Dyspnoea
- Flaring of the nostrils
- Cyanosis
- Hyperapnoea
- Increased pulse
- Increased respiratory rate
- Vomiting

Treatment

Fast–acting

- Short-acting beta$_2$-adrenoceptor agonists (SABA), such as salbutamol (*albuterol* USAN) are the first line treatment for asthma symptoms. They are recommended before exercise in those with exercise induced symptoms
- Anticholinergic medications, such as ipratropium bromide, provide additional benefit when used in combination with SABA in those with moderate or severe symptoms.

Long-term control

Corticosteroids are generally considered the most effective treatment available for long-term control. Inhaled forms such as beclomethasone are usually used except in the case of severe persistent disease, in which oral corticosteroids may be needed. It is usually recommended that inhaled formulations be used once or twice daily, depending on the severity of symptoms.

Diarrhea

What will be covered in this Session

- Introduction
- Etiopathogenesis of Acute Diarrhea
- Dysentery
- To assess severity of dehydration
- Management of dehydration – Plan A/B/C
- Nutritional management
- Zinc in treatment of diarrhea
- Indications for antimicrobials
- Probiotics in acute diarrhea
- Patient Education

What is not Diarrhea?

- Passage of frequent formed stools
- Frequent loose greenish yellow stools on D3/D4 of life (Transitional diarrhea)
- Passage of pasty stools in a breast fed infant
- Passage of stools during / immediately after feeding due to gastro-colic reflex

Diarrhea

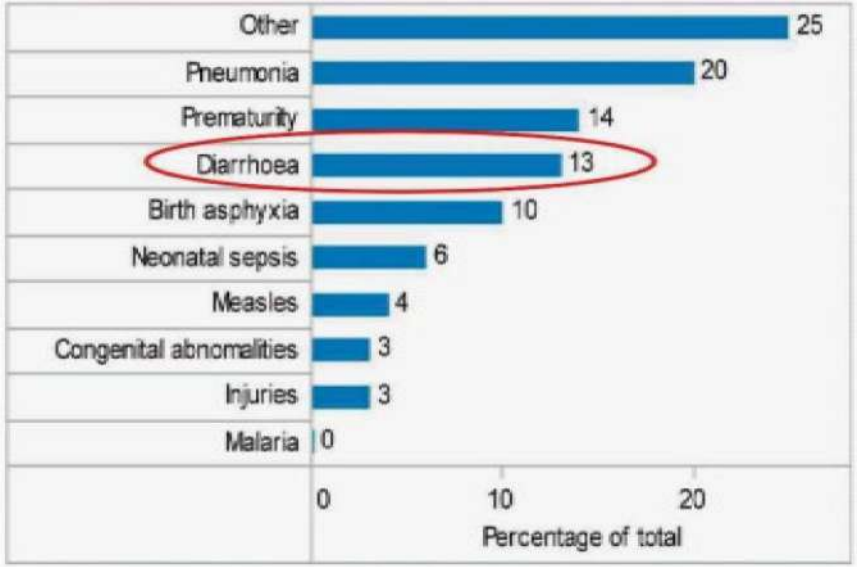
- Diarrhea is the passage of 3 or more loose or liquid stools per day, or more frequently than is normal for the individual

The character of the stools is more important than the number.

Persistent diarrhea

- Acute diarrhea episode that lasts for ≥ 14 days.

Under 5 Mortality amongst children



Etiology of Acute Diarrhea

Common viruses
- Rotavirus
- Norwalk virus
- Adenovirus
- Astrovirus

Common bacteria
- E coli
- Shigella
- Salmonella
- V cholera
- Giardia
- Campylobacter jejuni

Parasites
- Cryptosporidium
- Giardia
- E histolytica
- Isospora belli

Etiology

- A recent study (2010) amongst subjects (n = 2536) (including under-five children) hospitalized with acute diarrhea, reported
  - Rotavirus (48%)
  - Diarrheogenic *E. Coli (19%)*
  - Vibrio(19% each),
  - Giardia (14%)
  - Adenovirus (12%)
  - Cryptosporidium (11%)

Further, this study documented mixed infections in a substantial (48%) proportion of children.

Dysentery

- Dysentery - Diarrhea with presence of visible blood in stools plus presence of cramps, fever or mucoid stools.
- Dysentery does not include blood streaks on surface of formed stool or blood detected only by microscopic examination or biochemical tests or digested blood (malena).
- When a bacterium is responsible for dysentery then it is known as **acute bacillary dysentery.**

Dysentery

- **Organisms responsible for acute bacillary dysentery are**
  - Shigella
  - Non typhi Salmonella
  - Clostridium jejuni
  - Shiga toxin producing E coli 0157 and non 0157 strains;
  - Yersinia enterocolitica
  - Non cholera vibrios
  - Clostridium difficile and
  - Less commonly Aeromonas and Pleisomonas.

Classification of dehydration

Not enough signs to classify as some or severe dehydration	No dehydration
Any two of the following signs : • Restless , irritable • Sunken eyes • Drinks eagerly, thirsty • Skin pinch goes back slowly	Some dehydration
• Lethargic or unconscious • Poor oral acceptance •Very slow return of pinched skin • Sunken eyes	Severe dehydration

How to assess skin pinch

- Pinch the skin, halfway between the umbilicus and anterior superior iliac spine, of the abdomen for 1 second and then release the grip - if the pinched portion of skin takes longer than 2 seconds to go back to its original position, it signifies severe dehydration.

Plan of Treatment

- **No dehydration - Plan A**
- **Some dehydration - Plan B**
- **Severe Dehydration - Plan C**

Plan A (No dehydration)

ORS

- Training parent /guardian how to prepare ORS
- Taking into consideration 2 different types of ORS available in the Indian market one for 200 ML and the other for 1 L water

Home-based fluids

- Salted rice water
- Salted yoghurt drink
- Coconut water
- Other fluids the child usually consumes
- Do not give - fruit juices, tea and / or aerated drinks

PLAN – B (Some dehydration)

- Make ORS available for the child and specify to parent or guardian the quantity to be administered.
- Volume of ORS- 70 ml/kg (Approx).
- **ADVICE (over 4 hour period of rehydration):-**
  - Instruct parent / guardian to administer the specified quantity of ORS by oral sip feeding using a spoon.
  - If vomiting occurs, wait for at least 10 minutes before giving more ORS and administer more slowly
  - Encourage breast feeds, give ORS solution when child finishes breastfeeding

Plan C – Severe Dehydration

- Start IV fluid immediately. If the child can drink, give ORS by mouth while the drip is set up. Give 100ml/kg Ringer's lactate solution (or, if not available, normal saline), divided as follows:

Age	First give 30ml/kg in	Then give 70ml/kg in
Infants (Under 12 months)	1 hour*	5 hours
Children (12 months up to to 5 yrs)	30 minutes*	2½ hours
*repeat once if radial pulse is still very week or not detectable		

Plan C – Severe Dehydration Cont…

- Reassess the child every 1-2 hours. If hydration status is not improving, give the IV drip more rapidly.
- Also give ORS (about 5ml/kg/hour) as soon as the child can drink: usually after 3-4 hours (infants) or 1-2 hours (Children)
- Reassess an infant after 6 hours and a child after 3 hours. Classify dehydration. Then choose the appropriate plan (A,B or C) to continue treatment

Role of probiotics and anti-secretory drugs

- Global recommendations* for probiotic use in acute gastroenteritis provide Level 1A Evidence of efficacy of 2 probiotic strains in treatment:-
  - Lactobacillus GG
  - Saccharomyces boulardii (1 sachet of 250 mg twice daily for 5 days)

  * ESPGHAN 2014, NICE(U.K.) Guidelines, LASPGHAN 2010, WGO 2010

- Fewer studies on probiotics have been conducted in India and data still evolving.

- Anti-secretory drugs – Not recommended

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Patient Education

- Inability to drink or breastfeed
- Worsening clinical status (e.g. convulsions, abdominal distension, lethargy)
- Fever
- Blood in stool
- Failure to pass urine for > 6 hours

Important

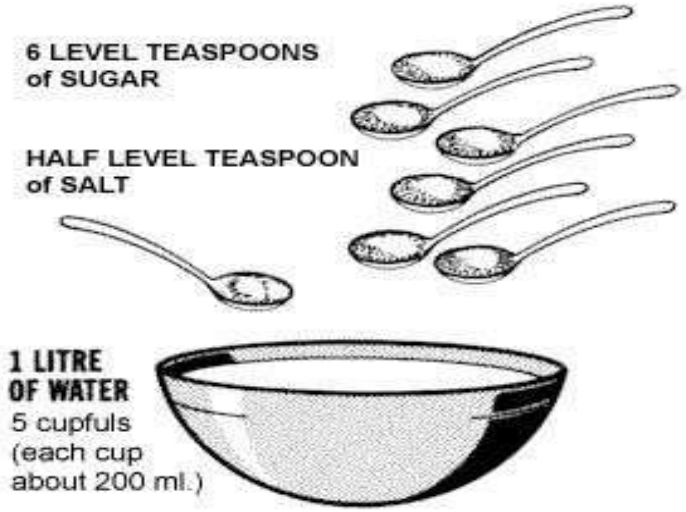
Tell mother to come back if diarrhea does not stop in 5 days (Median duration of Rotavirus diarrhea is 8 days)

Low Osmolarity ORS Solutions

Standard ORS Solution	Low Osmolarity ORS (mEq or mmol/L)	
Glucose	**111**	**75**
Sodium	**90**	**75**
Chloride	80	65
Potassium	20	20
Citrate	10	10
Osmolarity	**311**	**245**

Currently only low osmolarity ORS in present for use in India

- Stir the mixture till the salt and sugar dissolve.



Home made ORS

Role of zinc in the management of diarrhea

- 20 mg per day of zinc supplementation for 14 d starting as early as possible after onset of diarrhoea
- 10 mg per day for infants 2-6 mo
- Administration: Once or twice daily

Which zinc formulation to use?

Zinc gluconate, sulfate, acetate available
Zinc sulfate is being used in the Government programme

Several Commercial preparations (Drops, syrups and dispersible tablets available)
Better to familiarize with one or two preparations

ZINC Must be a part of every prescription of acute diarrhea

The use of zinc in UNICEF analysis in 2009 was <2% however though no current data is available, zinc supplementation seems to be high presently.

Role of Antibiotics in Acute Diarrhea

Indications for use of antimicrobials

Antimicrobials are indicated in:-

- Presence of systemic infection
- Cholera
- Gross blood mixed with stool (Dysentery)
- Severe malnutrition
- Entameoba Histolytica
- Cryptosporidium
- Immune deficiency

Antibiotics in Dysentry

Diagnosis	Antibiotics
Dysentry (Shigella)	3rd Generation Cephalosporin - IV Ceftriaxone – Sick -(50-75mg/day in q BD x 5days) - Cefixime –Non sick – 10mg/kg/day in 2 div doses - Ciprofloxacin 10mg/kg/dose x 12 hrly
Cholera	Single dose Azithromycin or Erythromycin is the DOC in children
Entameoba Histolytica	Metronidazole 10mg/kg/dose 8 hrly x 5 days
Cryptosporidium	Nitazoxanide: 1-3 yrs: 100mg BD x 3 days 4-11 yrs: 200 mg BD x 3 days
Immune deficiency	Broad spectrum antibiotics depending upon the severity of infection

Role of probiotics and anti-secretory drugs

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ispghan

Patient Education

- Inability to drink or breastfeed
- Worsening clinical status (e.g. convulsions, abdominal distension, lethargy)
- Fever
- Blood in stool
- Failure to pass urine for > 6 hours

Important

Tell mother to come back if diarrhea does not stop in 5 days (Median duration of Rotavirus diarrhea is 8 days)

Prevention

- Hand Washing
- Proper disposal of excreta
- Safe water for drinking
- Appropriate feeding practices-
  - Exclusive BF in 1st six months,
  - Fresh and clean preparation of complementary feeds,
  - **NO BOTTLE FEEDS**
- Vaccines - Rotavirus vaccine
  - Cholera vaccine

Hand washing

Pathogens causing diarrheal diseases
Mostly transmitted through the feco-oral route

Interventions promoting hand washing and other hygiene measures clearly show a reduction in diarrheal risk in the short term

The sustainability of hand washing-behavior in the communities require investigation

The evidence of reduction in risk of diarrheal illnesses after scaling up the intervention in uncontrolled situations is not available
India-specific data on hand washing are scarce

Nutrition in Diarrhea

Appropriate feeding during diarrhea is encouraged as it leads to:

- Decrease in stool output
- Shortened duration of illness
- Significant weight gain
- Improved nutritional status

Continue Feeding

Continue usual feeding, which the child was taking before becoming sick

- **Up to 6 months of age:**
  Exclusive Breast feeding
- **6 months to 12 months of age:**
  Add cereal based complementary Feeding
- **12 months and above:**
  Family Food

6 माह के बाद माँ के दूध के साथ सही भोजन

आयु	आहार की किस्म	आहार कितनी बार दें	मात्रा
6–8 माह	नरम दलिया, गाढ़ी दाल, खीर, मसली हुयी सब्जी, फल, घी, मक्खन व तेल	2–3 बार खाना व स्तनपान 6 बार	250 ग्राम की कटोरी से आधी कटोरी
9–11 माह	नरम दलिया, गाढ़ी दाल, चावल, सब्जी, फल, घी, मक्खन व तेल, उबला अण्डा	3 बार खाना 1 बार नाश्ता व स्तनपान 6 बार	250 ग्राम की कटोरी से पौन कटोरी
12–24 माह	रोटी, चावल, दलिया, गाढ़ी दाल, सब्जी, फल, घी, मक्खन व तेल, उबला अण्डा, मॉस, मछली / कलेजी	3 बार खाना 2 बार नाश्ता व स्तनपान 4–6 बार	250 ग्राम की कटोरी से पूरी कटोरी

unicef
unite for children

Chart 10.2: Key feeding problems and possible solutions

Feeding Practices	Possible Solution
Complementary Feed started too early (<6 months of age)	• Build mother's confidence that she can produce all the breast milk that the child needs • Suggest giving more frequent, longer breastfeeds day or night, and gradually reducing other milk or foods
Complementary Feed is Delayed	• Offer small amounts of soft mashed cereals, pulses, vegetables and fruits • Try one new food at a time for 2-3 days • If a child refuses a particular food, try again after a week
Complementary feeds that are introduced are too thin or lack variety	• Offer mashed soft foods and gradually increase the consistency (thicker) as the child gets older • Offer chopped fine family foods to 10-12 months old children • Offer locally available variety of foods such as cereals, pulses, seasonal vegetables, green leafy vegetables and fruits • Add 1 teaspoon of cooking oil to the food
Child eating inadequate amounts of foods	• Feed frequently as the child gets older • Feed 6-9 months old babies at least ½ a katori/sitting 4 times a day (total at least 2 katoris a day) • Feed 10-12 months old babies at least ½ a katori/sitting 5 times a day (total at least 2½ katori a day) • Breastfeed before offering food to the baby
Child does not show interest in eating	• Encourage the child to eat • Talk to child by describing the texture, smell and taste of the food. • Be patient and affectionate while feeding the child • Discourage from threatening, forcing or showing anger at the child who refuses to eat
Child eats from a common plate with older sibling	• Feed the child from a separate bowl • Sit with the child and feed the child attentively without distraction • Monitor the amount of food the child eats • Supervise the child while feeding
If the child is not eating well during illness	• Continue to breastfeed more frequently and for longer time, if possible • Use soft, varied, appetizing, favorite foods to encourage the child to eat as much as possible • Offer frequent small feedings • Clear a blocked nose if it interferes with feeding • Expect that appetite will improve as child gets better
Child is fed from a bottle	• Recommend substituting a cup for a bottle • Inform the mother that a cup is easier to clean and does not interfere with breastfeeding. • Show the mother how to feed the child with a cup

Chart 10.4: Guiding Principles for Complementary Feeding of the Breastfed Child

- Practice exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed.
- Continue frequent, on-demand breastfeeding until 2 years of age or beyond.
- Practice responsive (active) feeding, applying the principles of psychosocial care.
- Practice good hygiene and proper food handling.
- Start at 6 months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding.
- Gradually increase food consistency and variety as the infant grows older, adapting tothe infant's requirements and abilities.
- Increase the number of times that the child is fed complementary foods as the child gets older.
- Feed a variety of nutrient-rich and energy-dense foods from the family pot to ensure that all nutrient needs are met.
- Use iron rich complementary foods or vitamin-mineral supplements for the infant, as needed.
- Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, favourite foods. After illness, give food more often than usual andencourage the child to eat more.

Thank You