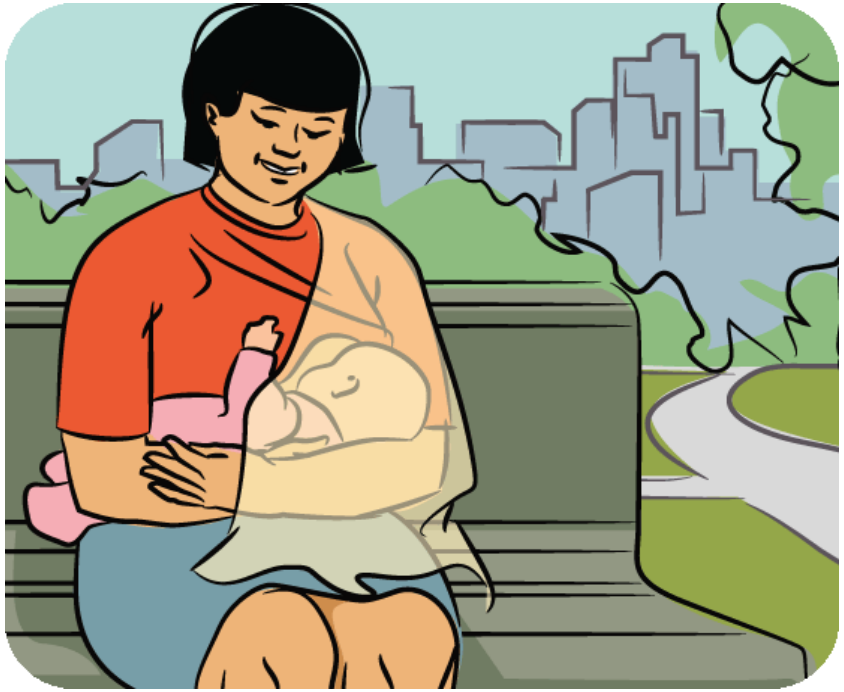
Well Newborn Care



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Fifth year 24-25

Primary Reference:
Attached in e learning module

Care of well newborn reference

1. Benitz WE, Committee on Fetus and Newborn. AAP Policy Statement – Hospital Stay for Healthy Term Newborns. Pediatrics. 2015;135(5): 948-953.
https://pediatrics.aappublications.org/content/135/5/948

2 Lancet series on breast feeding

https://www.thelancet.com/series/breastfeeding

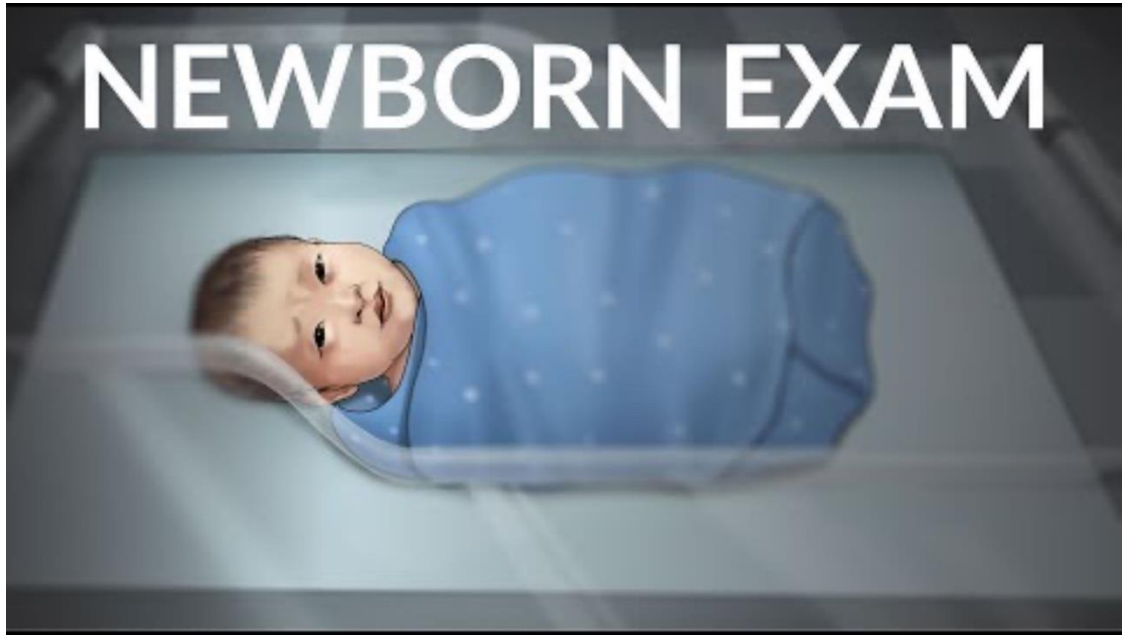
3. Videos. For breast Feeding support to mothers
https://globalhealthmedia.org/language/arabic/?_sft_topic=breastfeeding

Newborn exam

- LINK. 15 minutes each

https://www.youtube.com/watch?v=cracmPo3iYo

https://www.youtube.com/watch?v=rW3ABQ4S6pQ



References for newborn exam

Module

https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/child-health-and-wellbeing/newborn%20exam.pdf

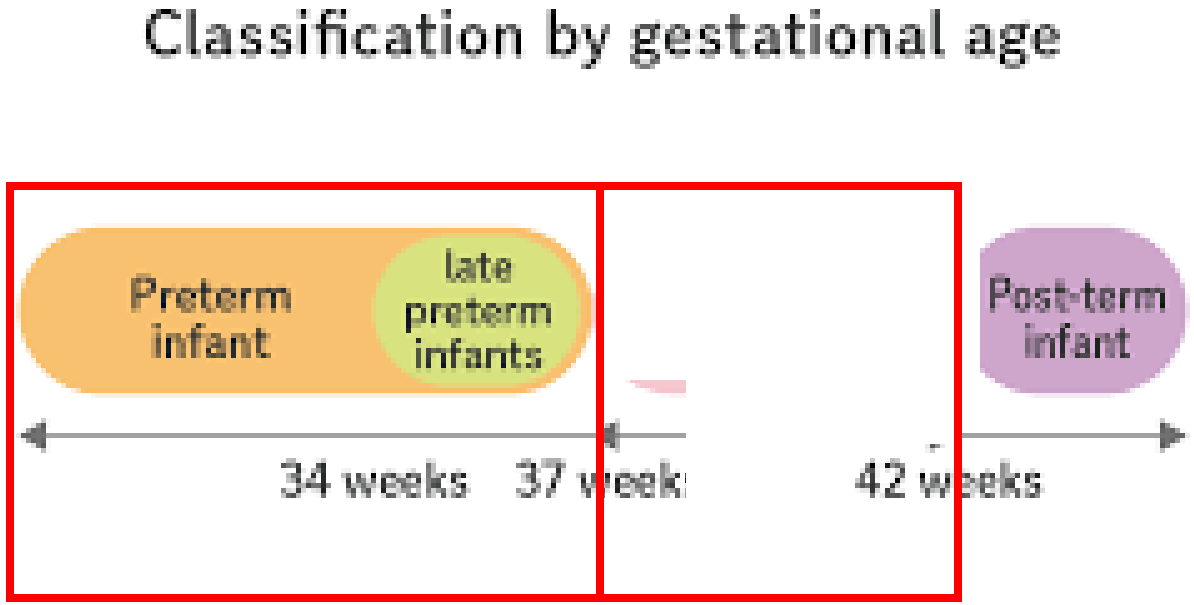
Well newborn care intended learning outcomes

- **Learning Objectives**
  - Delivery room care
    - DELAY CORD CLAMPING IN TERM AND LATE PRETERM
    - Maintain Normal temperature
    - Describe Abgar Score
    - Understand when the baby needs to be assessed
  - Understand Voiding and stooling Pattern
  - Understand the risks for hemorrhagic disease of newborn , and outline anticipatory guidance that may be preventive
  - Identify the most common benign newborn problems after birth delineate appropriate guidance
  - Identify types of mandatory neonatal screen
  - SIDs

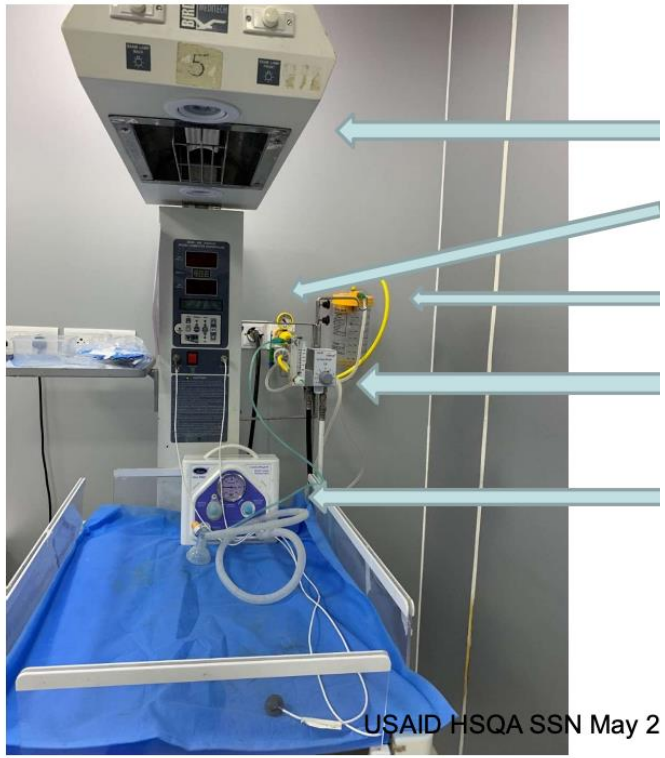
Category	Gestation (weeks)
1. Extremely preterm	Under 28
2. Very preterm	28 to under 32
3. Moderate preterm	32 to under 37
a) Early moderate preterm	32 to under 34
b) Late moderate preterm	34 to under 37

Table 2: Categories of preterm birth

Figure 2



ne Delivery Room / OR



Plan for the Golden Hour

Antenatal consultation for high-risk pregnancies (before the mother comes in for delivery)

Examples

- Maternal conditions: von- Willebrand disease, SLE, Cancer
- Fetal conditions: Twin to twin transfusion, Rh hemolytic disease of the newborn, fetal cardiac malformation, congenital diaphragmatic hernia, gastroschisis, open neural tube defects

Consult other specialists ahead of delivery

Plan mode and time of delivery

Plan actions at time of delivery

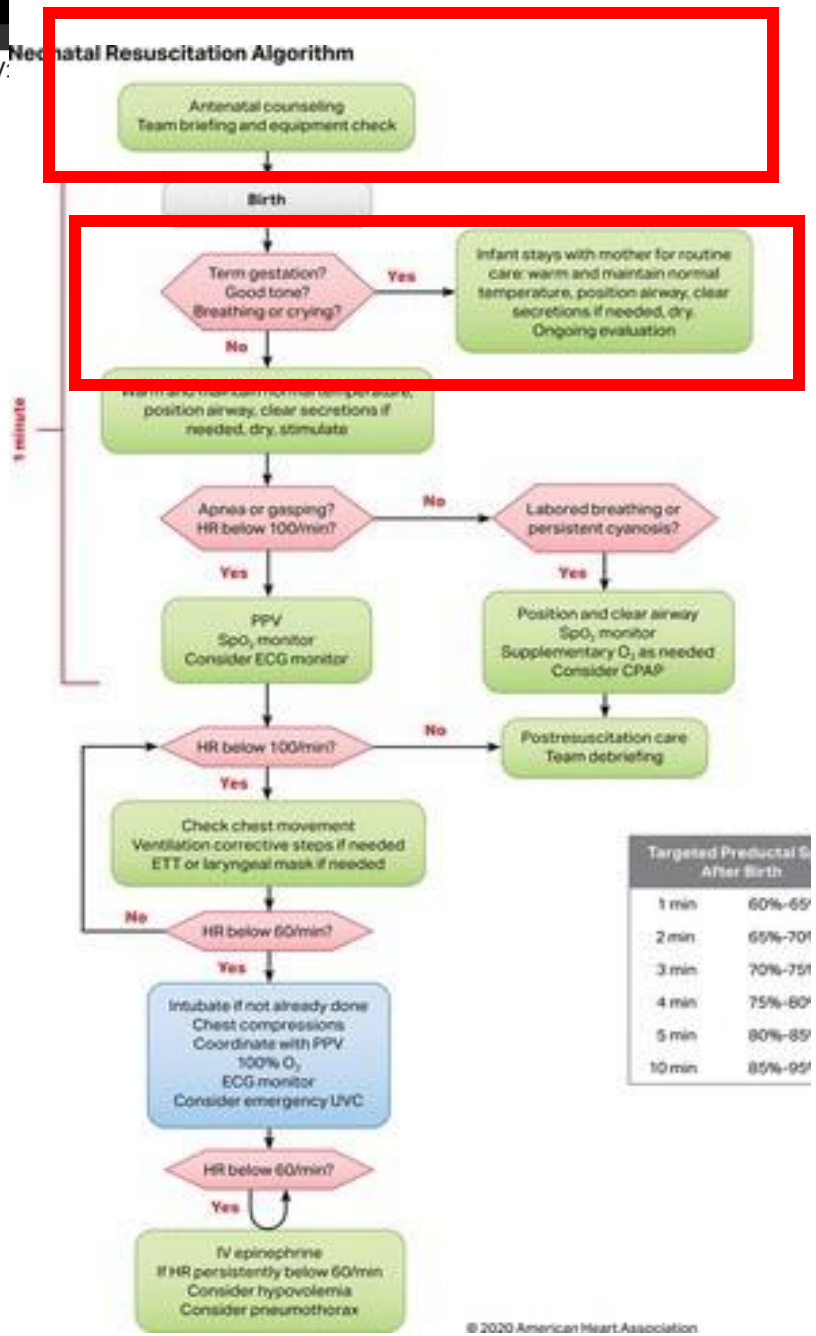
Have written plans available at time of delivery

Communication between OB and NICU

when high risk conditions are noted on admission of patient for delivery or monitoring to Labor Ward

- Preterm labor or premature rupture of membranes
- Multiple gestation
- Known fetal anomaly
- Other complications of pregnancy- preeclampsia, gestational diabetes, intrauterine growth restriction, Rh isoimmunization
- Other medical conditions in mother
- Bleeding- placenta previa or abruption

What is your hospital's plan for this communication?



Delay cord clamping

Cord blood is the blood that remains in the umbilical cord after birth.

It contains red blood cells (that can carry oxygen), WBC, IMMUNE CELLS nutrients, and stem cells.

Stem cells replenish cells in blood, skin and organs

If cord clamping occurs 10–15 seconds after birth, 67% of the umbilical cord blood goes to the infant. By 1 minute of age, the amount of cord blood in the placenta passed to the infant increases to 80%.(79-80 ml)

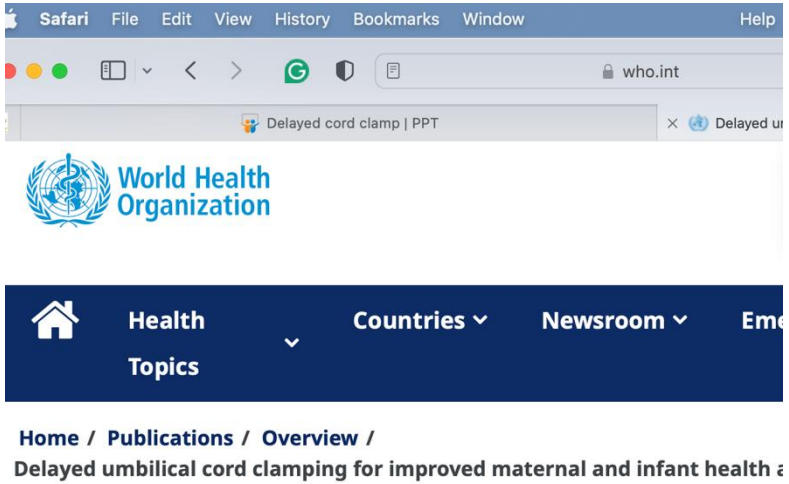
What medical societies recommend for Delayed Cord Clamping:

Society	Year Issued	Delay (Mins)
ACNM: American College Nurse Midwives	2014	2 - 5
WHO: World Health Organization	2014	1 - 3
RCOG: Royal College of Obstetricians and Gynaecologists	2015	1
SOGC: Society of Obstetricians and Gynaecologists of Canada	2015	0.5
FOGSI: Federation of Obstetric and Gynaecological Societies of India	2016	Not stated
ACOG: American College of Obstetricians and Gynecologists [Officially endorsed by ACNM]	2020	0.5 - 1
FIGO: Federation International Gynaecology & Obstetrics, working group for pre-term birth < 34 weeks	2021	0.5
ILCOR: International Liaison Committee on Resuscitation, review 42 RCT to form policy for premies < 34 weeks	2021	No proof!

Delay cord clamping

Delayed Cord Clamping: Delivery Room Management (AAP/NRP & ACOG)

- For vigorous term and preterm infants, cord clamping should be delayed for 30 – 60 seconds
- Infant placed skin-to-skin, wrapped, and warmed – begin initial steps of newborn care
- Contraindications: bleeding from placental abruption /previa or cord avulsion
- Unclear benefits in multiple gestations, IUGR, abnormal placentation, and nonvigorous newborn
- Delivery plan made with OB and Neonatal teams

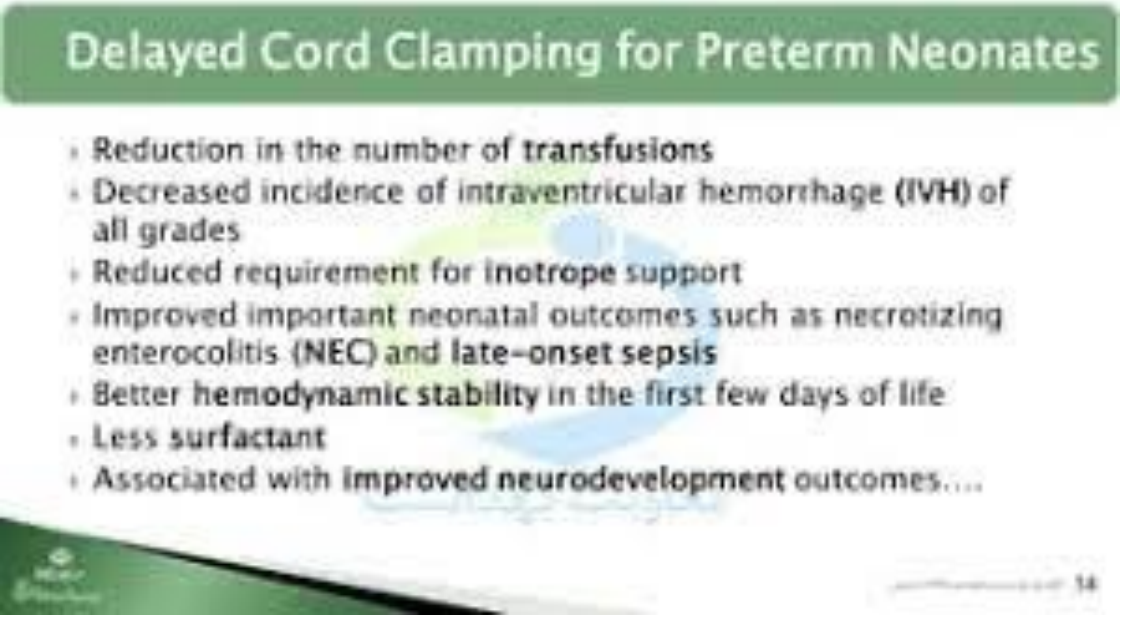


WHO: Cord pulseless

At least 1-3- min

- Delay cord clamping

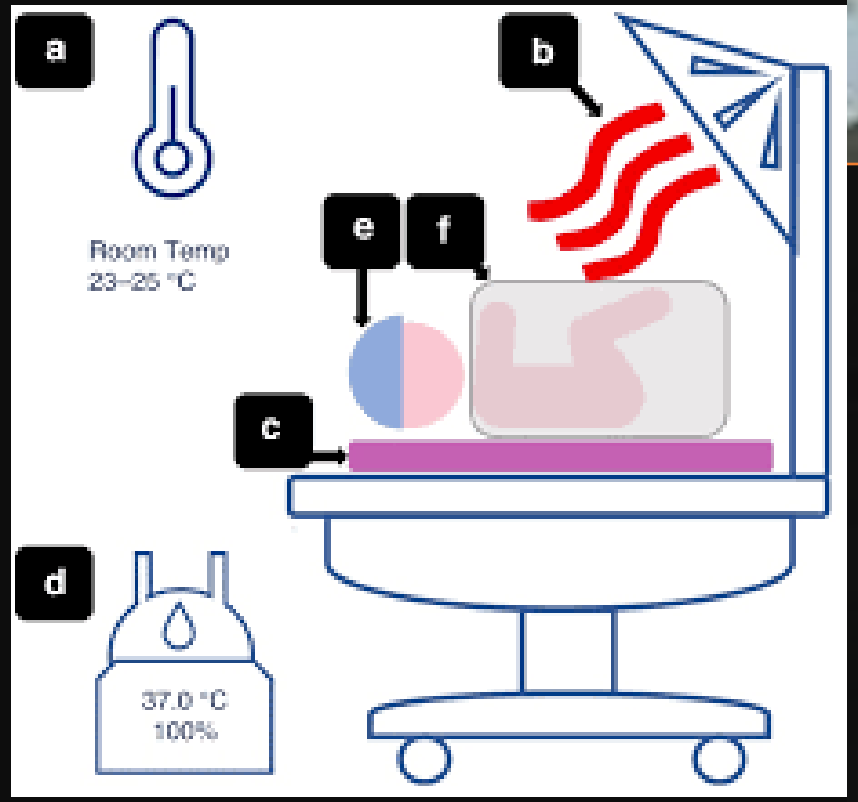
Benefit



The Benefits to the Infant of Delayed Cord Clamping

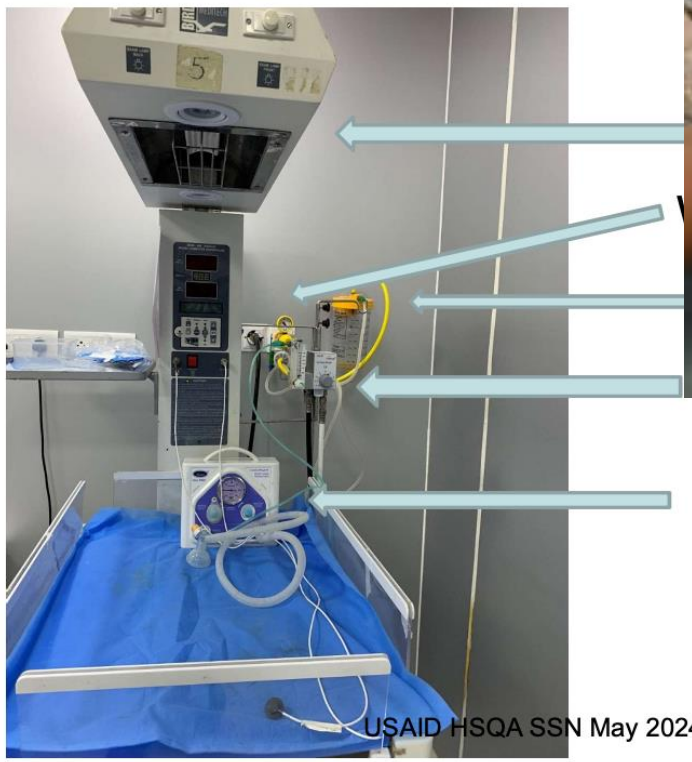
- **Increased iron stores at birth and less infant anaemia:** Studies show a 61% reduction in the rate of anaemia requiring blood transfusion when delayed cord clamping is practiced.[7]
- **Decreased intraventricular haemorrhage:** Studies show a 59% reduction in the rate of intraventricular haemorrhage in preterm infants when delayed cord clamping is practiced.[7]
- **Less necrotizing enterocolitis:** Studies show a 62% reduction in the rate of necrotizing enterocolitis among preterm babies when delayed cord clamping is practiced.[7]
- **Less infant sepsis:** Studies show a 29% reduction in the rate of neonatal sepsis for preterm infants when delayed cord clamping is practiced.[7]
- **Fewer blood transfusions needed:** Studies show a 52% reduction in the rate of blood transfusions for low blood pressure among preterm babies when delayed cord clamping is practiced.[7]

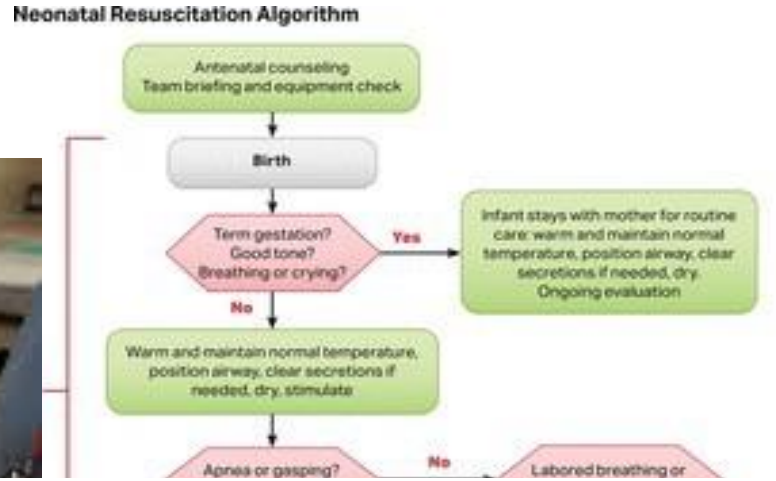
Thermal care in DR

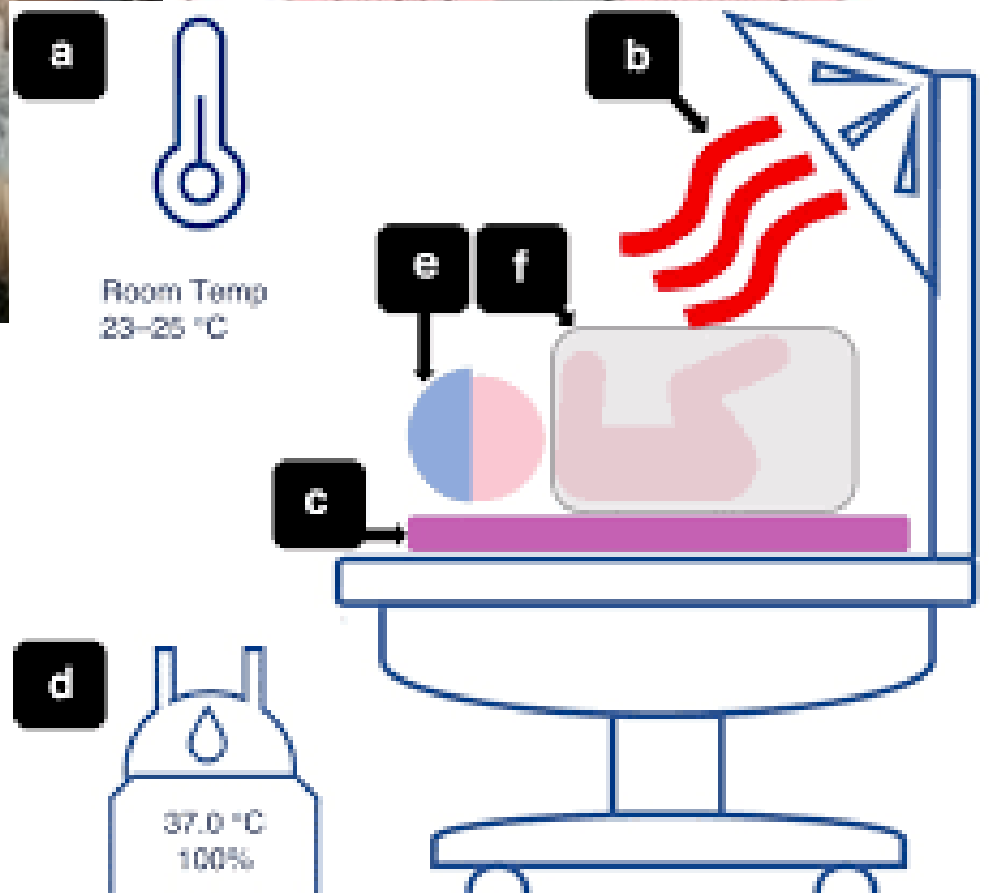


Temperature management:
dry and warm

ne Delivery Room / OR







Maintain Normal Temperature
Between 36.5–37.5°C after birth

If term, good tone, breathing:

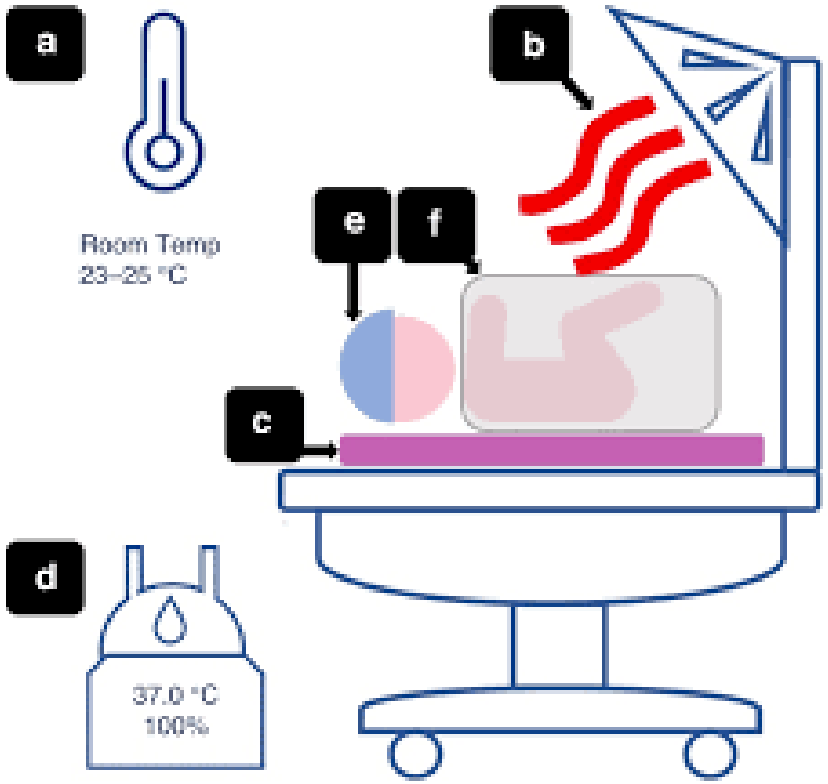
Drying

Skin to skin

Breastfeeding

Hat

If resuscitation is needed:



Maintenance of temperature:

- Immediately dry the infant under a radiant warmer
- Skin to skin contact with the mother.
- Keep neonates head covered.
- Rooming in (The baby should not be separated from the mother)

WARMTH

-is provided by keeping the baby **dry** & wrapping the baby with adequate clothing in two layers, ensuring the head & extremities are well covered.

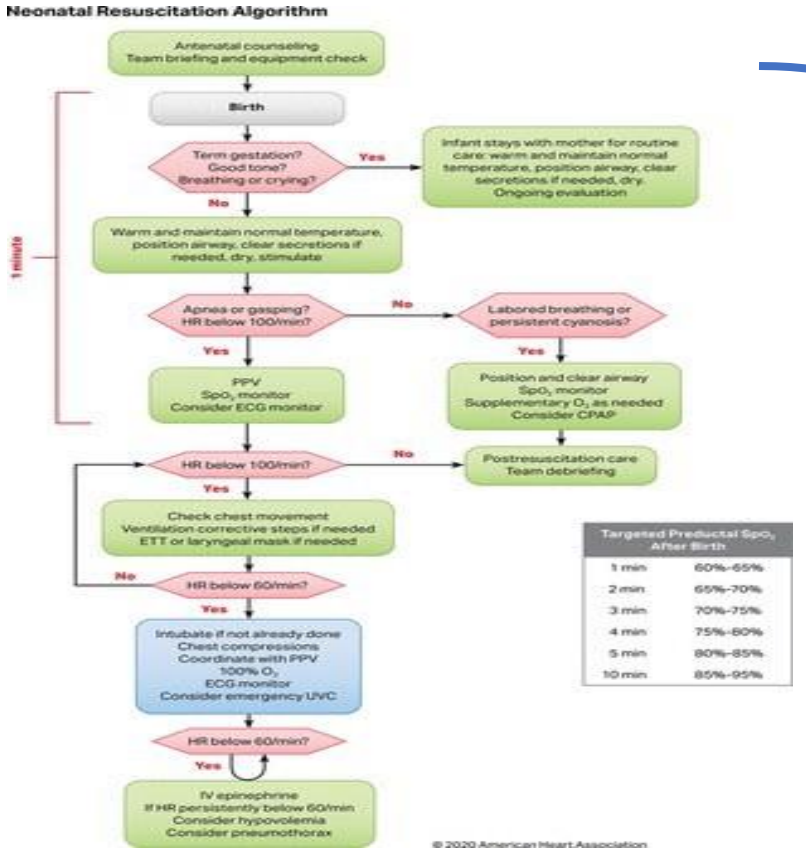
Apgar Score

At 1. @ 5 minutes of age

PARAMETER	0	1	2
Heart Rate	Absent	<100	>100
Respiratory Effort	Absent	Irregular, slow	Good, strong cry
Muscle Tone	Limp	Some flexion of extremities	Well flexed
Reflex Irritability	No response	Grimace	Cry, Sneezes
Color	Blue, Pale	Body pink, extremities blue	Completely pink.

Table 1. The Apgar Score

The Apgar Score	0	1	2
Heart rate	Absent	<100 beats per min	>100 beats per min
Respiratory effort	Absent	Weak cry; hypoventilation	Good cry
Muscle tone	Flaccid	Some flexion	Active motion/Well flexed
Reflex irritability	No response	Grimace	Cry/Cough/Sneeze
Color	Blue/Pale	Acrocyanotic	Completely pink



Neonatal resuscitation steps 2020

- A 5-minute Apgar score of 7 to 10 is considered normal.
- Apgar scores can be helpful **in assessing an infant's transition** from intrauterine to extrauterine life
- It may reflect neonatal resuscitation efforts
- It t **should not guide** these resuscitation efforts.
- Apgar scores should **not be used to predict** neurologic outcomes or development of infants

CASE

Prenatal visit

Q1. What are the 2 steps applied in the delivery room to support this Mom to breastfeed her baby?

Delivery room management of well term newborn

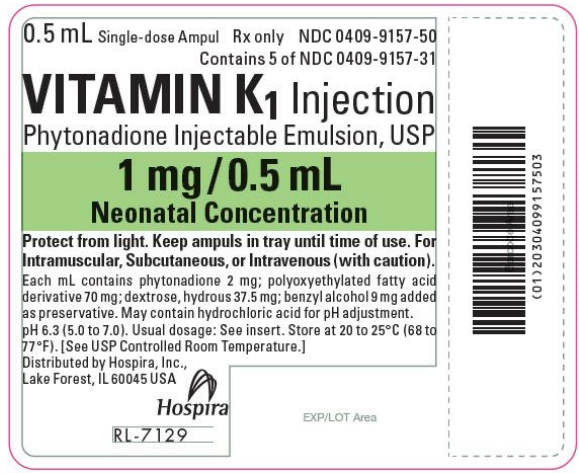
First do **skin-to-skin** contact to maintain his or her temperature (30-60min)

Breast feeding initiation

- The infant should be encouraged **to breastfeed** as soon **as possible and within the first hour of birth**

Q2. What information do you need to give the parents to convince them that vitamin K injection must be given in the first hour after birth?

Vitamin K



- Vitamin K is an important clotting factor synthesized by intestinal bacteria.
- Since 1961 (universal prophylactic)
- All neonates are born with low levels of vitamin K because of:
  - ►the immature of gut flora (the amount of vitamin K synthesized from their flora is insufficient.
  - ►low levels of transplacental passage
  - ►inability of the fetal liver to store vitamin K.
  - ►Human breast milk is a poor source of vitamin K
- **Vitamin K–deficiency bleeding (VKDB)**
  - directly after birth first 24 hours, or first week (classic VKDB day1 to day 7)
  - or many weeks later (1-12 weeks) Late VKDB
- PRESENT AS.
  - (Vitamin K–deficient bleeding)
    - presenting as skin bruising, mucosal bleeding, bleeding at the umbilicus and circumcision site, or even fatal intracranial hemorrhage. Large hematomas at injection sites or on the head after delivery also may be presenting signs.

Vitamin K

- Maternal risk factors for the infant's development of vitamin K–deficient bleeding include:
  - antiepileptic, ant tuberculin, and other vitamin K antagonist medications.
    - Infants born to mothers taking anticonvulsant (e.g., phenytoin, barbiturates, carbamazepine) or antituberculosis medication (e.g., rifampin, isoniazid)
    - Present first day

- Vitamin K given to all babies after delivery in an intramuscular injection has been shown to prevent both early and late forms of bleeding.

Newborn Identification:

Newborn Identification Before a baby leaves the delivery area, identification bracelets with identical numbers are placed on the baby and mother. Babies often have two, on the wrist and ankle.

Initial newborn assessment

The parents are concerned about their baby,

when can you reassure them about their baby's condition after birth ? .

Q3- When is the initial newborn assessment done?

The initial newborn assessment

- It Include a **thorough examination** of the infant after birth :
- Asses if:
  - Resuscitation is needed
  - Gestation age and birth weight
  - Apgar score
  - any anomalies and i**dentification** of infant
  - maternal **risk factors** necessitating further evaluation

- When. IMMEDIATELY AFTER DELIVERY

- Who -Typically is performed by a labor and delivery nurse or the birth attendant for **low-risk deliveries**.

  - For **higher-risk deliveries**, a specialized neonatal resuscitation team may be present at the delivery and perform this assessment.

After normal delivery of her healthy male baby, the mother was in good condition.

She did skin to skin contact to with her baby immediately after birth, and started to breast fed her baby in the first hour of his life.

She asked you if her baby can stay with her in her own room in the obstetric floor.

You were also excited since the hospital is baby friendly

Q4-How do you support breast feeding during her stay?

Support Breast feeding during Stay

- Answer: Do room In policy (Baby stays with his mother)
- **Breastfeeding Information** should be given to the family
  - GIVE parents **postnatally** clear and unbiased information
    - Regarding **the benefi**ts of breastfeeding for both mother and infant
    - Dextrose water and sterile water are to be **avoided**
    - Individual education in:
      - **breastfeeding skill**
      - as well as the **assessment** and **management** of breastfeeding **problems**
      - This should be readily available **during** hospitalization and after discharge (Post discharge feeding counseling).
- Mothers who are **unable to breastfeed** their infants
  - should have **access to high-quality breast pumps** and providers skilled in lactation.

Q 5. When is the pediatric clinician's examination completed?

- The pediatric clinician's examination is completed in the first 24 -48 hours after birth.

What to do at time of exam?

Look at the nurse's assessment (it is complementary)

- Nurses often assess the infant fully before this examination, and their evaluations should be viewed as complementary.

- The initial examination serves the purpose of:
  - Identifying further risk factors through history and physical exam
  - Identifying anomalies
  - Reassuring parents about the health of their new infant.
  - Education, sometimes termed "**discharge teaching**,"
  - Identifies and discusses common findings.
    - as safe sleep positioning, skin and cord care, jaundice,
    - As voiding patterns common to the newborn.

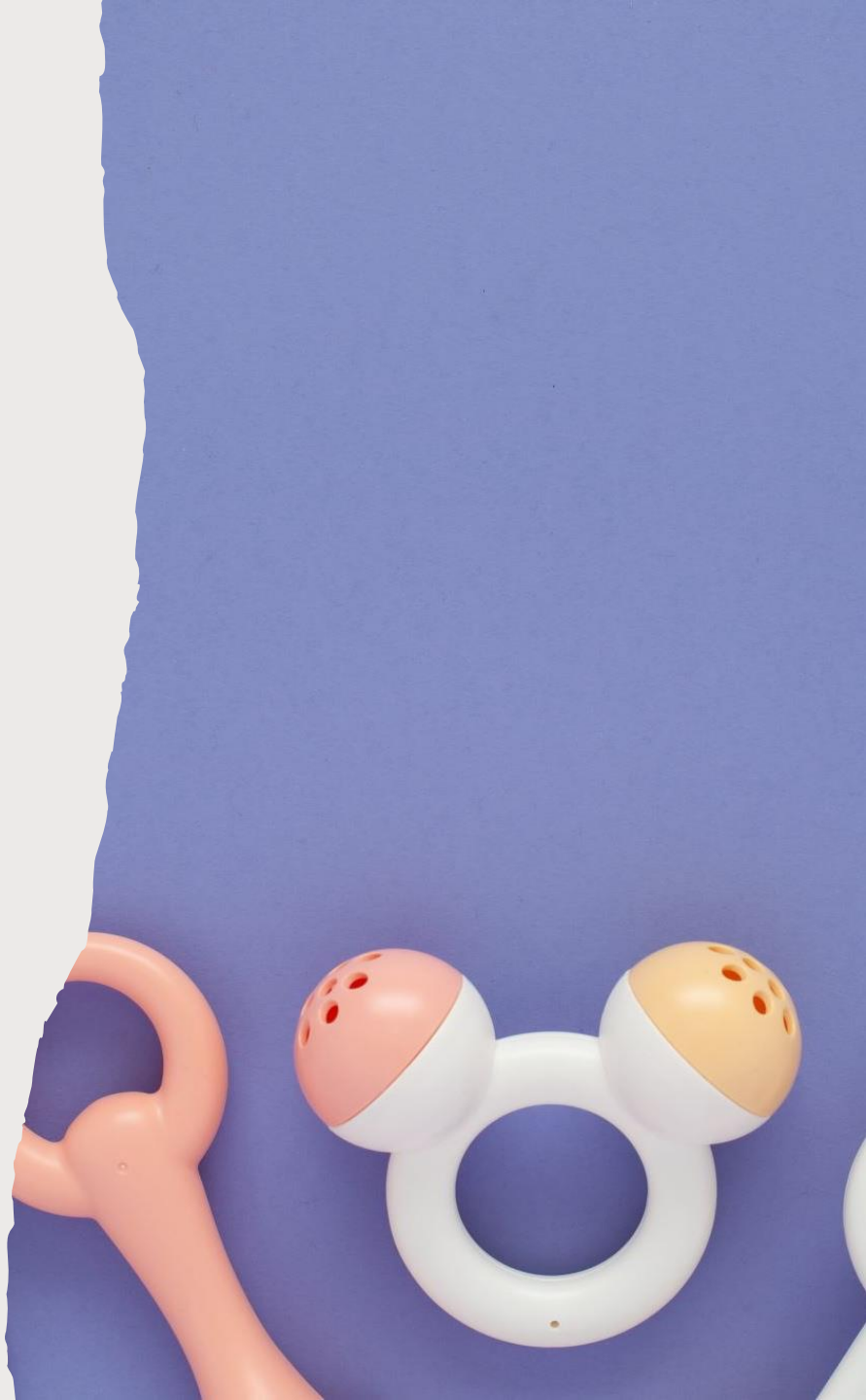
The TEN STEPS to Successful Breastfeeding

World Health Organization

unicef

DAILY ROUTINE CARE OF NEONATES

- The majority of complications of the normal newborn may occur during the first 24 -48 hours (discharge after 48 hour
- So close observation & daily essential routine care is important for health & survival of the newborn baby.



Before discharge

- Q 5.1 When the pediatric clinician's examination is completed before discharge
- Q5.2 What is required prior to discharge?

▶ Take history

You Asked about the main points needed to be in the history that include:

- Prenatal and antenatal history:
  - Maternal age, method of pregnancy,
  - Maternal diseases before and during pregnancy (UTI, PET , DM
  - Mother blood group and hepatitis B status
  - Maternal screen (first, second and third)
  - Fetal condition during obstetric follow up
  - Maternal medications before and during pregnancy and during labor
  - Maternal family and social history
  - Previous pregnancies history and birth outcome
- Social history (level of education, living, smoking ,working status etc.…)
- Delivery history including:
  - Method of delivery and gestation age and birth weight
  - Maternal medication during labor
  - Resuscitation history for the baby and any problems -during delivery
- What happened to mother or the baby. (Abgar score)

Do the second exam at 24 -48 hours of age

Now, you are planning to meet a couple who have just had their first male baby. They are a friendly young couple who are very excited about their new son

Ideally, a second exam should be completed in the first 24-48 hours after birth **(preferable with parents' attendance**
(first was the initial assessment done immediately after birth)

Q7: How do you address these parental concerns regarding growth and gestation age assessment?

Q 7.1 How do you assess gestational age

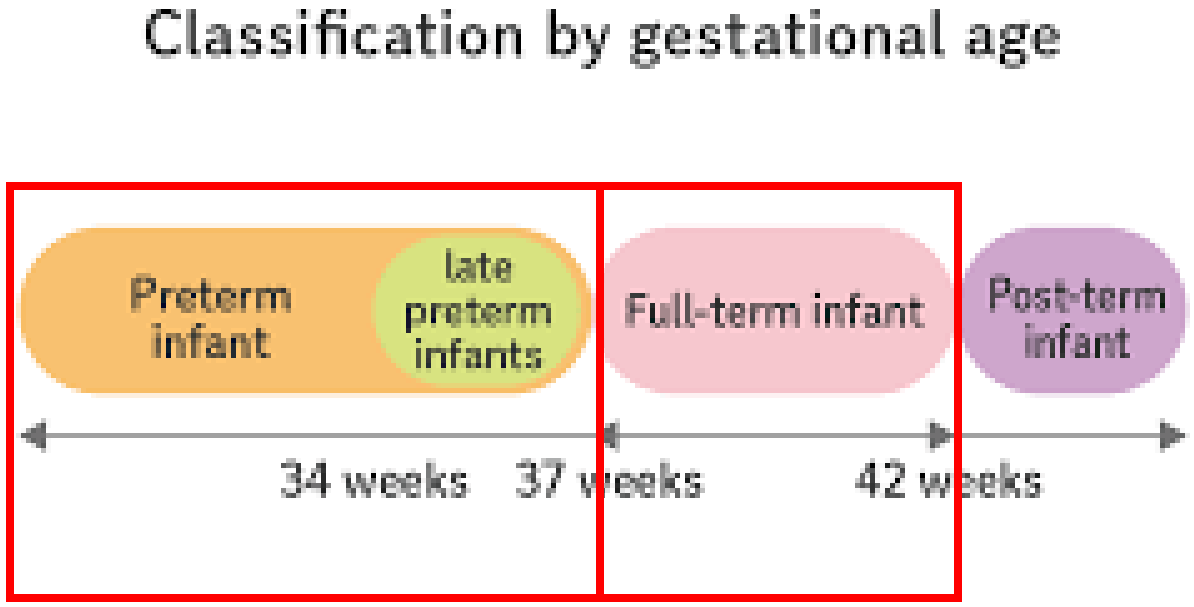
Q 7.2 How do you assess growth

How do you assess the gestational age

Category	Gestation (weeks)
1. Extremely preterm	Under 28
2. Very preterm	28 to under 32
3. Moderate preterm	32 to under 37
a) Early moderate preterm	32 to under 34
b) Late moderate preterm	34 to under 37

Table 2: Categories of preterm birth

Figure 2



Q 7.1 How do you assess the gestational age?

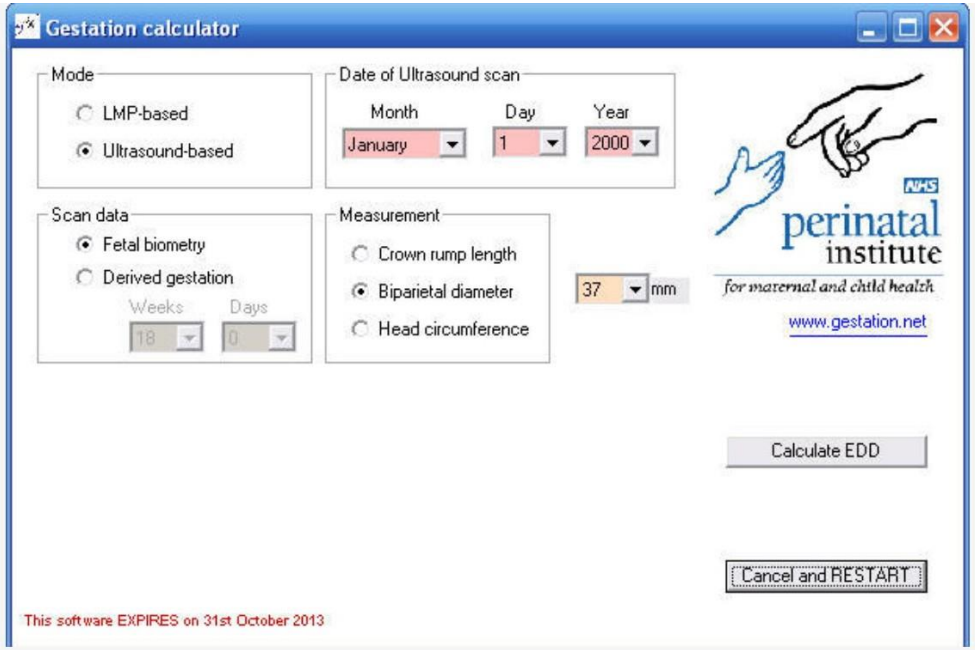
LPM. 22/ 9

Expected + /

\- 7d/3m

29 / 6

- Last menstrual period (**LMP)**
- first trimester **US**
- When the gestational age or due dates are uncertain, a gestational age assessment is completed using the **Dubowitz/Ballard** examination

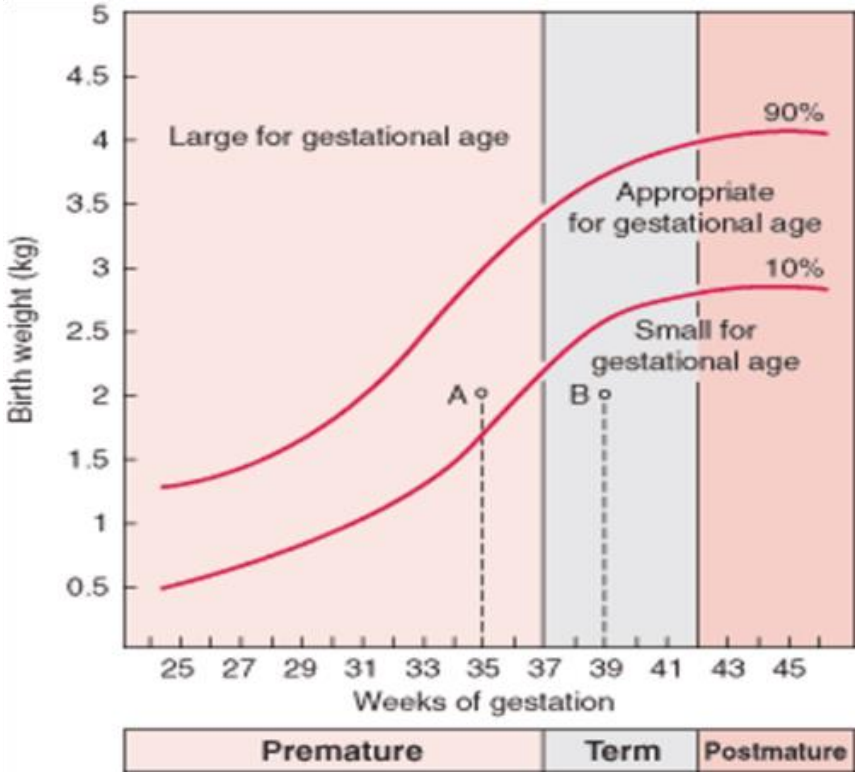


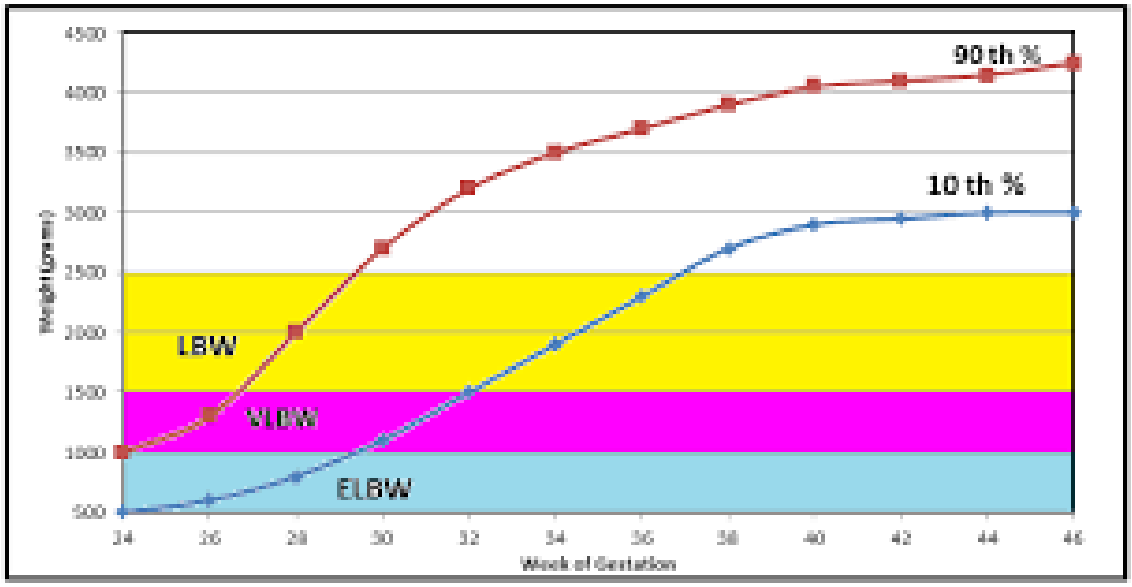
Q 7.2 How do you assess growth?

- Growth Measurement : measure :
  - weight
  - length
  - Head circumference
- Plot them on CDC, WHO , Fenton and intergrowth charts.

- Know if (for AGA, SGA and LGA)

Growth assessment at birth :weight





Growth

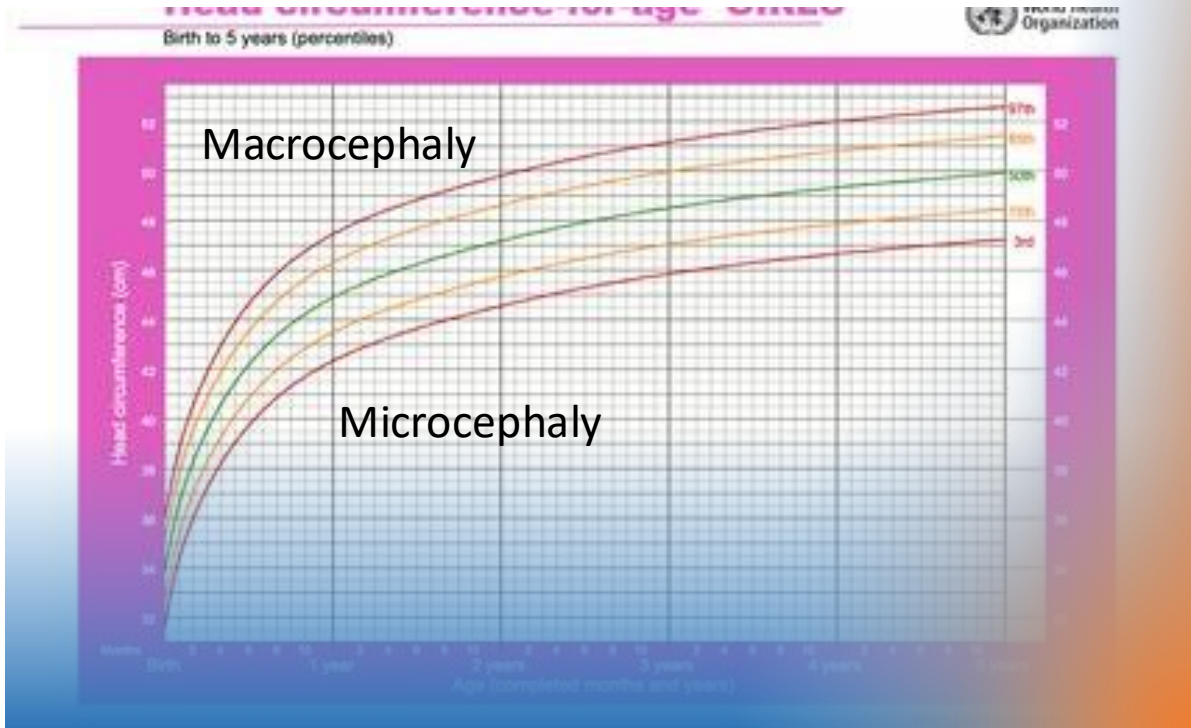
- WEIGHT:
  - The baby will be regaining their birth weight. Most babies are at, or above, their birth weight by 2 weeks.
  - The average daily weight gain for healthy-term babies is about 30gm/day in the first month of life
- **LENGTH:**
  - (from the top of the head to the heel with the leg fully extended)
  - Average range: (46-56 cm)

Head circumference:

- Head circumference (repeat after molding and caput succedaneum is resolved).

- Average range: 33 to 35 cm (13-14 inches)

- Place tape measure above eyebrows and stretch around the fullest part of the occipital at the posterior fontanel.

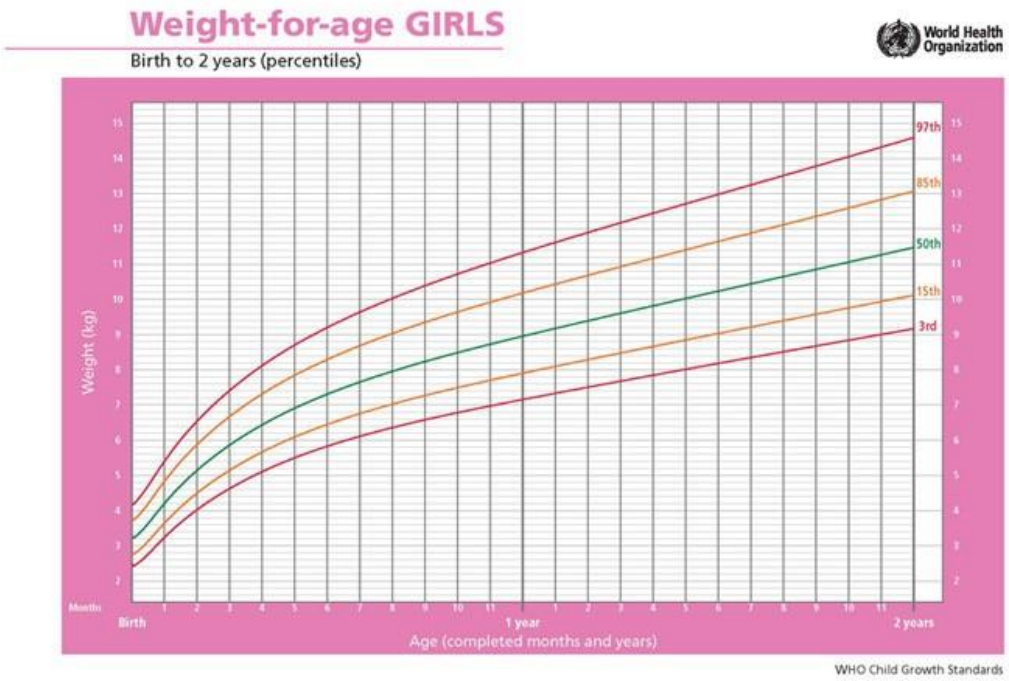


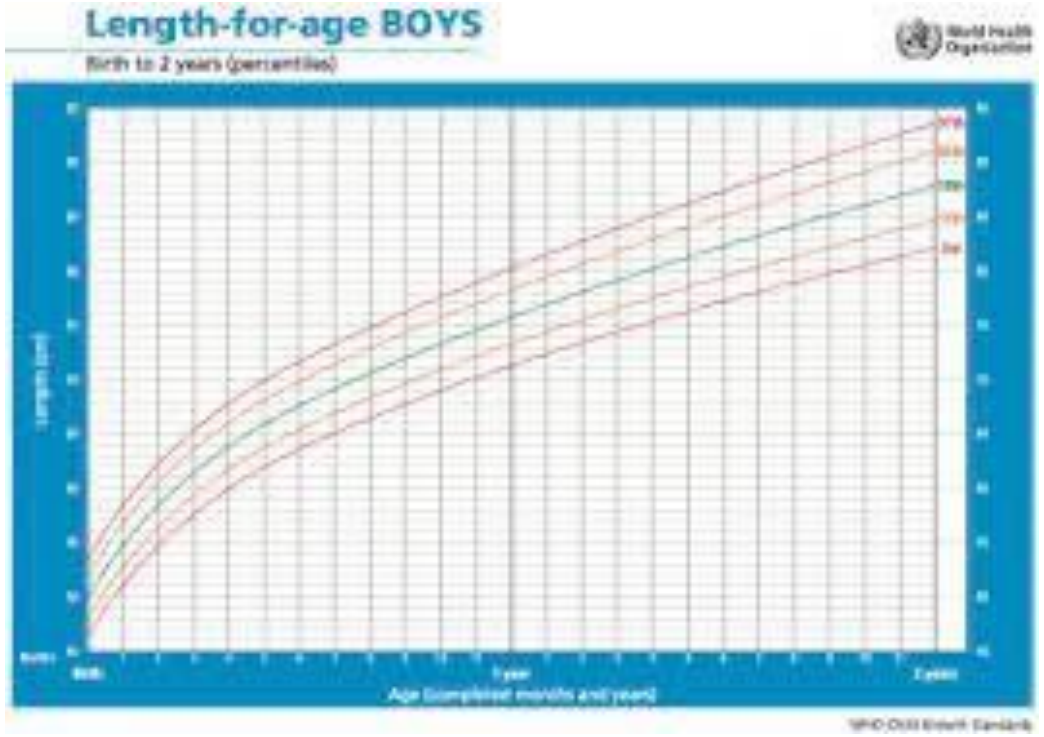
Which charts

Term	Term
Breast fed	WHO
Formula	CDC

Preterm		
Intergrowth (Longitudinal study)	Focuses on growth patterns post-birth for preterm infants	Compares them to other premature babies.
Fenton (Cross-sectional)	Emphasizes size at birth based on gestational age	Fenton compares premature babies to unborn babies

Types of Growth Charts. (Term infants)
1-WHO Growth chart for Breastfed infants

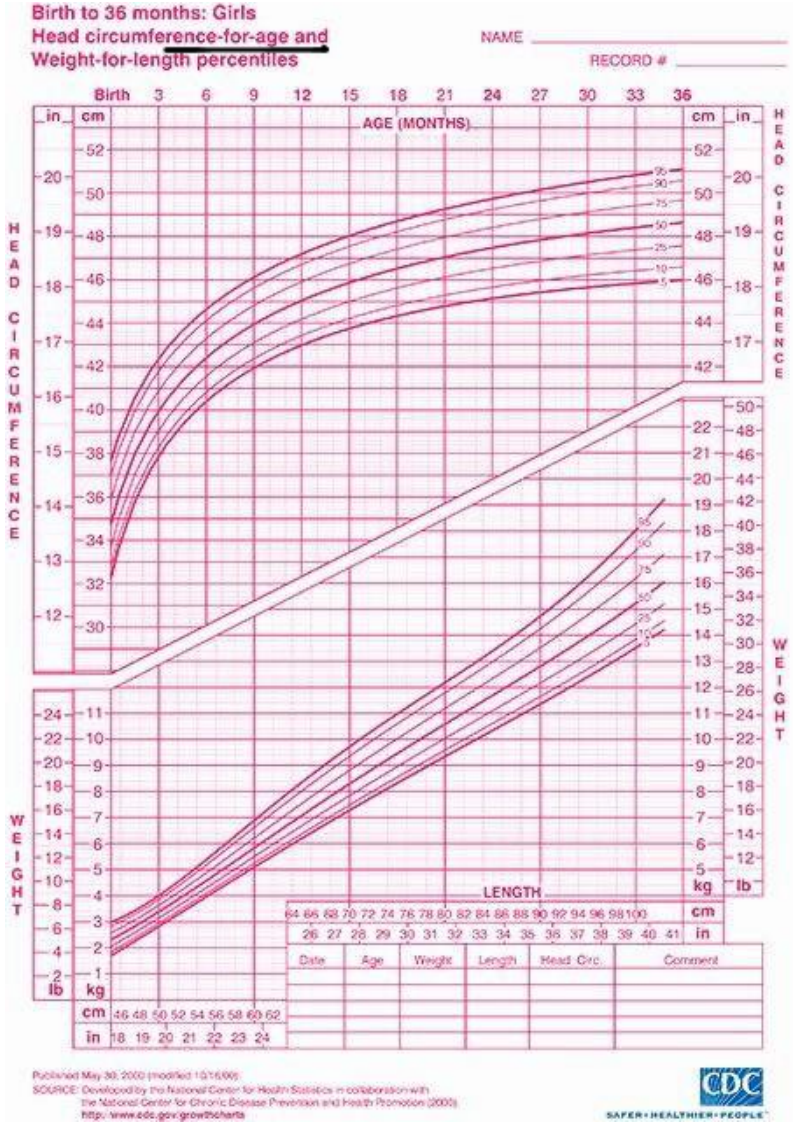


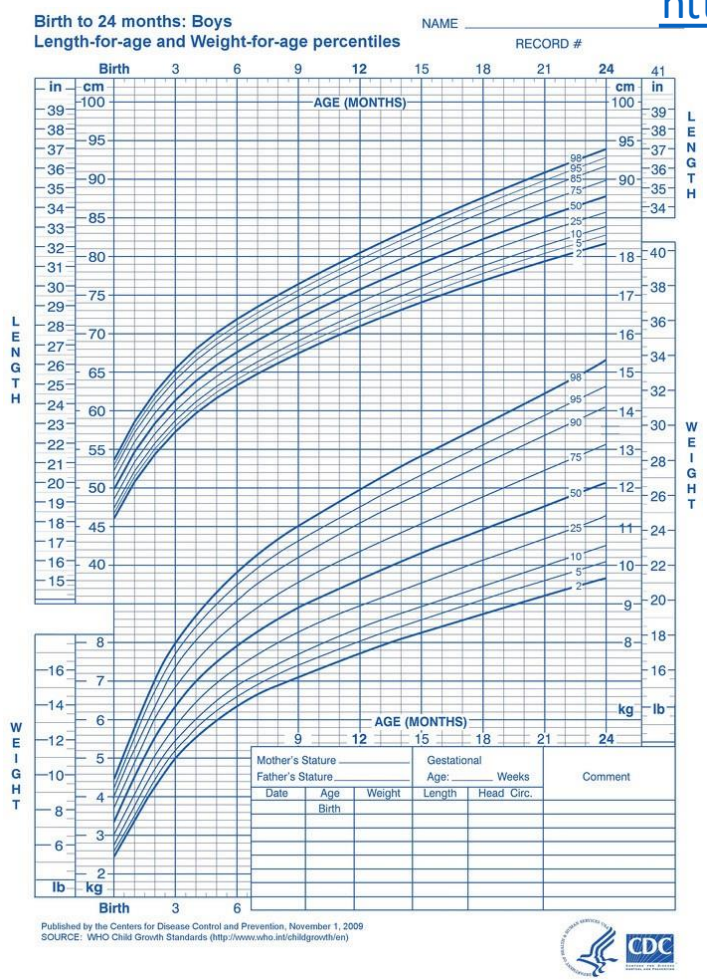


2-CDC growth Charts for US term Children

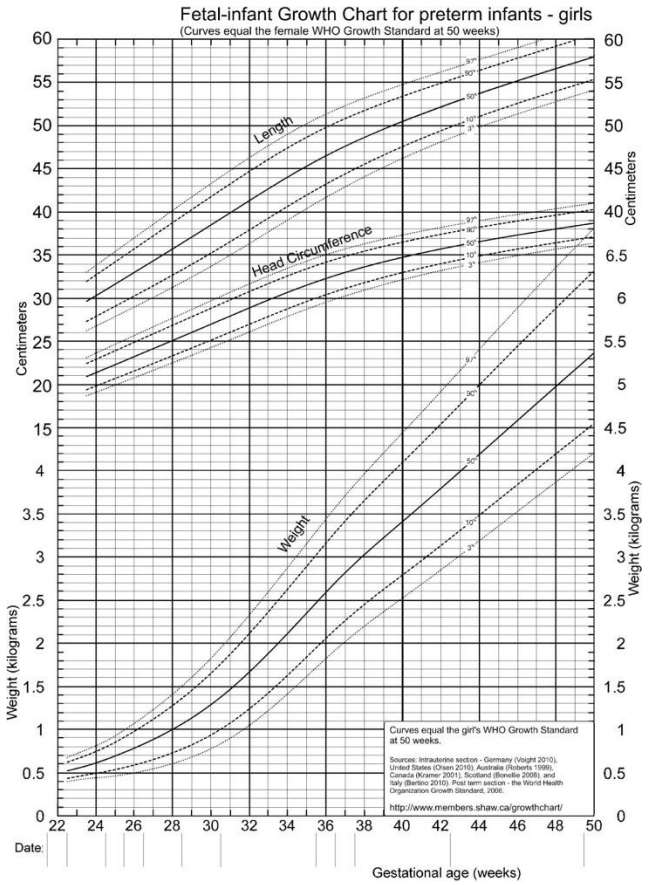
arts/cdc_charts.htm

https://www.cdc.gov/growthch





Fenton charts for preterm infants. (girls and boys)



- https://www.pdffiller.com/jsfiller-desk10/?projectId=6158b1b361eaf62627634145&lp=true#ac4cfc9622534c769873b5b26163e30 8

Growth assessment for preterm

- **Intergrowth charts.**
  - Intergrowth charts <36 weeks (https://intergrowth21.tghn.org/standards-tools/)

HC, weight and length

A couple have many questions for you. Their son **is one** day old now, he is **breast fed every 2-3** Hours . You found that:

- He passed urine 4-5 times of "**brick dust**" color .
- He did not gain any weight at 24 hour of age
- He did not pass stool yet at 24 hour of age.

You examined the baby and found that he has normal physical exam and normal vital signs. Mom asked you if that's normal?

- Q8: **Does he need formula since he did not gain weight today?**
- Q9: Does he have an obstruction?"
- Q10: Is the urine color a cause of concern?
- Q11: Does he need to test his blood sugar to know if it is low?
- Q12: Can they discharge her baby and observe his stool pattern at home ?

How do you address these parental concerns? (Q8 - Q12)

Q 8 : Does he need formula since he did not gain weight today?

- Weight loss in newborns is observed **frequently.**
- In general, **if** weight loss of >10% to 12% in the first postnatal week, it is a cause for concern (necessitates a thorough evaluation).
- Families should be reassured about this progression and can become preoccupied with a normal process because this is a value commonly measured, reported, and compared in the course of routine newborn care.
- **Numerical weight loss** of concern in the presence of a progressively improving feeding relationship **should not drive supplementation**.
- It is typically taught that newborns should **regain their birth weight by 2 weeks** after the birth, although many newborns reach this value much sooner if feeding is well established.
- Emphasis should return to the feeding relationship between mother and infant and **the promotion of breastfeeding.**

Q 8.1 : : When do newborns regain their birth weight?

- It is typically taught that newborns should **regain their birth weight by 2 weeks** after the birth, although many newborns reach this value much sooner if feeding is well established.

- Emphasis should return to:
  - the feeding relationship between mother and infant (demand feeding)
  - and **the promotion of breastfeeding.**
- **How do I know if my newborn is breast fed enough?**
  - **Baby is swallowing during feeding**
  - **Breast feel empty or softer**
  - **Passing urine (**4-6 times /day) **and stool**
  - **Sleeps after feed or feels satisfied**
  - **Starts to gain weight**

You examined the baby and found that he has normal physical exam and normal vital signs. Mom asked you if that's normal?

- Q8: Does he need formula since he did not gain weight today?
- **Q9: Does he have an obstruction?"**
- Q10: Is the urine color a cause of concern?
- Q11: Does he need to test his blood sugar to know if it is low?
- Q12: Can she discharge her baby and observe his stool pattern at Home ?

Normal stooling patterns

Meconium

- The infant typically passes a **first meconium** stool shortly after birth, often within the first hours and typically before 48 hours
- Black, tarry, and sticky stools

Transition Stool

- Occur as the mother's human milk production increases.
- Typically occurs in a pattern, often from green/brown to a seedy, loose, mustard yellow appearance.

It is not rare for an **infant to pass stool** with nearly **every breastfeeding** when the mother's milk is in because of the **gastrocolic reflex** signaling the colon to empty

Stool in infants

Delayed passage of stool

- When the passage of meconium stool is delayed,
  - carefully **recheck the infant's anus** for the normal characteristic.
  - continue to observe **if** the infant is feeding well without abdominal concerns (distension or vomiting).

- Delayed passage of stool beyond 48 hours can indicate serious problems,
  - Such as colonic obstruction from **imperforate anus** with or without fistula, **meconium plug syndrome**, or **Hirschsprung disease**.
  - **Needs imaging**, including barium enema, and **rectal suction biopsy** as the diagnostic gold standard for Hirschsprung should be considered.

Q9: Does he have an obstruction?”

- Answer:

Maybe

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How do you address these parental concerns (Q1 10)

He passed urine 4-5 times of "**brick dust**" color

What is the normal stooling and urine pattern in the newborn baby after birth?

Normal voiding

- When should urine be passed?
  - The infant's first urination nearly **always occurs in the first 24 hours**.
  - Should pass urine 4-6 times /day

- Why is there a difficulty in urine detection
  - Urine can be difficult to detect in the presence of frequent meconium stool
  - Urine could not be seen

How to detect Urine

- ***Review notes***
  - Clinical motes should reviewed to determine if the infant **voided at delivery** or elsewhere and the **voiding was not recorded**.
- ***Look at diaper with strips***
  - Commercially available diapers now commonly have a strips that changes color in the presence of urine, which helps identify small amounts of urine

- Use a cotton ball
  - A cotton ball is placed between the labia or a bag may be applied to collect urine if there is concern that the urine was simply not observed.

- Use invasive
  - If there are continued concerns for anuria, **catheterization**, bladder and **renal ultrasound with urologic consultation**, and evaluation of **renal function** can be considered.

How do you address these parental concerns (Q1: 10)

He passed urine 4-5 times of "**brick dust**" color

What is the normal stooling and urine pattern in their newborn baby after birth?

Appearance of newborn urine

- Can initially be scant and darkly colored.

- Can be (“**brick dust”)**
  - this is ***urate crystals*** (often termed “brick dust”), can be confused with blood in diapers
  - **urate crystals** tend to sit on the surface of the diaper and are iridescent and completely benign.
- DDX
  - Vaginal discharge can be clear, yellow, or white, and even blood-tinged as the female *infant“ withdraws bleed* ” from maternal hormones.

A newborn should not be discharged until the passage of stool and urine can be documented

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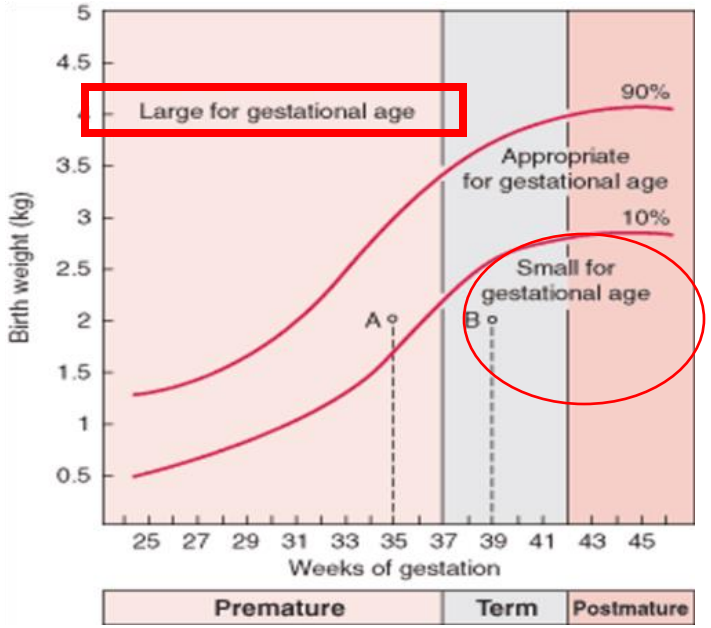
Q 11. Is her baby at risk of hypoglycemia?

Who is at risk for hypoglycemia?

- Infants born to mothers with hyperglycemia during pregnancy (diabetes mellitus (GDM)
- Those who are SGA, or LGA
- Preterm and late preterm
- as well as **sick inf**ants :
  - as those with birth asphyxia, are at risk for hypoglycemia.



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Q12. What should you tell the parents about bathing their infant , cleaning the genitalia and cord care?

Skin care & baby bath

First bath:

- Once a baby's temperature has stabilized, the first bath can be given.
- No need for immediate bathing
- Baby baths can be given at the hospital or at home by using warm water in a warm room gently & quickly.

- Who should be bathed immediately:
- Hepatitis B–positive mothers or HIV Mothers should be bathed at birth

SKIN and umbilical cord care

- The skin is cleaned of blood, mucus & meconium by gentle wiping before he/she is presented to the mother.
- Initially, they should have **sponge baths** until the umbilical cord detaches.
  - In the past, antibiotic ointments, dyes, and alcohol have all been applied to the umbilical cord, but this practice is unnecessary. (AAP recommendation)
- The newborn infant does not require frequent bathing. (2-3 times/week)
- Cleansers should be mild (Non irritant)

Skin and Umbilical cord care.

- **Parents should keep the umbilical stump clean dry and allow it to fall off naturally, generally in 10 to 14 days.**
- **Topical application of antiseptics are not necessary unless the baby is living in a highly contaminated area.**

- Long, flexible but sharp fingernails.
  - Often are a source of concern for the new family.
  - With good lighting and when the child is quiet, the nails can be clipped, cut, filed, or torn.

Care of genitalia

- Care of the uncircumcised penis requires little effort.
  - It can be cleansed externally when regular bathing is established.
  - **Retracting** the foreskin of an infant **is discouraged** because it will likely cause pain, bleeding, and even adhesions.

- If circumcised the penis should **be kept clean and simple petroleum ointmen**t applied to keep the newly exposed glans from adhering to adjacent skin or diaper.

Q13. What sort of anticipatory guidance can you give these new parents regarding avoidance of sudden infant death?

Safe sleep

free of:

1) quilts
2) sleep positioners,
3) other soft objects, such as stuffed animals

Safe sleep

Infant Safe Sleep

1. Baby sleeps in crib.
2. Baby sleeps on back.
3. Nothing in sleep area.
4. Baby's face uncovered.
5. No smoking around baby.
6. Do not overheat or overdress.
7. Firm mattress, tight-fitting sheet.

Anticipatory guidance for safe sleep positioning

To reduce the risk of sudden infant death syndrome

► **breastfeeding**

► a **pacifier** can be offered **once breastfeeding is established**.

- Immunization
  - HBV vaccine at birth
- Congenital heart screen
- Hearing Screen
- Metabolic screen

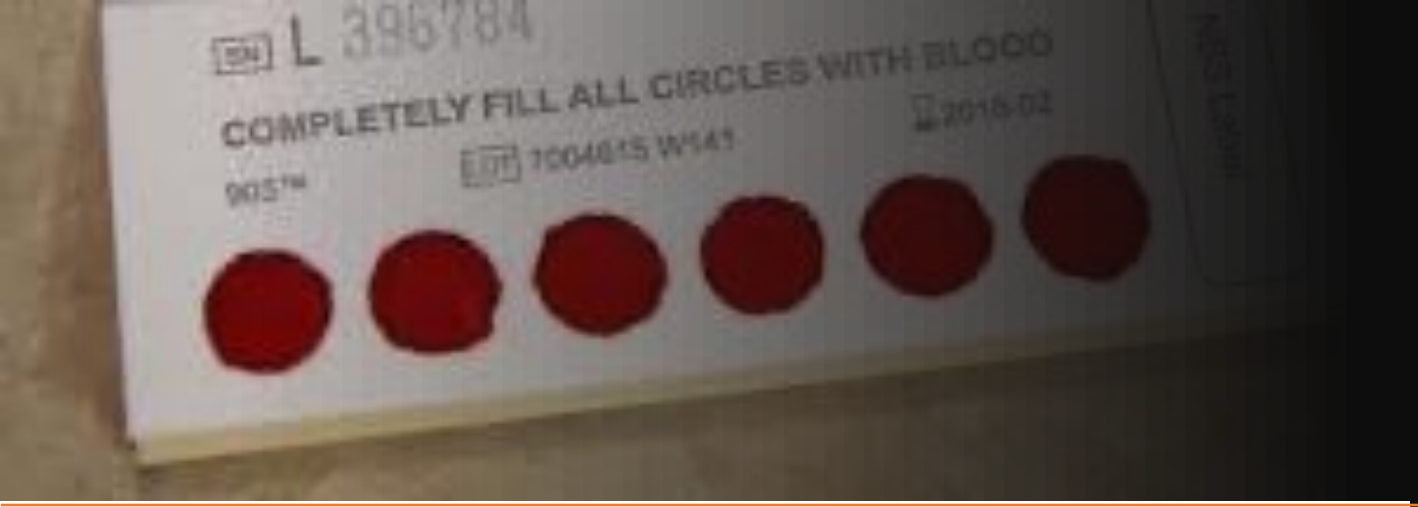
1-3-6 Principle

Goals of hearing screen

(Early Hearing Detection and Intervention) endorsed by the JCIH, AAA, ASHA and the AAP

- Hearing Screening by 1 month of age
- Hearing identification by 3 months of age
- Intervention by 6 months of age

Children with hearing loss who do not receive intervention services by 6 months of age are at greater risk for delays in speech and language development.



Metabolic screen

Newborn screening

WHAT?

- Public health program
- Now an integral part of neonatal care
- Screening babies for potentially treatable conditions, not clinically evident in newborn period
- *"Catch them early"*
  - Aim to identify early before significant morbidities set in
- List of disorders vary from country to country

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Newborn Screening by Genomic Sequencing: Opportunities and Challenges

by David Bick [1,*], Arzoo Ahmed [1], Dasha Deen [1], Alessandra Ferlini [2], Nicolas Garnier [3], Dalia Kasperaviciute [1], Mathilde Leblond [1], Amanda Pichini [1], Augusto Rendon [1], Aditi Satija [1], Alice Tuff-Lacey [1] and Richard H. Scott [1]

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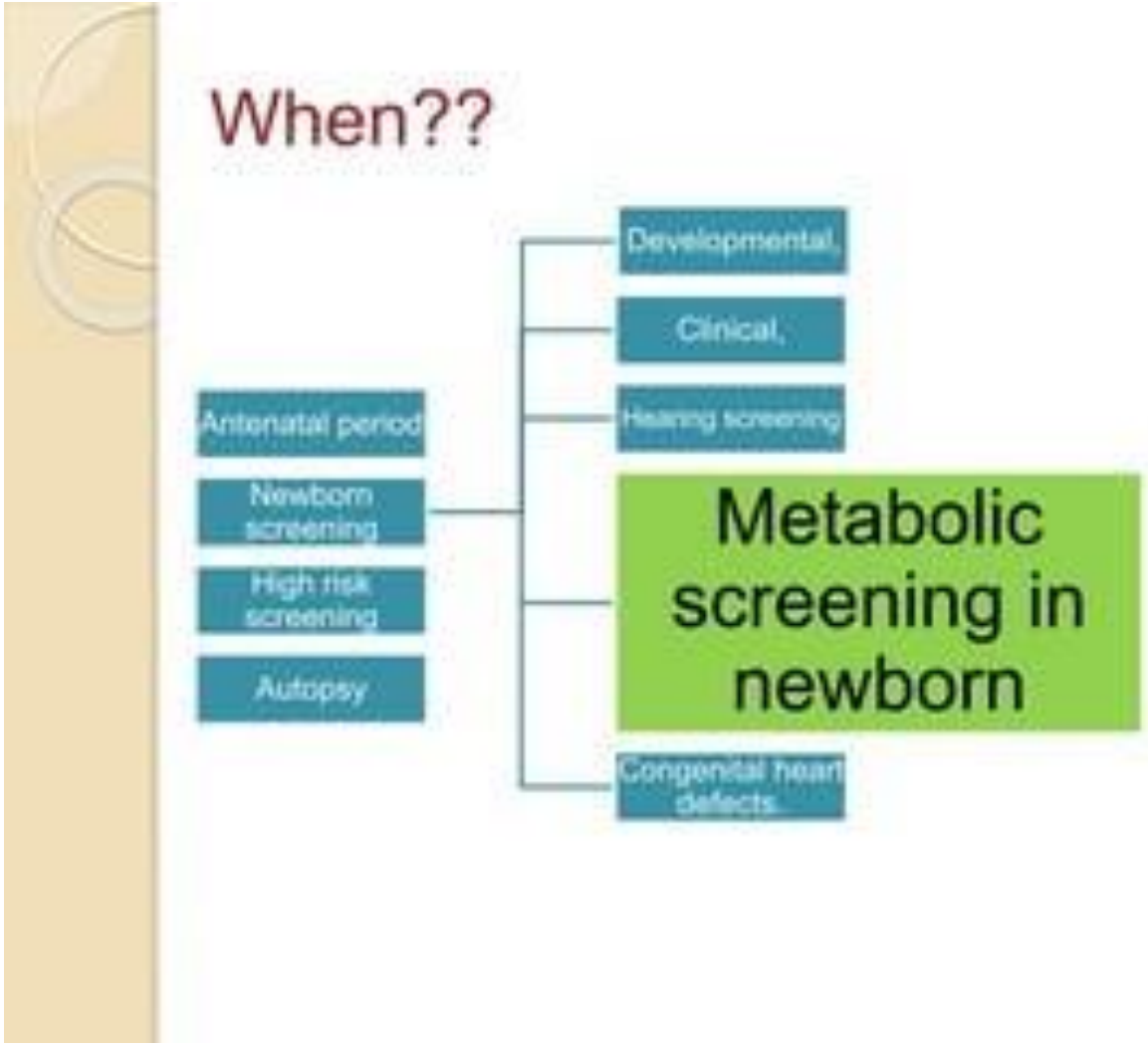


• the overall incidence of metabolic disorders around the world is 1:1350.

•About 5 to 15 % of all sick neonates in NICU are expected to have some Inborn Error of Metabolism

•In Jordan : TSH, G6PD, PKU

•At 2 weeks of age

Congenital heart disease screening program

Why does this matter?

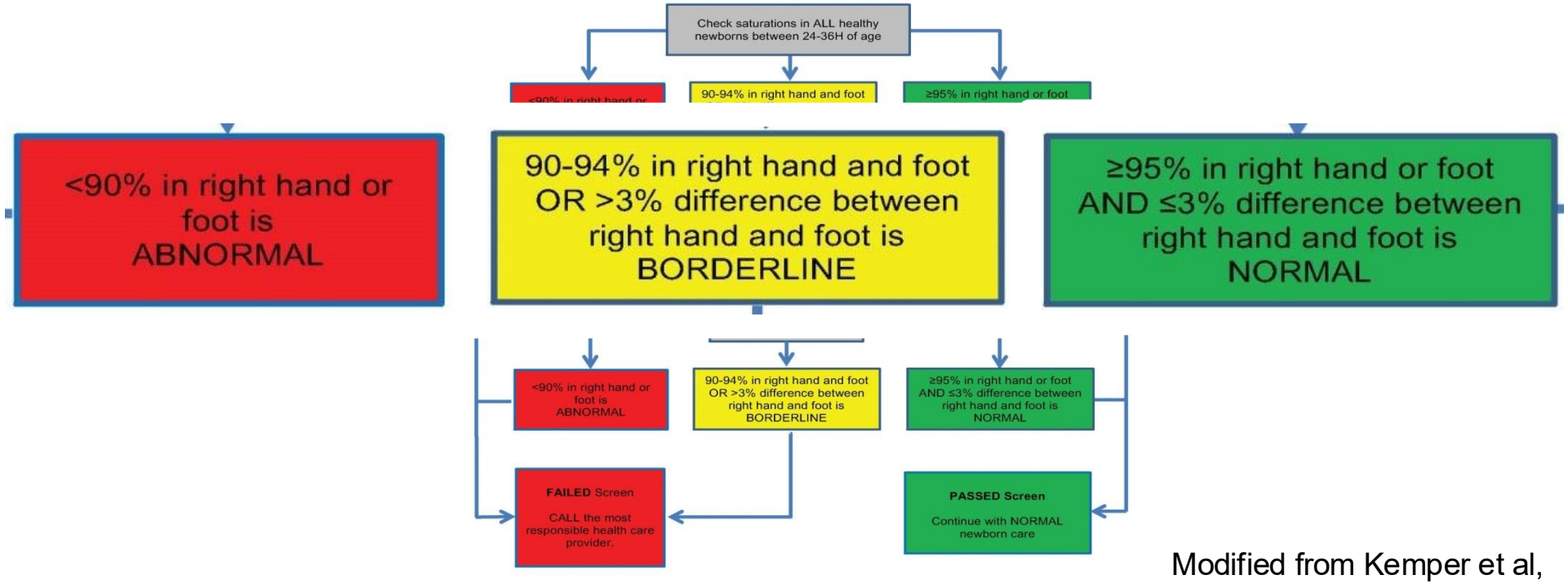
- Congenital heart disease is common
- Critical congenital heart disease is life-threatening

Critical Congenital Heart Disease Lesions	
Most consistently cyanotic	**May be cyanotic**
Hypoplastic left heart syndrome	Coarctation of the aorta
Pulmonary atresia with intact septum	Interrupted aortic arch
Total anomalous pulmonary veins septum	Double outlet right ventricle
Tetralogy of Fallot	Ebstein anomaly
Transposition of the great arteries	Other single ventricles
Tricuspid atresia	
Truncus arteriosus	

Recommendation

Pulse oximetry should be performed using the right hand and either foot.

(Strong Recommendation, Moderate Quality of Evidence)



Modified from Kemper et al, Pediatrics 2011; 2011

Summary of Recommendations

- We recommend that the optimal screening for critical congenital heart disease should include prenatal ultrasound, physical examination and pulse oximetry screening.
- We recommend that pulse oximetry screening be performed between 24-36 hours of age.
- We recommend that pulse oximetry screening should be performed in the right hand and either foot.