

Title: Newborn Examination Powerpoint Presentation

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With funding from: Malaria in Pregnancy Consortium through a grant from the Bill & Melinda Gates Foundation to the Liverpool School of Tropical Medicine

#### **Newborn Examination**





- A full exam is important to find any problems the baby may have and to allow each baby to be treated as well as possible
- It is also important to document the rate of congenital malformations, or birth defects, in each country



#### What is a congenital malformation?

- "Birth defect" encompass a wide variety of conditions and is most simply defined as a defect which is present at birth
- Birth defects may be easily seen, such as a cleft lip, or may affect internal organs and be more difficult to detect without sophisticated testing equipment, such as with certain heart defects



### What is a congenital malformation?

- Birth defects can be cosmetic only, such as a dark birthmark on the face, or they can be life threatening such as a baby born with their intestines on the outside of the body
- Our work will be focused on identifying only those birth defects which can be seen when looking at the external anatomy of the newborn



## **Birth Defects**

- Background rate in industrialised countries ~3% for major malformations
- Rates are unknown in most developing countries
- Causes of birth defects:
  - Genetic defects 10-15%
  - Teratogen 7-10%
  - Multi-factorial 30-35%
    - caused by more than one interacting factor
  - Unknown ~50%



## **Birth Defects**

- For purposes of this project, it is not important to be able to correctly name the different types of malformations
- Rather, it is most important to be able to determine if a malformation is present – applying the correct name to the birth defect can be done later by a trained physician



- Historically, there are several medications that women were given during pregnancy that were later found to cause harm to the baby
- Whenever new medications are released into the market, it is always possible that pregnant women may:
  - Use these drugs before they realize they are pregnant
  - Use these drugs before the drug safety during pregnancy is fully understood



- Currently, the limited data on use of Artemisinin Combination Therapies (ACTs) during pregnancy suggests that ACTs are safe for the unborn baby when used during the 2<sup>nd</sup>/3<sup>rd</sup> trimesters
- However, we still need to improve the evidence by documenting both the number of normal babies born and the number of babies born with malformations among women who used antimalarial drugs during pregnancy



- Considering the high frequency of malaria disease during pregnancy, women need to know that the drugs they are being offered are safe for their unborn baby
- This research will help doctors and women make informed decisions about using drugs to treat malaria during pregnancy



## Importance of the examiner

- Your work in conducting these newborn screening exams are the most important part of being able to understand the safety of ACTs used during pregnancy
- Your careful observations will allow us to correctly count the number of birth defects, an important number which is currently unknown in your community



# Who needs a newborn examination? Every baby!



#### Why does every baby need an exam?

- If you don't look for it, you may not see it
  - Many obvious defects are often missed simply because nobody looked carefully at all parts of the newborn
  - A defect such as an imperforate anus (missing anus) is life threatening and might otherwise go unnoticed if not specifically checked



#### Why does every baby need an exam?

- Fortunately, because most of the babies are born without malformations, the newborn exam is fast and easy
- All babies must have the exam completed and documented on the correct form, even if they appear normal
- Filling in all of the boxes will provide the appropriate evidence that these babies were born normally
  - It is critical to the project that all boxes be filled in and all babies be examined the same way



#### Why does every baby need an exam?

- Newborn exams are trying to determine if there is a problem with the baby such as:
  - Infection
  - Poor feeding
  - Abnormalities
- Newborn exams provide the earliest possible detection of abnormalities
- Newborn exams also establish a baseline for subsequent examinations – is a certain condition or feature getting better or worse?



#### The newborn exam- When

- When:
  - It is best to conduct the exam before the baby is sent home
  - For babies born at home, an effort should be made to complete a newborn exam within the first week of life
  - If an exam is not done within the first week of life, the baby should have a complete exam at their first visit
  - Begin the exam when the baby is calm, this will help to take accurate measurements



#### The newborn exam- Where

- Where:
  - The exam is most quickly and easily performed on an exam table.
  - You should examine all exposed body parts first with the infant's clothing on, then remove all the clothing and thoroughly examine the rest of the body
  - If the mother wishes, she may watch you during the exam



#### The newborn exam- Length of Exam

- Length of the exam:
  - A well skilled examiner can complete the surface exam within a mater of 5-10 minutes.
  - However, when starting out, the exam may take a little bit longer as you get used to the order of the exam, filling in the forms, and all of the exam components.



#### The newborn exam

- Before starting the exam, always wash your hands
- Tell the mother that you will be examining the baby and take the baby to the examination area
- You will need a few materials in order to complete the exam:
  - Tape Measure
  - Digital Scale
  - Examination Form
  - <u>IF available</u>, stethoscope for auscultation (listening) to the heart and lungs



#### The newborn exam

- Babies cannot regulate their own body temperature and can quickly become too cold
- Remember to properly wrap the baby after the exam
- If you are ever unsure whether something should be recorded on the form, please record it and take a picture



# **Newborn Examination Sheet**

- Some of the measurements you will take during the exam will be recorded onto the 'Newborn examination sheet', such as:
  - Date and time of examination
  - Weight (grams)
  - Head Circumference (HC) (cm)
  - Length (cm)



#### The exam will cover the following:

- 1. Record date and time of exam
- 2. General assessment and measurements
- 3. Skull bones
- 4. Face
- 5. Mouth & palate
- 6. Nose
- 7. Ears
- 8. Eyes
- 9. Chest



10. Abdomen 11.Arms 12. Hands 13.Legs 14. Feet 15. Genitals 16. Anus 17. Spine 18. Skin



## The order of the exam:

- Having a routine order of examination makes it less likely that you will forget any parts of the examination
- However, your routine should be flexible.
- If the infant is quiet and relaxed when first approached, assessment of respiratory rate and examination of the abdomen should be done before the baby is disturbed



# Observation

- Before starting the exam take a minute to observe the baby
  - What is the baby's color?
  - In general does the baby look ill or well?
  - Is the baby normally active?
  - Is the cry normal?
  - Are there any obvious malformations?
    - Is the baby funny-looking, such as with a genetic syndrome like Down Syndrome



# Color

- What is the colour of the infant?
  - Normal
  - Pale
  - Cyanotic (bluish)
  - Jaundiced (yellow)





#### **Perioral Cyanosis**



Photo credit Janelle Aby, MD, http://newborns.stanford.edu/PhotoGallery/









#### Measurements



# **Respiratory Rate**

- Normal range of a newborn is 40-60 breaths per minute
- Count the respirations for a full 60 seconds
  - Counting respirations for 15 seconds and multiplying by 4 provides an inaccurate measurement in newborns
- The respiratory rate should be assessed by watching the rise and fall of the chest, and should be done with the infant's chest exposed
- Record when the infant is quiet



## Head Circumference



- Measure around the widest part of the head in centimeters
- This should be above the eyebrows and ears



Photo credit Janelle Aby, MD

# Length

- The child must lie flat and be straightened out to full length
- Length should be measured from the top of the head to the bottom of the feet



# Length

• A UNICEF length board should be used



Measuring height or length of infants

#### Head & Skull bones



## Fontanelle

The soft spot on the top of the baby's head





## Fontanelle

There are two soft spots on the top of the baby's head

POSTERIOR FONTANELLE **ANTERIOR** FONTANELLE

The Anterior fontanelle is in the front, and is larger and more obvious than the posterior fontanelle



#### Fontanelle

- The anterior fontanelle can be:
  - Normal
  - Raised or bulging- suggests infection
  - Depressed or sunken- suggests dehydration
    - If NOT normal, notify a clinician

Sunken fontanelle



**Bulging fontanelle** 



www.pmmdaily.blogspot.com/



# Skull bones

• This shows the skull bones from above; the lines show where the bones fused after birth



- In an infant, these bones remain open to allow the baby to be born- to pass through the mother's pelvis
- Sometimes, these grow together too early, this can result in an abnormal shape of the head

This is where the anterior fontanelle, or large soft spot is



forehead
## Skull bones

- You should be able to feel the large spot in the middle and a smaller soft spot further back on the head
- It is normal to feel a line where the bone is open between these two soft spots, as well as other ridges where the bones are open to allow the baby to pass through the birth canal
- If these bones are already joined, this is called craniosynostosis; this will usually result in an abnormally shaped head
- This should be noted on the form



## Molding and Caput

- When the mother is in labor (especially if it is a long labor) the baby's head may undergo molding or may develop swelling
- Molding means the head becomes misshapen by the pressure in the birth canal
- Swelling of the scalp due to the pressure also occurs, and is called "Caput"
- These resolve without treatment and do not need to be recorded



#### Examples of Molding in the birth canal

- These abnormalities resolve in a few days
- Normal molding does not need to be recorded



Photo credit Janelle Aby, MD



#### Caput

- Scalp edema
- If pressure is applied you will see the characteristic pitting
- Does not need to be recorded

Photo credit Janelle Aby, MD





#### Cephalohematoma



- This is a collection of blood under the membrane which covers the skull bone
- This never crosses suture lines, and so is never present in the midline of the head (note the dip in the middle)
- Feels fluctuant on palpation
- Does not need to be recorded



## Hydrocephalus



David Wrubel, MD

- This is an abnormal fluid collection in the head which makes the head larger than normal
- This should be marked on the form as part of the head examination



## Bruising

- There may be bruising to the head or face if there has been a vacuum or forceps delivery
  - This does not need to be recorded





Photo credit Janelle Aby, MD

#### Face

- Is the baby's face normal?
  - If it looks strange ask the doctor or medic to see the baby
  - Examine:
    - Eyes
    - Ears
    - Nose
    - Mouth





Photo credit Julie Gutman, MD

## Chin

#### • Normal Chin

• Micrognathia /



PHOTOS BY JANELLE ABY, MD

#### Mouth & Palate

Are the palate and mouth normal?
Need to feel inside the mouth for a cleft palate





#### Cleft Lip

Baby with cleft lip



#### **Cleft Palate**

Baby with cleft palate



Cleft palate



## Lip & Philtrum

- A smooth philtrum can be associated with certain disorders and should be noted
- When examining the philtrum, the infants face needs to be relaxed, the face should not be crying or smiling





#### Nose

- Are there 2 nostrils?
- Are both nostrils open?
- **Choanal atresia** (a blocked nostril) is checked by seeing if the infant can breathe with the left and then right nostril occluded (blocked) alternately:
  - When you block the left nostril, you are checking that the right side is open
  - When you block the right nostril, you are checking that the left nostril is open
  - Infants do not know how to breathe through their mouths, so if both nasal passages are blocked, they will have difficulty breathing.



Ears



Photo credit Janelle Aby, MD and Julie Gutman, MD

## Eyes

- Make sure there are 2 eyes, and that they are of the same size
- If you can get the baby to open their eyes, make sure that they are clear and of equal size, with round pupils
- Cataracts
  - Eyes appear cloudy



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#### Chest

 Look at: shape, symmetry, location of nipples, accessory nipples



Extra nipple (not significant and not necessary to report)



## Chest

- Are any of the following present?
  - Chest indrawing
  - Nasal flaring
  - Tracheal tug
  - Head bobbing
  - These are signs of respiratory distress, if a baby has these, ask for help!
  - Record these on the form under chest



#### Chest Indrawing (Retractions)



PHOTO BY JANELLE ABY, MD



#### Abdomen



malaria in pregnancy consortium

Photo by Julie Gutman, MD

## Abdominal Examination

- Does the abdomen appear distended?
  - If yes, contact a medical doctor for further examination
- Palpate the abdomen to feel for the liver and spleen
- Are any abnormal masses felt?



#### Umbilicus



PHOTO BY JANELLE ABY, MD



## Umbilicus

- Careful inspection of umbilicus should include checking on the adequacy of the cord tie or clamp
- The umbilical cord usually has 3 blood vessels
- If only two are found, the baby is at risk of having other more serious congenital abnormalities



#### **Umbilical Vessels**



2 arteries (A) and one vein (V) The vein is the largest of the 3 vessels



## Abdomen

#### **Diastasis Recti**

- This is a NORMAL finding and usually resolves over time
- Does not need to be recorded



PHOTOS BY JANELLE ABY, MD

#### Umbilical hernia

- This will resolve on its own if small
- Record on the form under abdomen



#### Abdominal Wall Malformations in which the internal organs remain outside the abdomen





#### • OMPHALOCELE

- The internal organs remain in a sac
- Protrudes through the umbilicus

#### • GASTROSCHESIS

- The umbilical cord is not involved
- The internal organs are NOT enclosed in a sac

#### If either of these are present, notify a clinician!!



## Omphalocele

 The infant's intestine or other abdominal organs stick out of the belly button or navel into the umbilical cord.





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#### Gastroschisis

 The infant's intestines protrude out of the body through a small hole in the body wall beside the umbilical cord. The body wall defect can be small or large and other organs such as the liver can be involved.



#### Limbs

Are the limbs, fingers and toes normal?
Describe on the sheet if abnormal





#### Fingers



# Post axial polydactyly or extra "dangling" finger



Syndactyly or fused fingers



PHOTOS BY JANELLE ABY, MD

#### Toes



#### Post axial polydactyly

# Syndactyly or fused toes



#### Club foot





#### Genital exam

• Is the genitalia normal?

• In boys, are both testes descended?



Normal Male Genitals



#### Hypospadias



- Penis opens on the underside of the shaft
- A 'hooded foreskin' strongly suggests the presence of hypospadias


#### Hydrocele

- If you palpate, the testicles should be present, but will be small
- The sac should feel very soft and fluid filled If you shine a light on



the sac, it will illuminate



PHOTOS BY JANELLE ABY, MD

#### Normal Female Genitalia





 Female infants may have some whitish discharge or even some small amounts of blood from the vagina



You should try to separate the labia, as in the picture on the right, to make sure they are not fused (stuck together)



#### Normal Anus



Taking a rectal temperature and inserting the thermometer 1-2 cm or inserting a gloved finger 1-2 cm into the rectum confirms that the anus is patent



Photo by Julie Gutman, MD

#### Imperforate Anus

- Note that there is no opening for the anus!
- This can be excluded by routine careful examination of the anus
- Any unusual appearance warrants careful investigation



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#### Imperforate Anus

 A baby with imperforate anus may still pass meconium if there is another associated abnormality, such as an abnormal connection between the vagina and rectum (recto-vaginal

fistula)







#### Back





PHOTOS BY JANELLE ABY, MD

## Back & Spine

- Look at the back
- Pay careful attention to abnormalities along the midline or along the spine
  - Look for birthmarks, dimples, or tufts of hair along the spine
  - These may be a sign of a more serious problem such as Spina Bifida
  - Record any abnormalities that you see
- Examine the spine to make sure there are no abnormalities in the bones

#### **Sacral Dimple**



## Sacral Skin Tag





PHOTOS BY JANELLE ABY, MD

## Neural Tube Defects

- The neural tube is a narrow channel that folds and closes during the 3<sup>rd</sup> and 4<sup>th</sup> weeks of pregnancy to form the brain and spinal cord
- Incomplete closure of this tube results in several different birth defects
  - -Anencephaly
  - -Encephalomyelocele
  - -Spina bifida



## Anencephaly



- Missing parts of the brain, skull, and scalp
- Babies with this condition often are born without the thinking part of the brain
- The remaining brain tissue is often exposed; that is, it is not covered by bone or skin



#### Encephalocele

- A sac-like protrusion of the brain through an opening in the midline of the skull



## Spina Bifida

- Spina Bifida is a malformation where the bones around the spinal cord do not close all the way
- Sometimes, the skin is open as well, and the spinal cord is exposed
- If you see this, tell a clinician!





### Saccrococcygeal Teratoma

- A tumor found in the midline of the body
- In newborns, the most common location is the sacrococcygeal region- at the base of the spine
- This is a mass of tissue, and does not come out of the spinal cord as in Spina bifida



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#### Rashes

- Rashes do not need to be recorded on the examination form
- But, since you are examining the baby, the parents may ask you about the rashes
- These are a few normal rashes that you may see



#### Rashes

#### Petechiae

Words to describe rashes

Red Raised Flat Pustules





#### **Pustules**



#### Normal Newborn Rashes





#### Milia

#### **Erythema Toxicum**



### **Birthmarks**

- Birthmarks do not need to be recorded on the examination form
- But like rashes, parents may ask you
  - Very common to have blue marks (Mongolian spots) on the buttocks
  - Very common to have a red mark on the back of the neck or above the eyes







PHOTOS BY JANELLE ABY, MD

# **Neurological Examination**

- Means looking at muscles and nerves
- Does the infant have normal muscle tone?
  - Is the infant too floppy or too stiff?
- Is the infant moving all limbs normally?
  - If no, describe





Photo: http://library.med.utah.edu/pedineurologicexam/

### Conclusions

- Never be worried to ask a doctor or medic to see child
- If you find or suspect any abnormality, a doctor must be notified
- If you are unsure if an abnormality is present, ask a doctor to confirm
- Routine physical examination takes only a few minutes and should be carried out in ALL infants as soon as possible



#### Thank You

#### Any Questions?



## Acknowledgements

- Claudia Turner for some of the slides from her SMRU Newborn exam presentation
- For providing pictures:
  - Dr. Janelle Aby, Stanford Department of Pediatrics
  - Dr. François Luks, Brown Medical School
  - Dr. Paul D. Larsen, University of Nebraska Medical Center and Dr. Suzanne S. Stensaas, University of Utah School of Medicine
- Sadie Rae Litner for her many appearances in the pictures

