NEWBORN EXAMINATION-IS MY BABY FINE?

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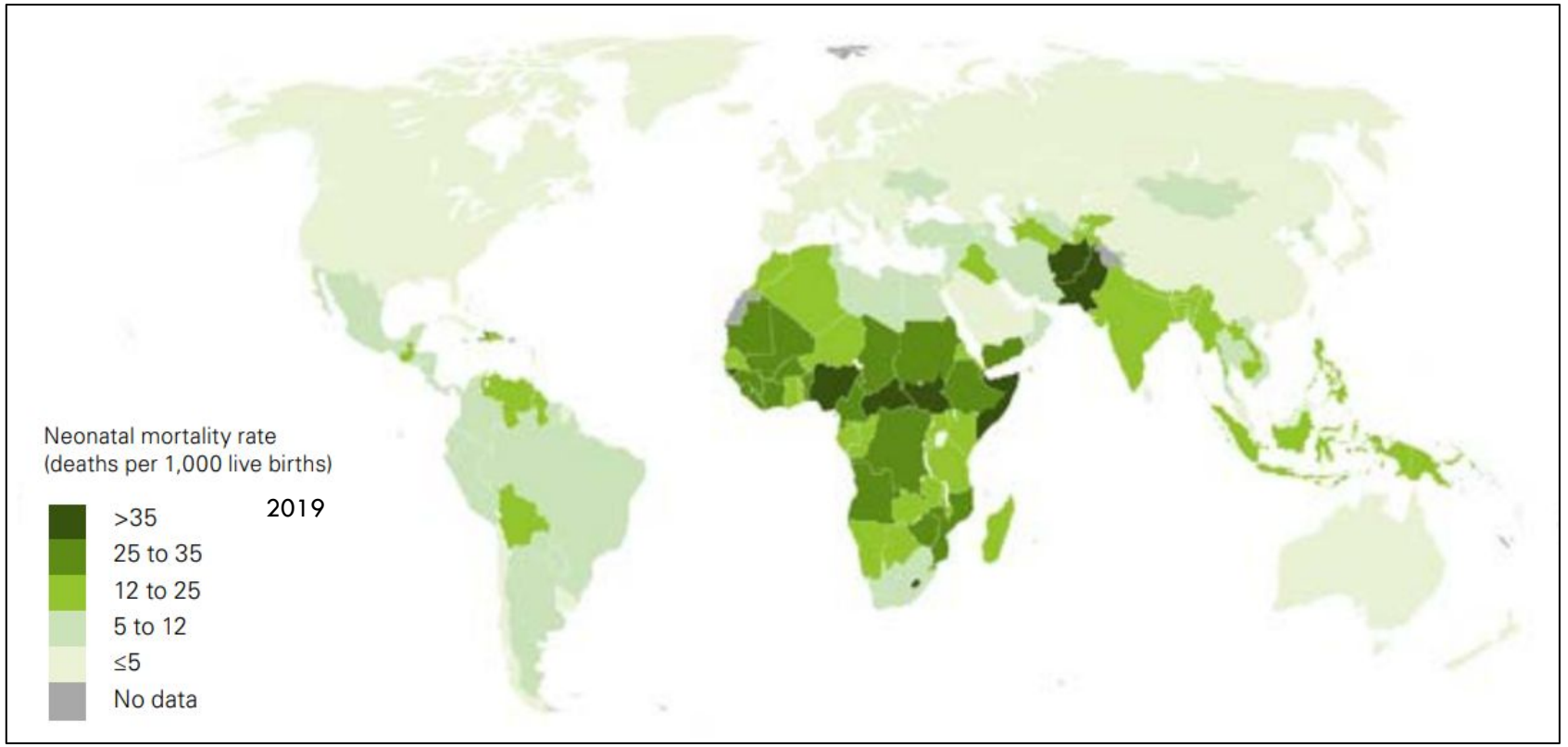
23rd May 2025

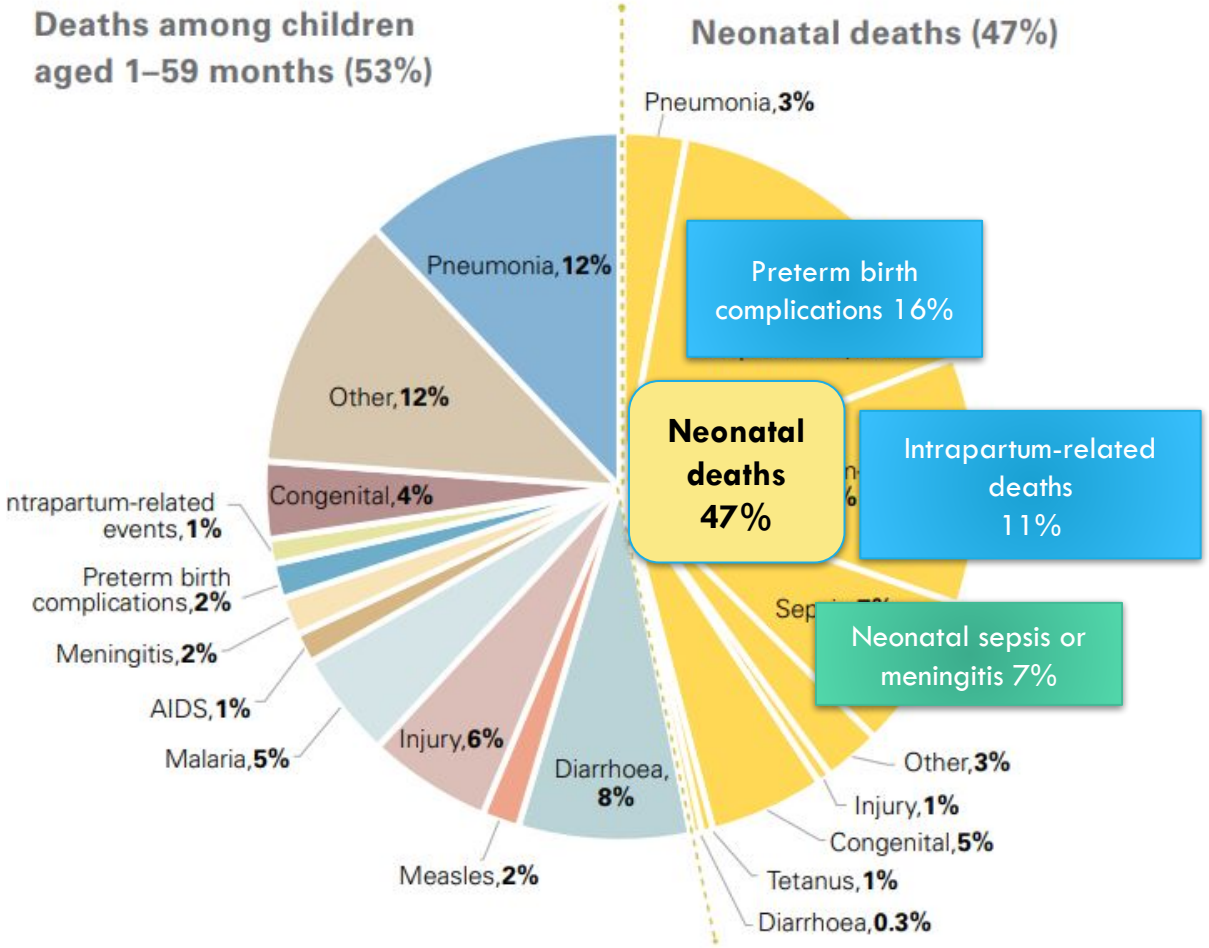
NEONATAL MORTALITY



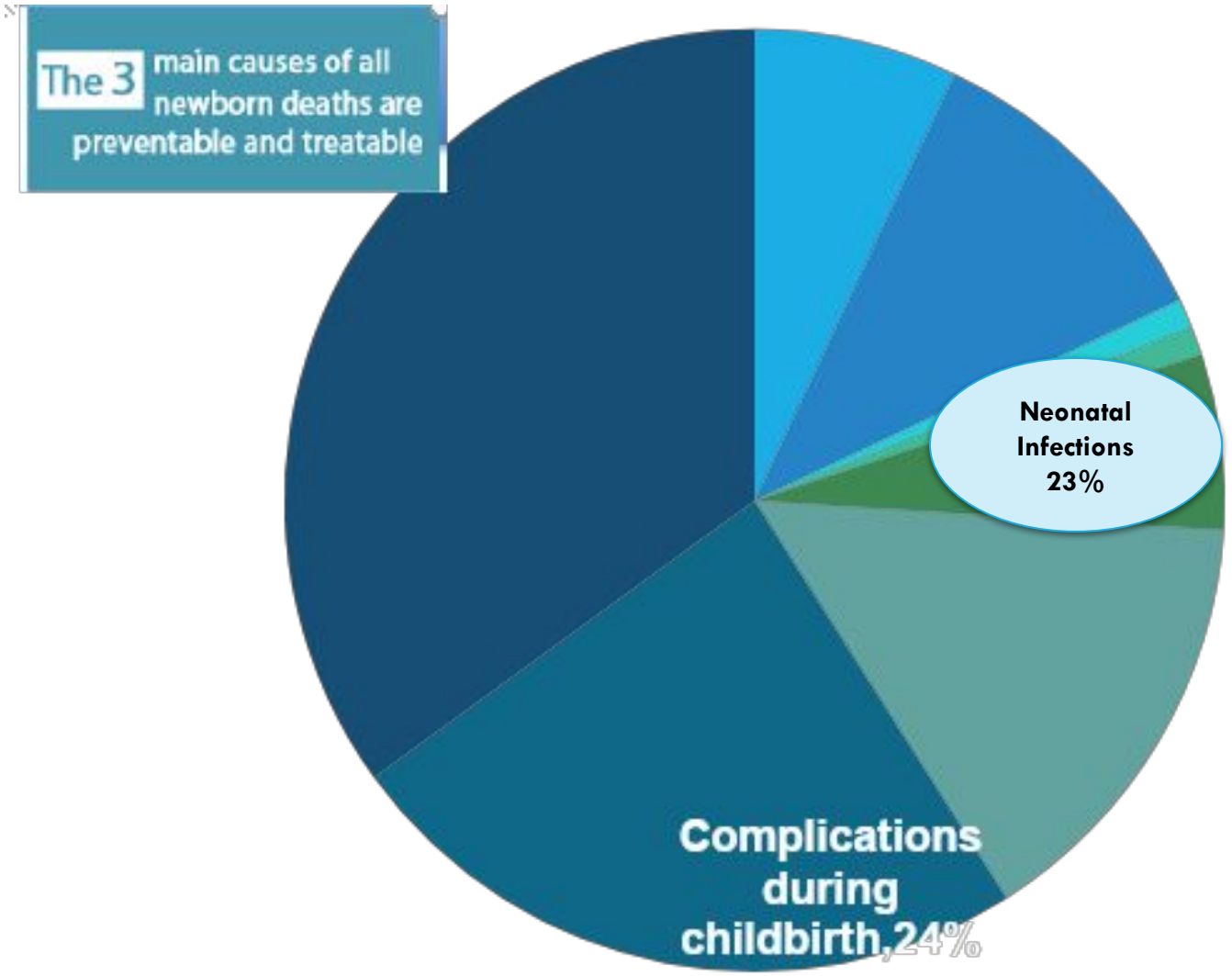
UN, IGME Child Mortality Report 2020

The highest burden of neonatal mortality falls in sub-Saharan Africa and Asia where mortality rates are up to ten times that in high income settings

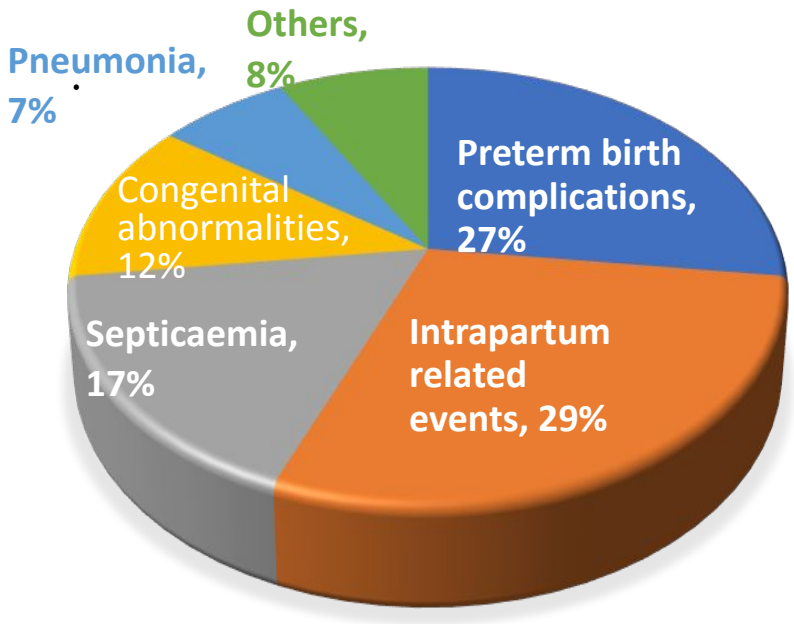
Childhood mortality

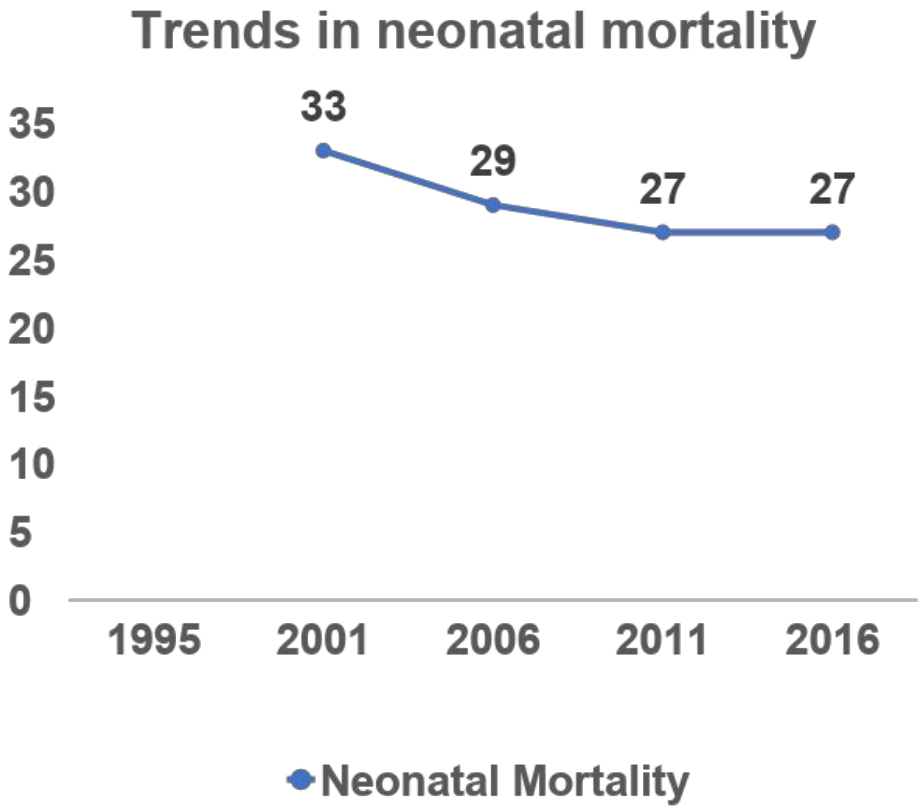


UN IGME Child Mortality Report 2019


The 3 main causes of all newborn deaths are preventable and treatable
Neonatal Infections 23%
Complications during childbirth,24%

CAUSES AND TRENDS OF NEONATAL DEATHS IN UGANDA- PDSR





Source: MPDSR Report,

BACKGROUND

Neonatal mortality rate in Uganda is at 22 deaths per 1000 live births (UDHS 2022)

FY 2022/2023 NDPIII target 21 per 1000 live births

In Kampala neonatal deaths 40 per 1000 live births (DHIS2,July 2021-April 2022)

Birth Asphyxia contributes 61% of the deaths(DHIS 2)

BACKGROUND

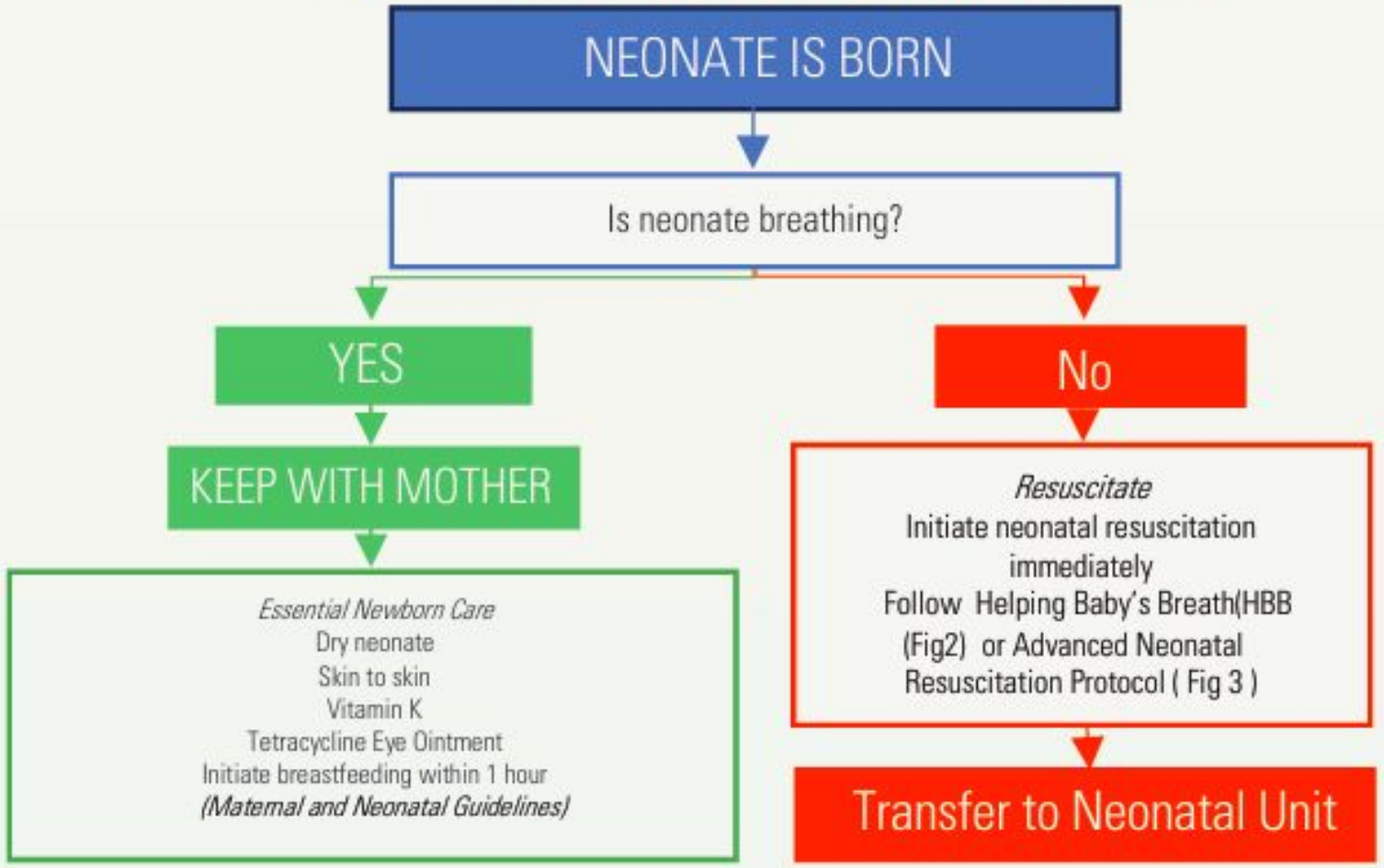
Immediate and appropriate inpatient new born care through health facility based neonatal care and stabilization units reduce preventable newborn morbidity and mortality

Health care access and quality contributes to reduction in neonatal mortality

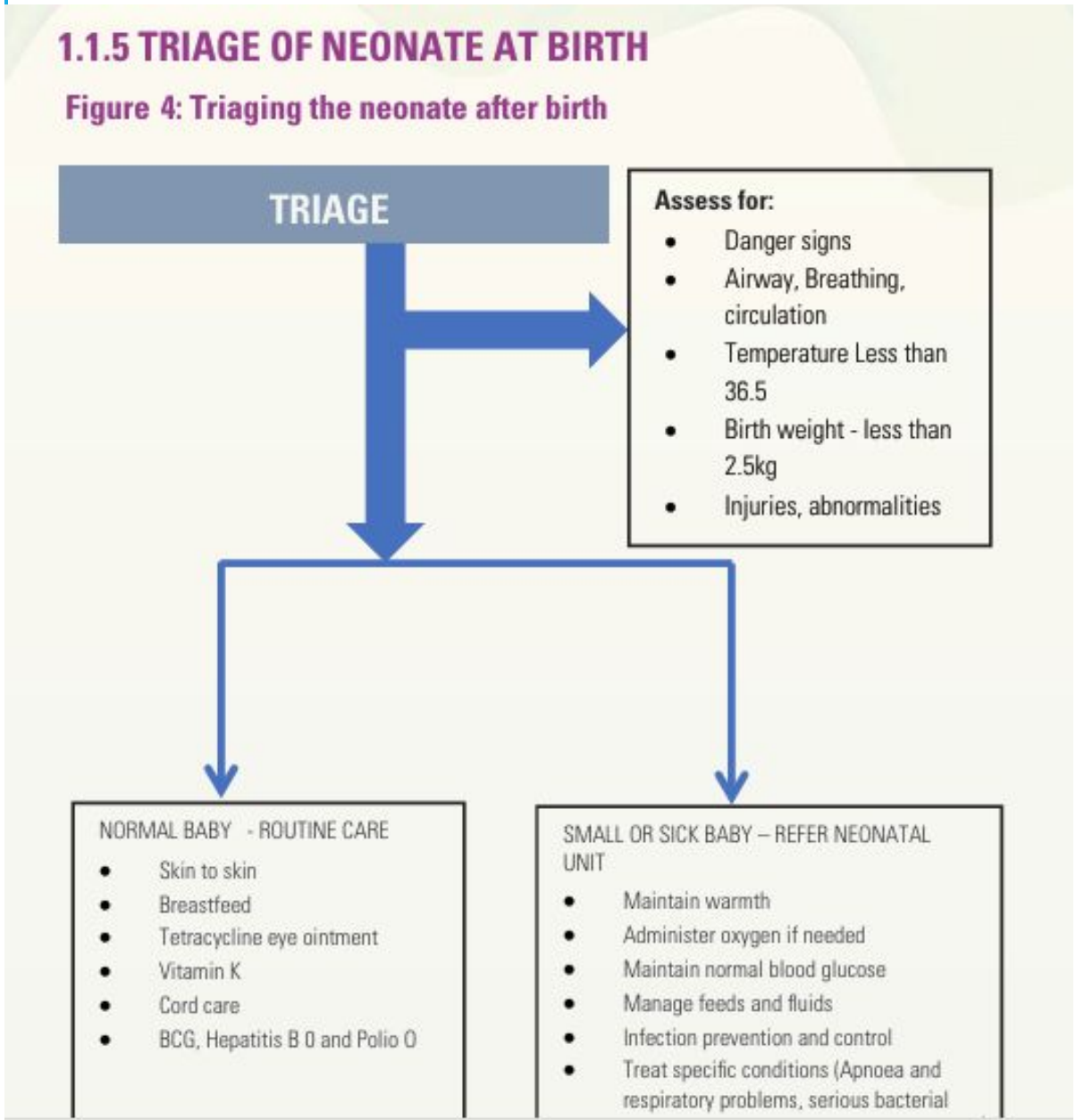
TRIAGE, CLINICAL PROTOCOLS FOR MANAGING SMALL AND SICK NEWBORNS, MOH 2023

A neonate who requires no resuscitation at birth is provided with the Essential Newborn Care

Figure 1: **Assessment of a neonate at birth**



TRIAGE- MOH UGANDA 2023



TRIAGE IN NEONATAL UNIT- MOH UGANDA, 2020

Table 1: Classify need for emergency care and ACT NOW

Not breathing at all **OR** Gasping **OR** Respiratory rate (RR) less than 20 breaths per minute **OR** Tongue is blue	Respiratory Failure	• Call for help • Resuscitate baby with Ambu bag • Give oxygen • Keep warm • Arrange for admission in the neonatal unit
Heart rate more than 180 beats per minute Pallor Extreme lethargy Unconscious	Circulatory Failure	• Call for help • Give Oxygen • Establish an IV line • Infuse Normal Saline 10ml/kg body weight over 1 hour • Then infuse 10% Dextrose at the recommended volume for weight/ age • Keep warm • Check vitamin K administration
Glucose < 2.5 mmol/l	Hypoglycaemia	• Give 10% Dextrose IV as per recommended volume for weight and age
Hypothermia Temperature <36.5^{0}C	Hypothermia	• Rewarm Hypothermic Babies • Rewarm Rapidly if there is severe Hypothermia (<32^{0}C)

GOALS OF NEWBORN ASSESSMENT

- Get baseline information about the baby eg weight, head circumference, passing meconium or urine
- Detect occasional ill or high risk baby that requires early treatment
- Reassurance about minor deviation from normal eg syndactyl, polydactyl, birth marks
- Evaluate developmental progress in response to NICU interventions and family-centered therapies
- Prognosticate longer-term neurodevelopmental outcomes
- Identify parents who may have difficulty caring for babies e.g first time mothers, sick mothers, substance abuse, mental illness, poor socioeconomic background eg housing
- To begin to provide health Education and any parental concerns eg breast feeding, baby safety

- Early diagnosis and intervention makes a whole difference in some babies eg congenital cataracts, urethral valves, talipes equinovarus, undescended testis

GOALS OF NEWBORN ASSESSMENT

- Yield of abnormal findings is high , about 20% having at least one anomaly (Adams and Hudgins 2003)
- Examination showed that only about 0.5% have at least 3 of such abnormalities
- Congenital abnormalities contribute to 240,000 new born deaths annually (WHO 2023)
- In Uganda 66.2 per 10,000 live births, more commonly hypospadias 66.2 per 10,000 live births, talipes equinovarus, neurotube defects
- *(A hospital based births defects surveillance system in Kampala, Daniel Mumpe-Mwanja et al 2019)*

WHEN SHOULD NEW BORN ASSESSMENT BE DONE

At birth

- Ascertain good transition to extrauterine life
- Exclude major abnormalities

A more detailed "head-to-toe" examination should take place within 24 hours of birth before baby is discharged

- We need to diffentiate the spot on examination at birth from the detailed head to toe examination

WHO SHOULD ASSESS NEWBORNS

- A trained medical worker
- Needs to have time to talk to the parents and address concerns- One study showed that mothers preferred midwives due to the time they take to talk to them
- A need to make sense of the findings (Tie up the findings)- Helps with management and counselling eg Ambiguous genitalia

WHAT YOU NEED

- Stethoscope
- Ophthalmoscope (trained health worker)
- Pencil torch (red reflex)
- Tape measure, infant scales, growth charts
- Pulse oximeter
- Transcutaneous bilirubin monitor
- Documentation
- Newborn Personal Health Record
- Medical record

CONSIDERATIONS

- Not a perfect screening tool
- Correct identification
- Introduce yourself
- Fully examine baby
- Head to toe, down the front and vise versa
- Do not wake baby up if sleeping
- Keep hip exam last

- Maternal medical, obstetric and social history from notes, mum and nursing staff
- Give advise and information. Arrange follow up, provide reassurance where appropriate
- Observation gives valuable information- may not need to do a CNS exam if good observation done eg tone , movements, reaction to stimuli

CONSIDERATIONS

Warm chain to prevent heat loss

- Conduct exam in a warm area away from draughts
- Use a radiant warmer or warming lamp
- Keep baby inside the incubator with the front panel closed

Avoid over stimulation and agitation

- Provide a quiet, calm environment
- Use gentle handling, provide rest breaks

IPC

- Good hand hygiene
- Clean equipment between patients

Family involvement-

- Consider cultural needs Discuss with parents: purpose, process, timing
- Ask about parental concerns
- Encourage participation
- Gain consent

HEAD TO TOE ASSESSMENT

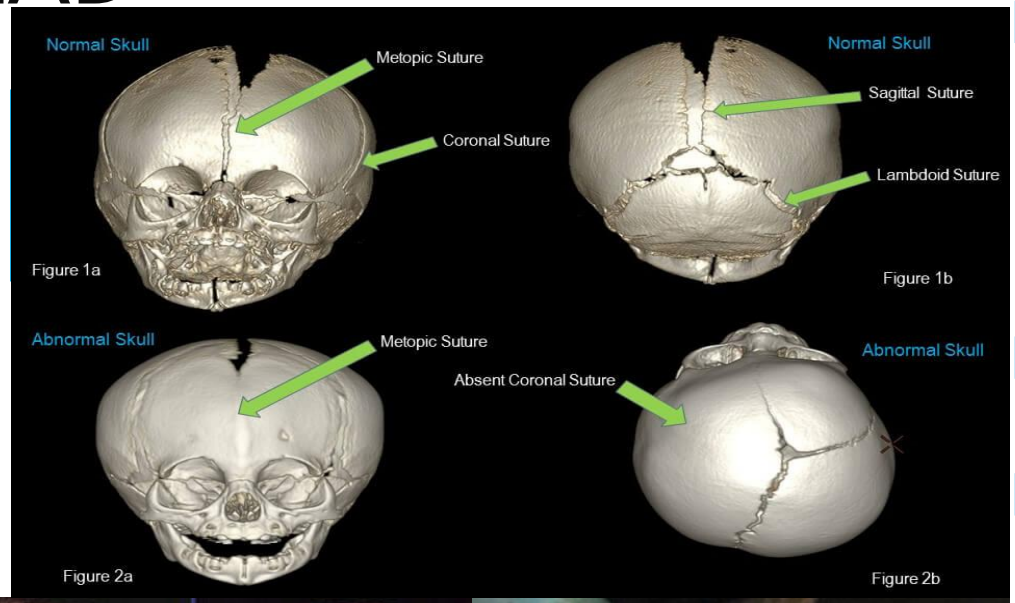
History

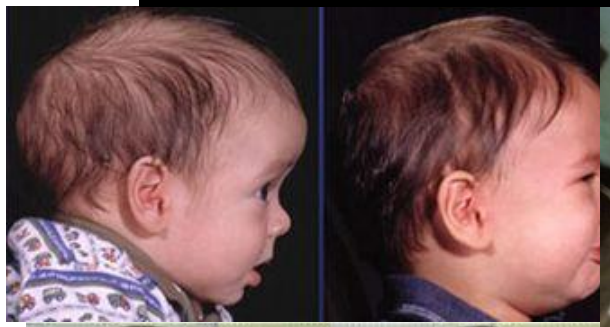
- Prenatal
- Pregnancy
- Maternal and paternal
- Gestational age- Best early obstetric ultrasound (15-19 weeks)
- Delivery
- Post Delivery

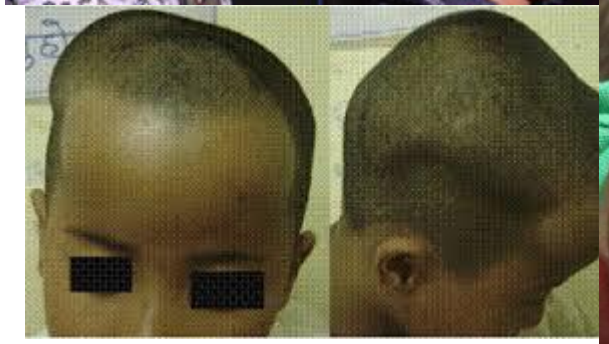
HEAD

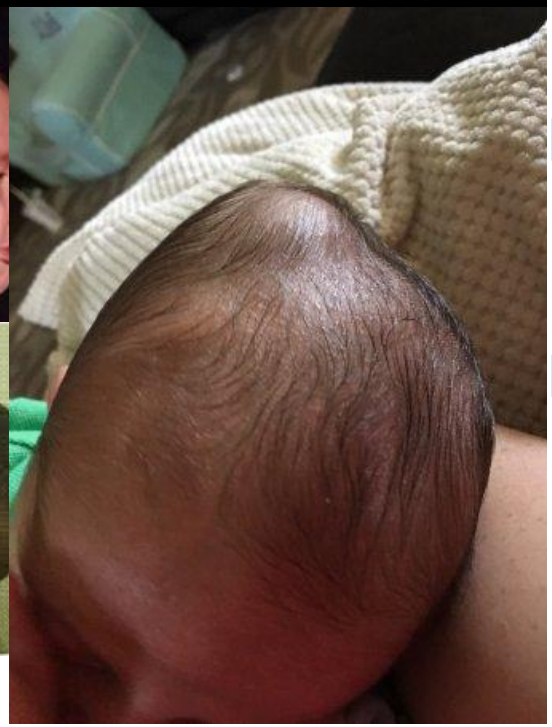
- Head can be distorted and moulded during labour and delivery
- Differentiate malformation from impact from mechanical forces e.g. caput seccedaneum, breech head (prominent occipital shelf)
- Anterior fontanelle, can be about 3cm by 3cm in largest diameters-look for any fullness or bulging
- Posterior fontanelle- usually a finger tip

HEAD



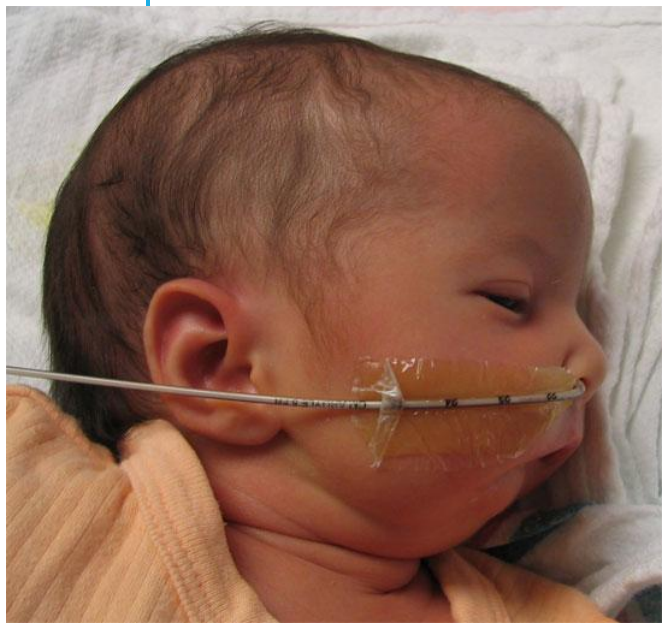


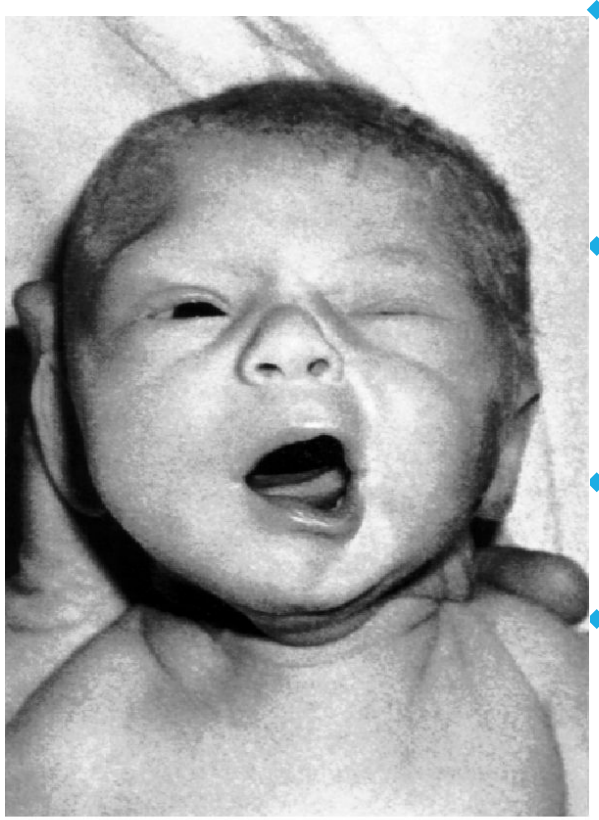




- Craniosynostosis-premature closure of sutures- may require neurosurgical intervention for cosmetic correction or allow brain growth
- Craniotabes
- Diffentiate benign swellings eg cephalohematomas from subgaleal hemorrhage
- Small head-can be isolated or due to congenital syndromes, congenital infections
- Large head- congenital megaencephaly, hydrocephalus

FACE



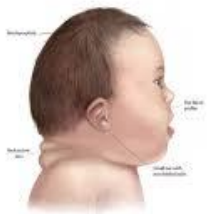


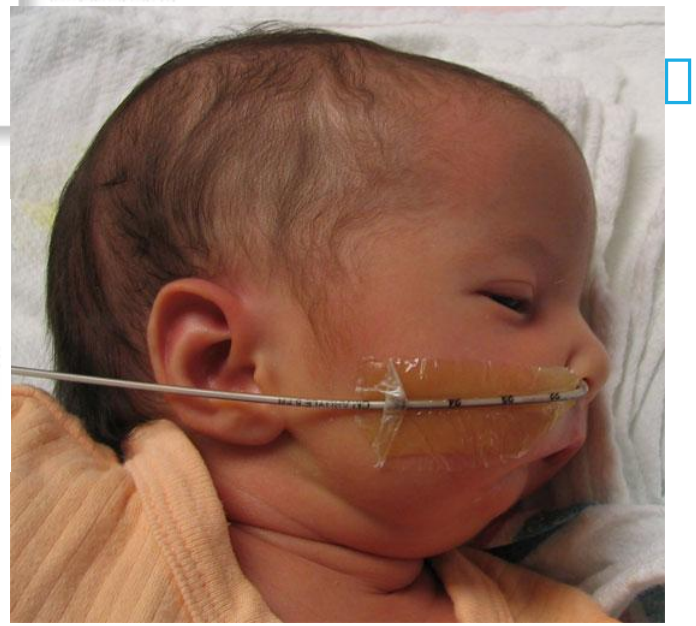
- Most newborn faces are unremarkable-may seem to resemble a parent
- Can be first clue to congenital abnormality, look for other associations
- If baby normal, no other abnormalities, glance at parents- can schedule a follow up
- Facial palsies
- Assymetric crying facies, in about 0.6-0.8% due to Absence or defect on Depressor Anguli oris muscle(DAOM)

EARS

Normally developed outer ear (pinna)

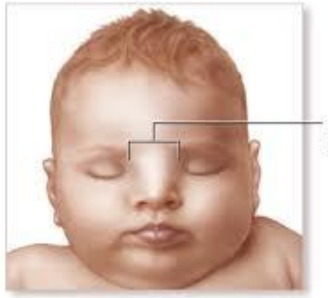
Abnormal size, shape, rotation and/or location of pinna

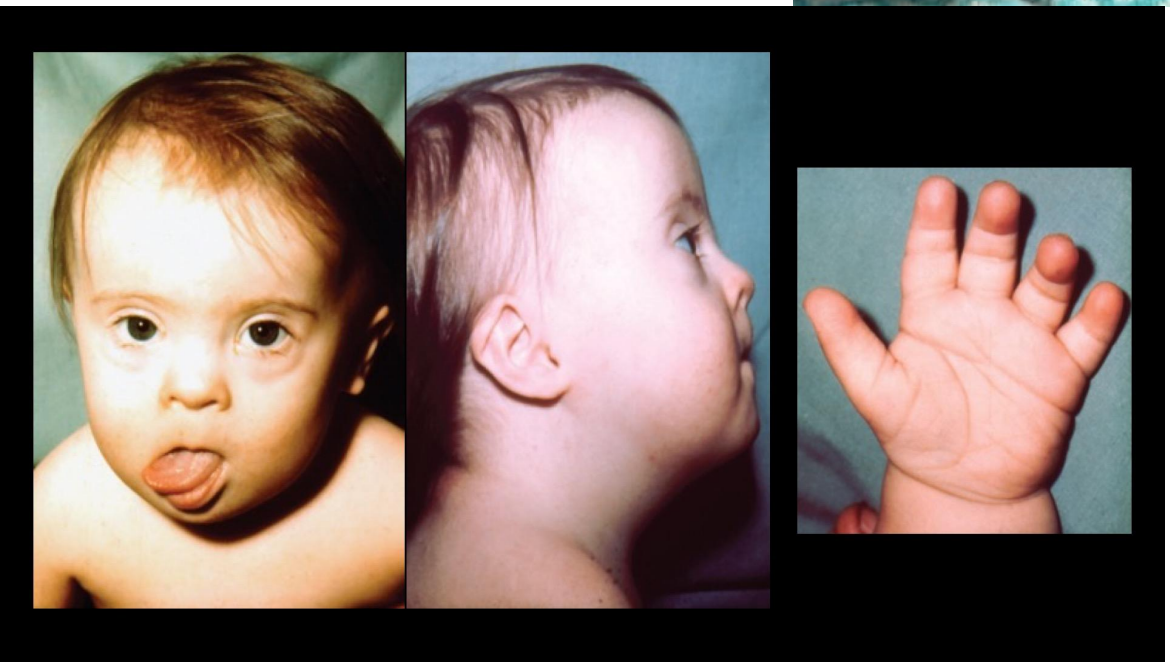




- Shape, size and position
- Low set ears characteristic with many syndromes- outer canthus at right angles to facial profile
- Abnormally large or small ears characteristic of syndromes

NOSE

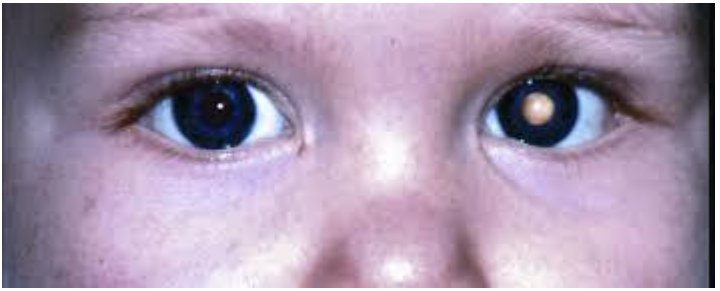


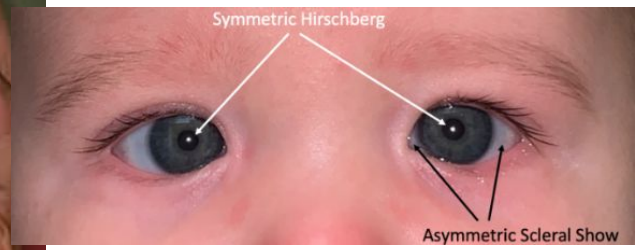


Inspection

- General shape and width of nasal bridge (inner canthal distance for term baby <2.5cm
- Squashed in intrauterine compression
- Septal cartilage- can be dislocated (columella deviation)
- Compression of nasal tip-deviation of nostrils-need treatment by ENT
- Flaring
- Complete nasal obstruction-failure to mist a mirror, with distress(Obligate nose breathers)
- Stuffy nose quite common
- Ensure patency of both nostrils if respiratory distress- fine catheter through each nose

EYES

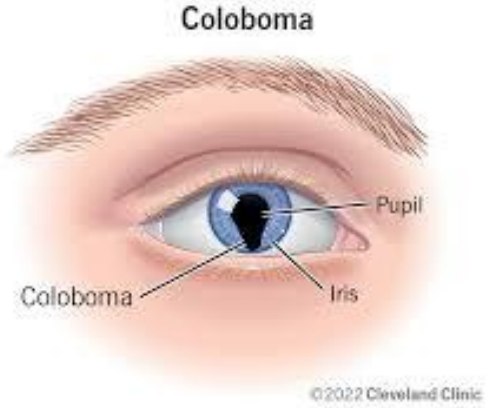


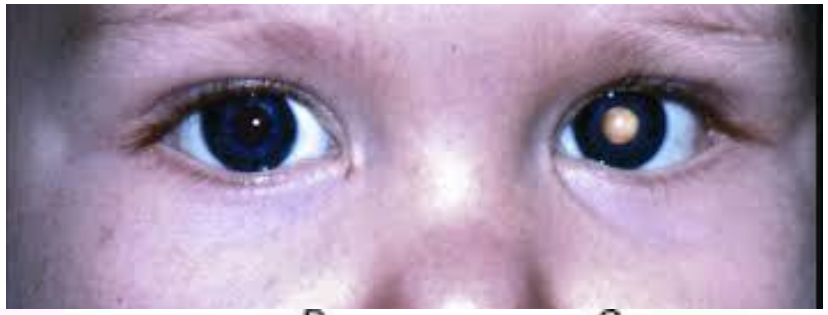


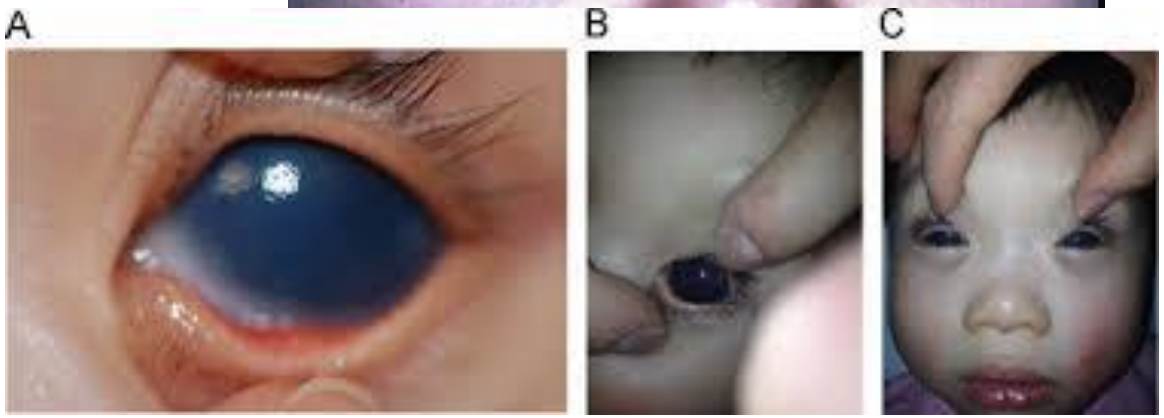
Inspection

- Size
- Dimensions and slant
- Strabismus or nystagmus
- Exotropia- normal and transient, Esotropia- abnormal
- Eye discharge- slight mucoid discharge common
- Purulent discharge- investigate for bacterial infection and treat
- Subconjuctival hemorrhaes – common
- Jaundice of sclera
- Occasional congenital obstruction of lacrimal gland, lead to dacrocystocele or dacrocystitis

EYES-IRIS AND CORNEA







Iris

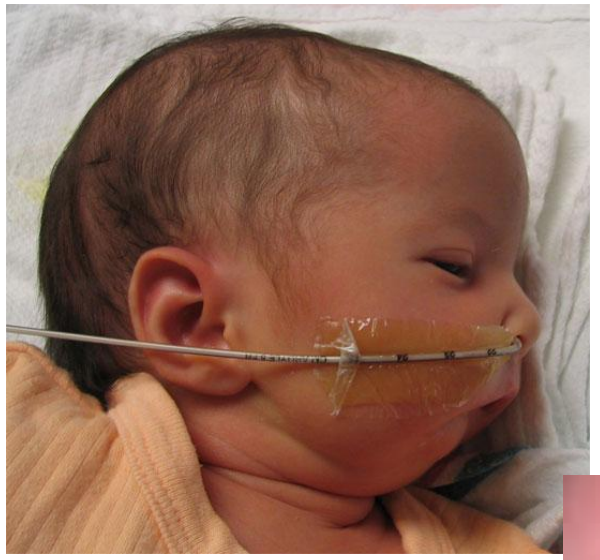
Blue or grey in newborn

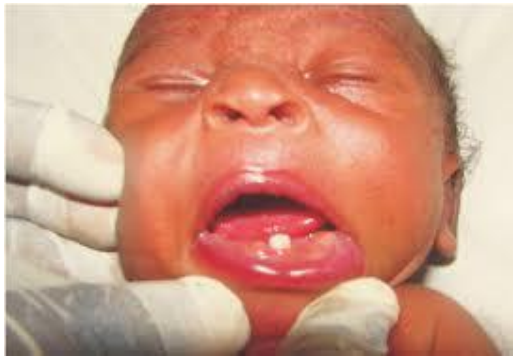
- Colobomas (key hole shaped pupil- look for congenital infections
- Aniridia (absence of iris, complete or partial)- poor vision

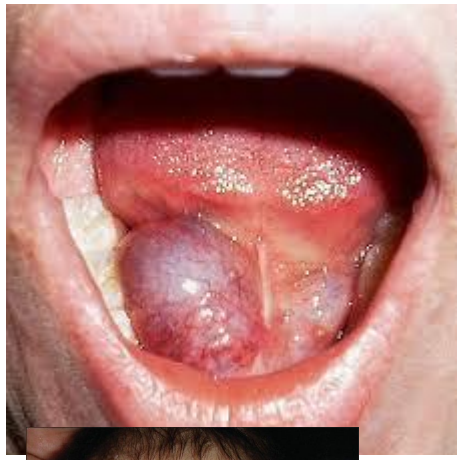
Cornea

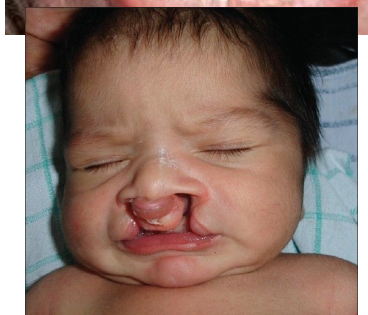
- Diameter about 10mm, if about 13mm, esp if hazy-congenital glaucoma
- Cataracts- bright light shone tangentially- red reflex, if present refer for fundoscopy

MOUTH









Normal size or micrognathia

Asymmetry of the mouth or nasolabial folds

Inspection-

Best done when baby is crying, pressing down chin, not safe to use tongue depressant

Inspect the palate, palpation not enough-Do not miss cleft in soft palate which will later be a feeding problem or nasal regurgitation

Minor variations from normal

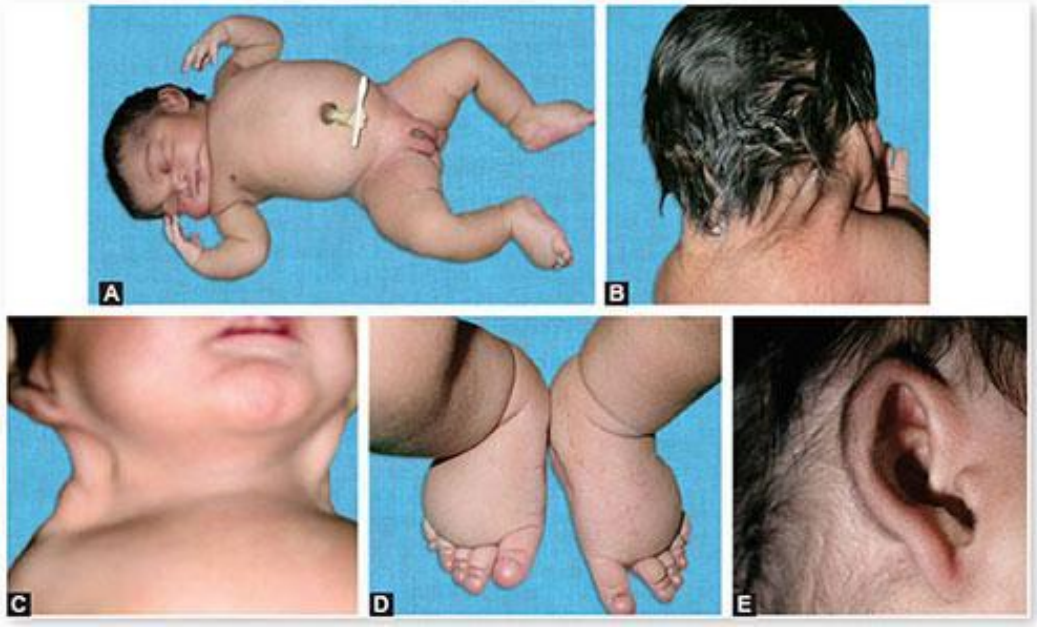
Epstein's pearls (white patches of microkerarosis on palate

Natal teeth- best removed especially if loose

Short frenulum or tongue tie(ankyloglossia)

Ranulae- bluish swellings due to mucus retention cysts-need no treatment

NECK



- Babies have relatively short neck

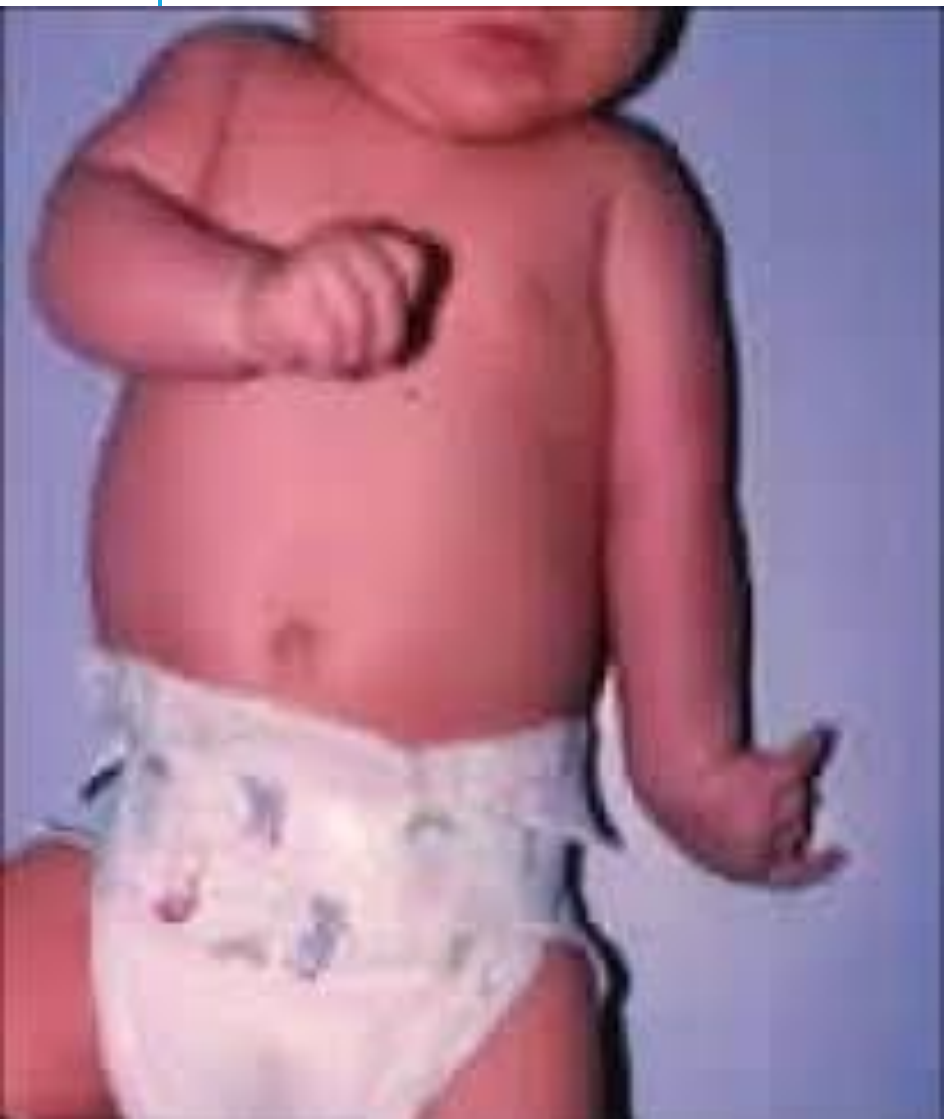
Inspection

- General shape
- Symmetry

Palpate for

- Lumps, swellings, movement
  - Webbed neck Turner syndrome
  - Very short webbed neck +/-Torticollis – abnormalities of cervical spine (Klippel –Feil syndrome)
  - Redundant skin posteriorly-Down syndrome
  - Cystic hygromas- Soft, fluctuant swellings arising in posterior triangle and can transilluminate

NECK



- Sternocleidomastoid tumors- lesions in sternocleidomastoid caused by hemorrhage or ischaemia leading to secondary fibrosis
- Palpate clavicle for fractures especially in setting of Erb's palsy or shoulder dystocia

CHEST AND CARDIORESPIRATORY SYSTEM

- Antenatal screening may not detect most Congenital Heart disease
- Babies still delivered with cyanosis, shock, murmur
- Neonatal check may fail to detect over half of CHD (Wren et al.1999, Ainsworth et al 1999, Lee et al 2001)
- Inspection of chest
- Breast swelling –quite normal unless inflamed, mum may need assurance
- Cyanosis- If in doubt, use pulse oximeter
- Observe respiratory rate
- Signs of respiratory distress
- Syndromic baby
- Respiratory pattern, Is there apnea-common in preterm

CHEST AND CARDIORESPIRATORY SYSTEM

Peripheral pulses –bounding for significant left to right shunt in PDA

Peripheral pulses- absent of hard to feel, coarctation of aorta (20% difference in upper and lower limb BPs)

Heart murmurs

Innocent murmurs- Grade 1-2/6, no clicks, normal pulses, normal clinical exam-PDA or tricuspid regurgitation

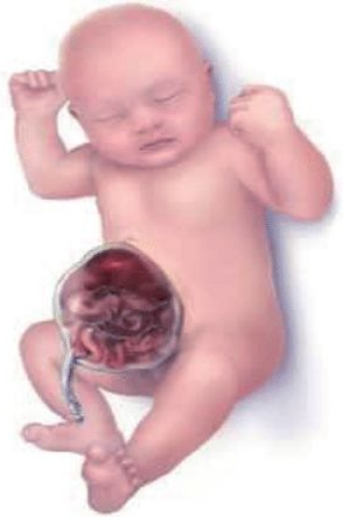
Significant murmurs(McCrindle et al, 1996)

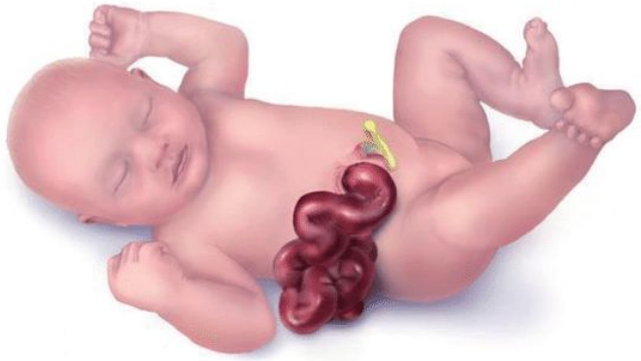
- Pansystolic
- Grade 3/6 and above
- Best in LUSB
- Harsh quality
- Abnormal or second heart sound
- Early or mid systolic click

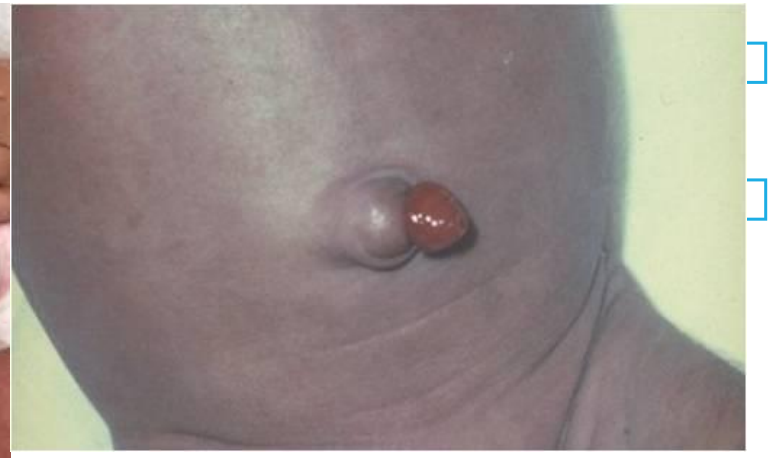
Do Echocardiography or chest x ray to differentiate

Counsel parents as mention of hole in heart causes great anxiety- most resolve spontaneously by 1 year >80%

ABDOMEN







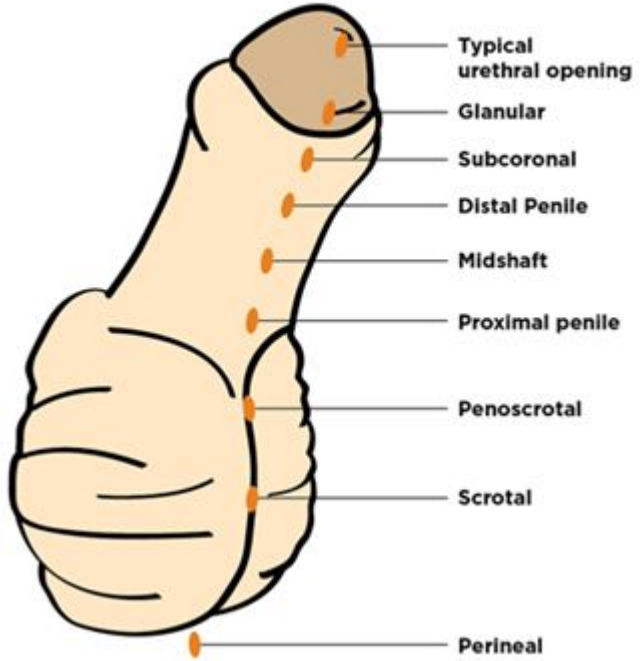
- Major abdominal wall defect are usually seen prenatally on scans or at initial assessment after delivery
- Inspection gives valuable information

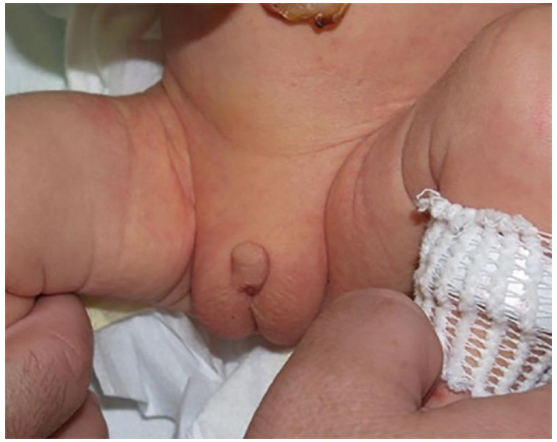
Inspect for

- Discharge or reddening of skin around umbilicus
- State of umbilical stump
- Umbilical granulomas- after cord has fallen off, umbilicus not reepithelised completely, easily bleed, caused by proliferation of endothelial cells
- Persistent urachus- discharge urine
- Umbilical polyp Remnant of vitelline duct

SKIN

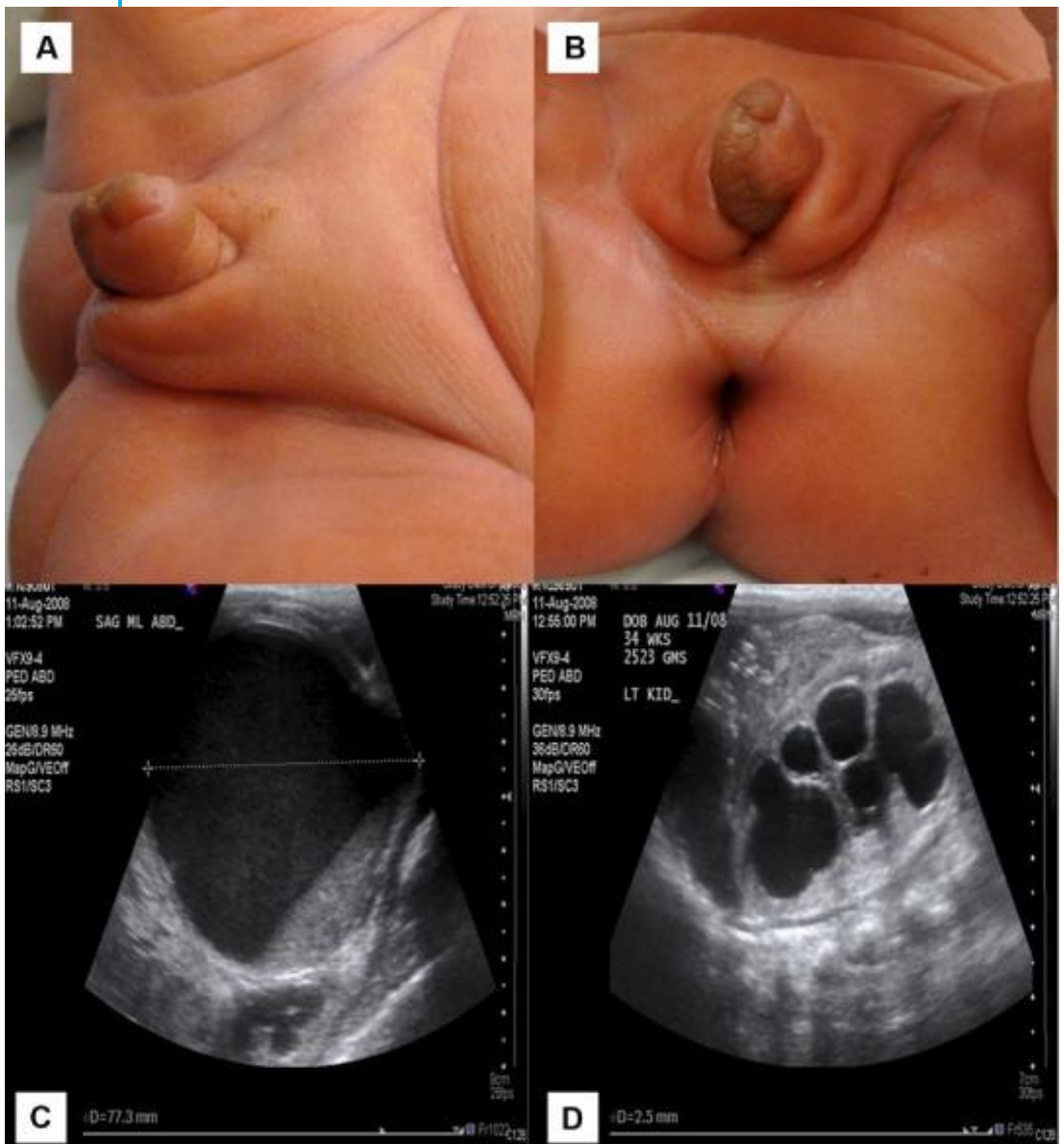
GENITALS-MALE





- Penile length about 3cm
- True micropenis rare- Congenital hypopituitarism
- Position of urethral meatus-hypospadias, discourage circumcision as foreskin can be used for corrective surgery
- Shaft of penis for curvature-compressing can show latent chordae- uro consult
- Poor stream – meatal stenosis
- Dribbling of urine, urethral valves
- Scrotum- Descended?- Need early treatment- infertility and testicular cancers
- Hydroceles- usually spontaneously resolve
- Hernias? Warn for signs of strangulation- paed surgery review at discharge

GENITALS -FEMALE



- Vaginal discharge- mucoid, bloody- normal
- Mucoid cysts resolve
- Ambiguity
- Anal position

SPINE

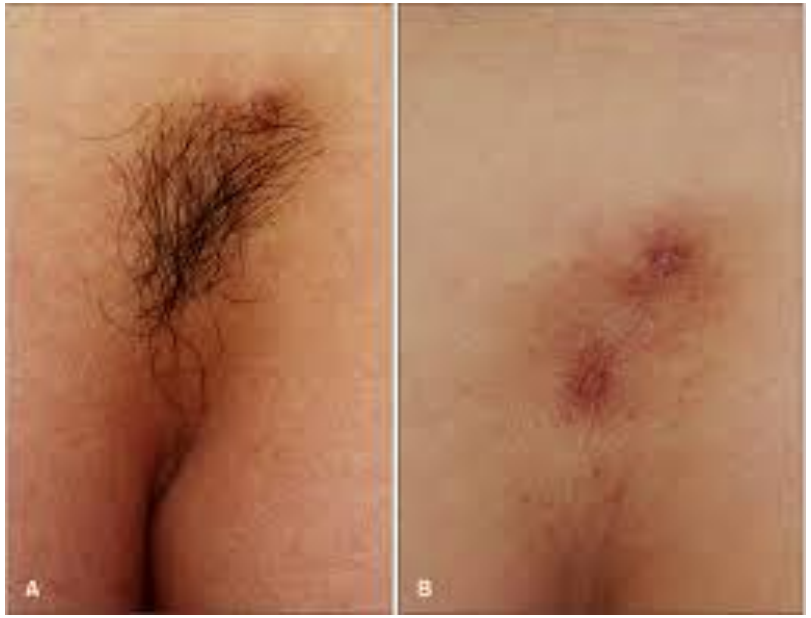
Obvious curvature

Midline abnormality

Swelling

Dimple- some benign-ultrasound can give valuable information

Hair tuft



UPPER LIMBS

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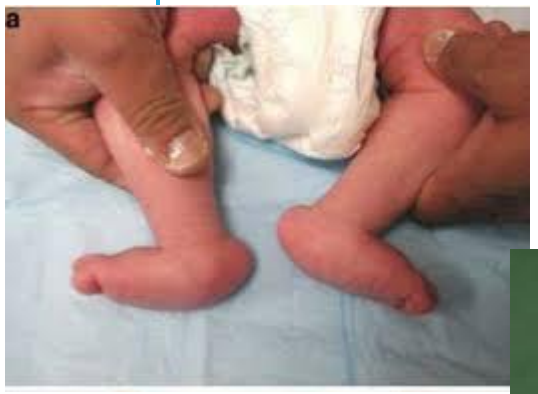
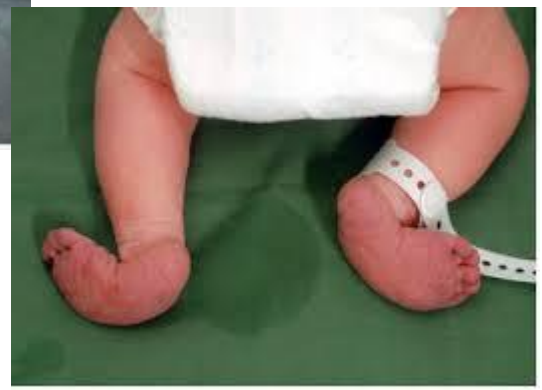
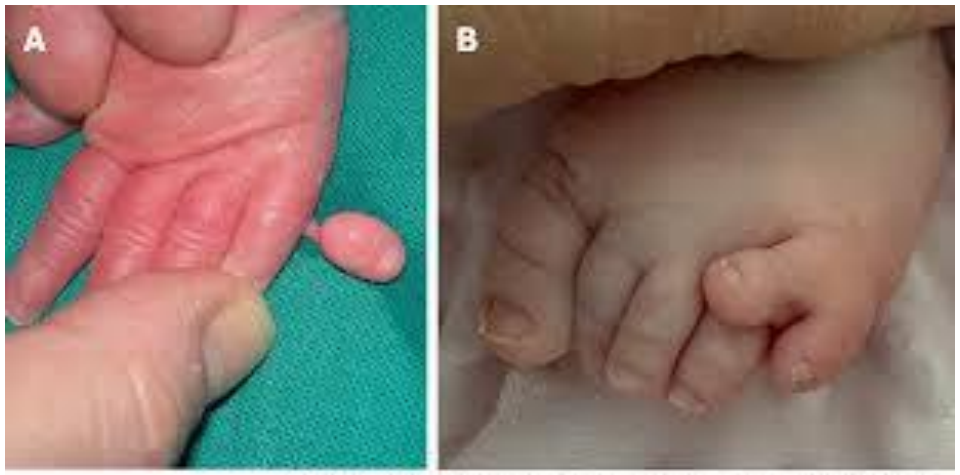
- Inspect for shape, posture, symmetry, size
- Palmer creases- look for other symptoms, normal in other populations
- Polydactyl- usually familial
- Observe spontaneous hand movement- for palsies refer

LOWER LIMBS







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Inspection

Legs, feet and hips for posture, symmetry, size, deformities

Feet- dysmorphism eg rocker bottom feet and short hallux in Edwards , puffy and hypoplastic nails- Turner

Talipes equinovarus- orthopedic correction

In turning of forefoot (simple metatarsus adductus- usually spontaneously resolve

Syndactyl, overriding toes- familial

Explain the nature and natural history of minor deformities

HIPS

- Screen for congenital dislocation of hip (Developmental dysplasia of hips)
- Treatment in neonatal period leads to normal hip
- Risk factors for DDH- Do Hip ultrasound scan
- Abnormal clinical exam
- First degree relatives with childhood hip issues
- Breech after 36 weeks
- Other risks like talipes, oligohydramnios, torticollis
- Ortolani-Barlow Manoevers- difficult to describe, baby hippy available for demonstration

GENERAL CONSIDERATIONS

Behaviural state- Most term infants have quiet and active sleep

Posture- Flexed

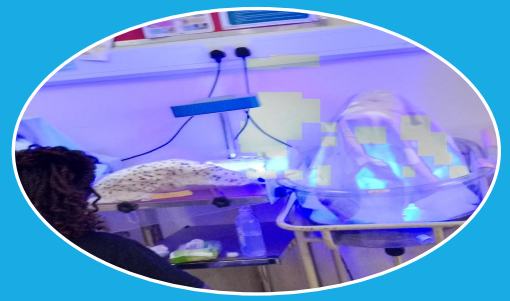
Spontaneous motor activity- can be used to examine tone and strength

Crying- look for excessive crying, high pitched, very weak cry

Feeding and suckling patterns got from history, can observe feeding

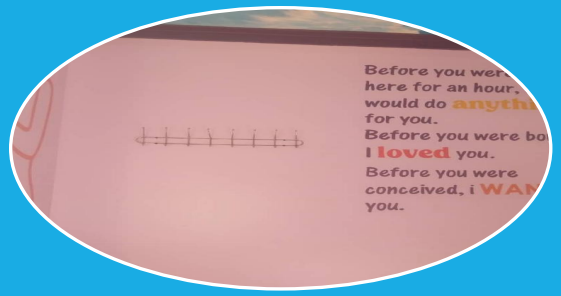
Be ready to offer health education- gives parents greater reassurance and satisfaction eg jaundice, cot death prevention, breast feeding, danger signs, hygiene

CONCLUSION



Neonatal assessment needs to be done routinely

Make sense of findings



Be ready to educate parents , manage or plan for referral

RECOMMENDATIONS

Hospital policies and protocols

training

Partnerships

RECOMMENDATIONS

Infection Prevention and Control

- General IPC measures
- Antibiotic stewardship

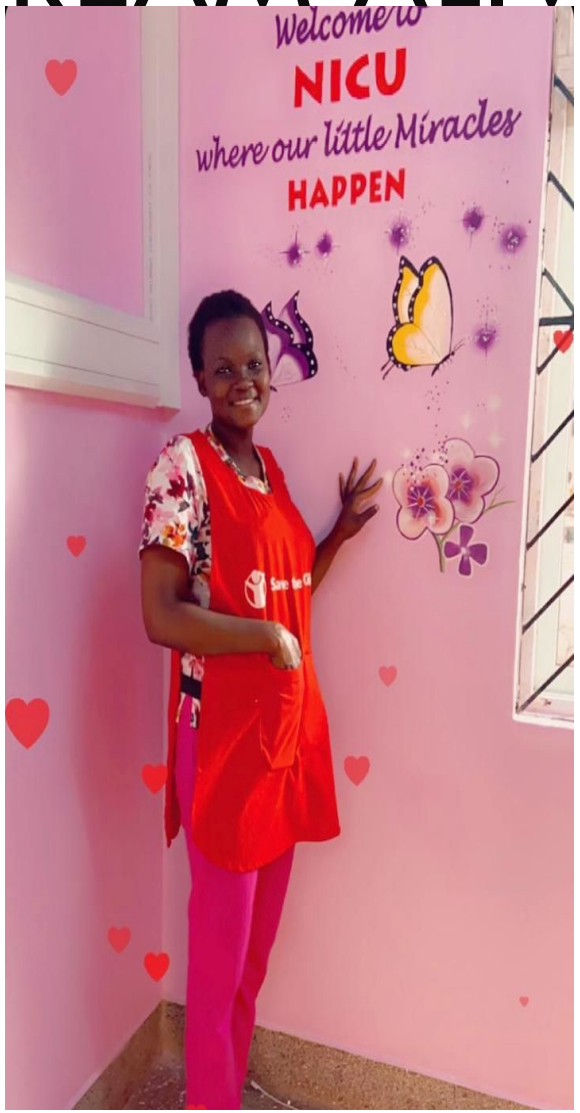
Improved Skills on neonatal transport

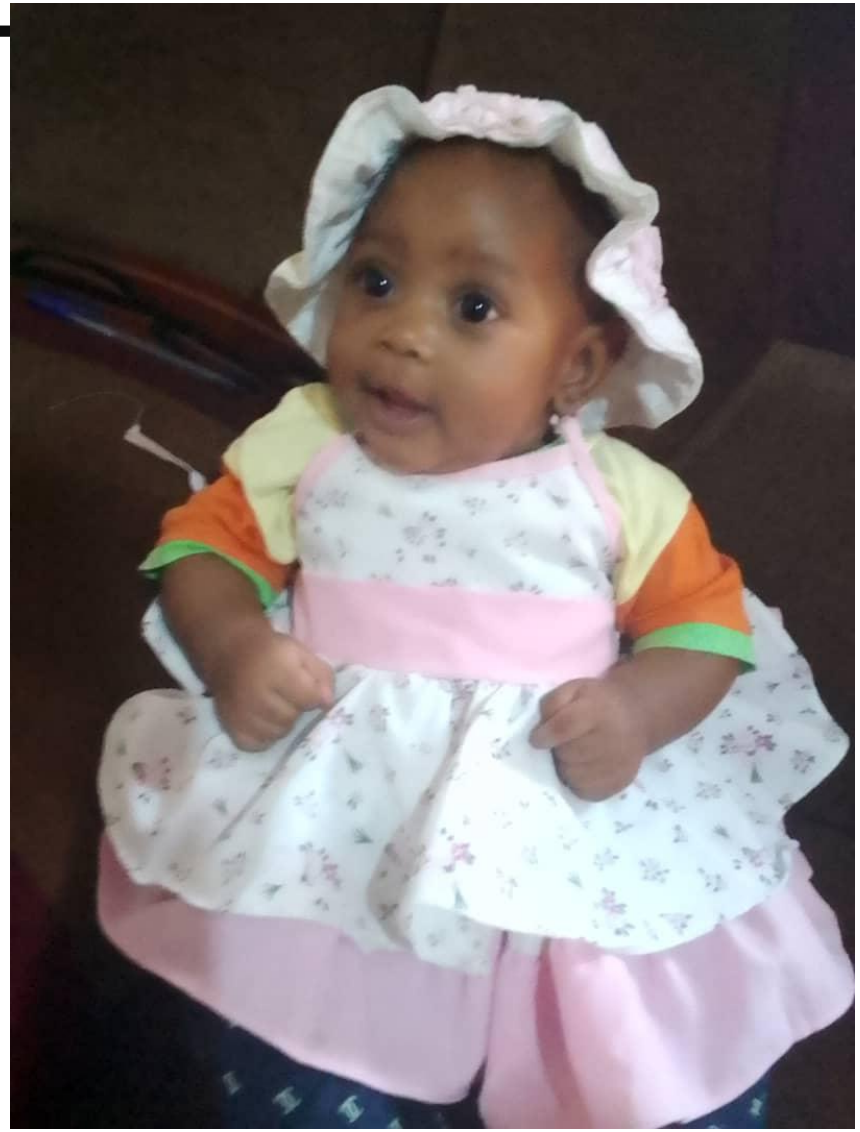
- Stabilization before transport
- Transport skills, prevention of physiological stressors
- Intrauterine transport whenever possible

Quality assurance

- Management-Clinical governace
- Follow up on matters arising
- Audit recommendations follow up

KEEP HER DREAM ALIVE





REFERENCES