# NEWBORN ADAPTATIONS AND COMPLICATIONS

Nursing 124
Joan Kohl, MSN, RN
jkohl@dhs.lacounty.gov
Los Angeles County College of Nursing

10-30-17

## NEWBORN ADAPTATION

Neonatal Period

Birth to 28 days

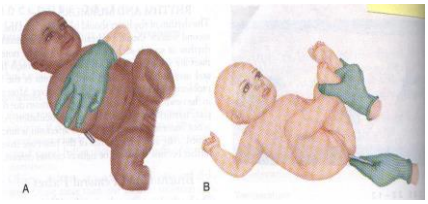
## NEWBORN ADAPTATION

Fourth Stage of Labor
Immediate assessment at birth
ABC - VS
Respirations most critical
Circulation must convert
Gross anomalies
Umbilical cord
Apgars

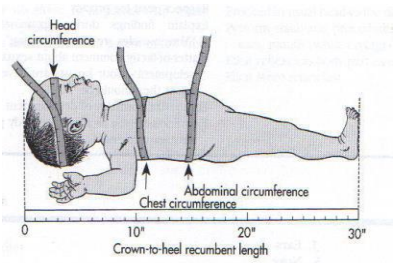
## HEART RATE

## RESPIRATION

## AXILLARY VS RECTAL TEMPERATURE



## OBTAINING MEASUREMENTS




## RESPIRATORY ADAPTATION

Initiation and Maintenance of respiration

Chemical Factors

Mechanical Factors

Thermal Factors

Sensory Factors

## CARDIOVASCULAR ADAPTATION

Changes at birth

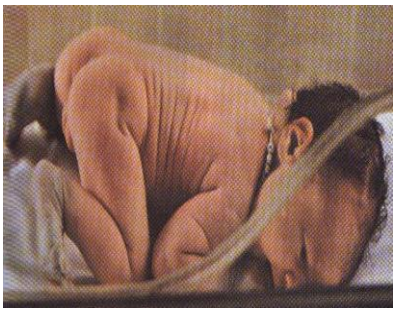
Three shunts close

Ductus venosus

Ductus arteriosis

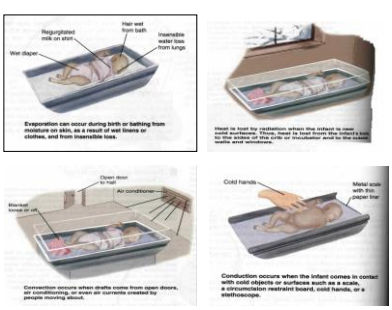
Foramen ovale

## ACROCYANOSIS



## BROWN FAT

## METHODS OF HEAT LOSS



## NEUROLOGIC ADAPTATION

Thermoregulation
Critical to survival
Brown fat
Lasts several weeks
Depleted with cold stress
Four methods of heat loss

## GI ADAPTATION

Stomach
Capacity
Intestines
Vitamin K
Enzymes
Stool

## HEPATIC ADAPTATION

Blood glucose
Iron Stores
Bilirubin

## RENAL ADAPTATION

Newborn void within 24 hours
Will void 5-6 times by day 3-4
Uric acid crystals

## IMMUNE ADAPTATIONS

Antibodies and IgG cross the placenta
Breastmilk provides more antibodies
Infection can quickly lead to Sepsis

## INTEGUMENTARY

## PSYCHOLOGICAL ADAPTATION

Periods of reactivity
First period
Resting period
Second period

## FIRST FEEDING

Initiate within two hours
Breast vs bottle
Reflexes
Colostrum
Antibodies
Antimicrobials

## NEWBORN ASSESSMENT

Measurements
Weight
Head
Chest
Abdomen
Length

# NEWBORN ASSESSMENT

Patient Education
Feeding
Bathing
Diapering & Dressing
Follow-up appointments
VNA referral
Social assistance

# NEWBORN COMPLICATIONS

# ANKYLOGLOSSIA

Before frenotomy After frenotomy

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Clinical Associate Professor Pediatrics, Stanford University; Medical Director, Weil Baby Nursery Lucile Packard Children's Hospital

## NEWBORN INJURIES

- Soft tissue injuries
- Skull injuries
- Eye injuries
- Erythema
- Petechiae

## SOFT TISSUE INJURIES

- Caput Succedaneum
  - Cephalic edema
  - Crosses suture lines
  - Disappears without treatment
  - No pathologic significance

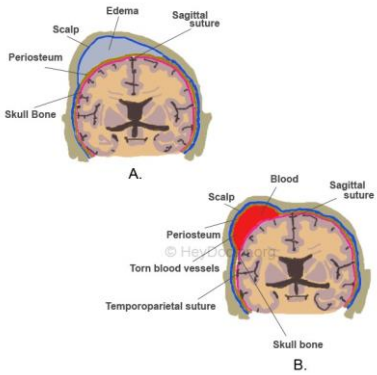
## SOFT TISSUE INJURIES

- Cephalohematoma
  - Definition
    - Blood clot between the skull and the periosteum
  - Cause
    - Rupture of periosteal bridging veins

## SOFT TISSUE INJURIES

- Cephalohematoma
  - Unilateral or bilateral
  - usually minimal to absent at birth
  - increases in the first 3 days of life
  - disappears gradually over time
  - Hyperbilirubinemia may result

## CAPUT OR CEPHALOHEMATOMA?



## SKELETAL INJURIES

- Clavicular fractures
- Humerus and femur fractures
- Skull Fractures

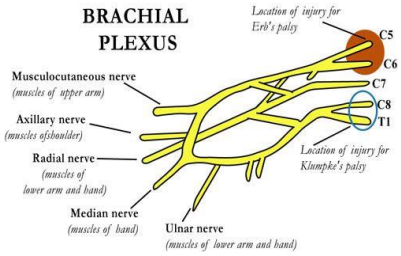
## CLAVICULAR FRACTURE

- Fractured during birth d/t dystocia
- Dx findings
- No treatment necessary
- Prognosis is good

FORCEPS DELIVERY

# PERIPHERAL NERVOUS SYSTEM INJURY

- Erb-Duchenne paralysis
- Klumpke's paralysis
- Facial palsy or paralysis




## ERB'S PALSY

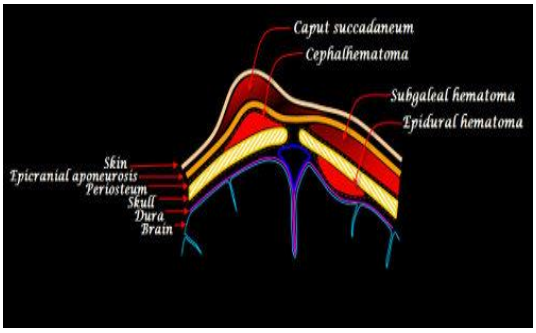
## KLUMPKE'S PALSY

## FACIAL PALSY

## CENTRAL NERVOUS SYSTEM INJURY

- All types of ICH occur in newborns
  - Subdural hemorrhage
  - Subarachnoid hemorrhage
  - Subgaleal hemorrhage
  - Spinal cord injury

## SUBGALEAL BLEED




## RH INCOMPATIBILITY

- Screening
  - Mother Rh neg - fetus Rh pos
  - Sensitization - isoimmunization
  - Mother forms antibodies
  - Indirect Coombs test
  - Direct Coombs test

## R.H INCOMPATIBILITY

- Child of first pregnancy is usually unaffected
- Subsequent fetus is affected
- Potential for hemolytic disease

## R.H INCOMPATIBILITY

- Hemolytic disease of the newborn AKA Erythroblastosis fetalis
  - Severe hemolytic syndrome
    - –Hydrops fetalis
    - –Icterus gravis
    - –Kernicterus
    - –Congestive heart failure

## RHOGAM
## RHO(D) IMMUNE GLOBULIN

- Given after termination of pregnancy <u>for any reason</u>
- Must be given within 72 hours
- Action: suppression of immune response in nonsensitized women with Rh (-) blood

## RHOGAM

- **Adverse effects**
  - **Myalgia**
  - **Lethargy**
  - **localized tenderness and stiffness at injection site**
  - **possible allergic response**
- **NEVER administer medication to infant**

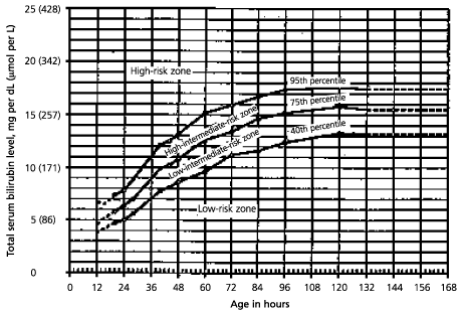
## ABO INCOMPATIBILITY

- More common and causes less severe problems in the affected infant.
- Occurs if fetal blood type is A, B, or AB and the maternal blood type is type O
- First born infants may be affected

## HYPERBILIRUBINEMIA

- Elevation of bilirubin levels
- Caused by accumulation of unconjucated (indirect) bilirubin in the skin
  - Jaundice is a yellow discoloration of the skin

# HYPERBILIRUBINEMIA




# PHYSIOLOGIC JAUNDICE

- Common in term newborns
- Occurs after 24 hours of age
- Associated with insufficient feeding and infrequent stooling.
- Bili levels peak at day 3 and decline slowly
- Also called early onset jaundice

# NONPHYSIOLOGIC JAUNDICE

- Usually caused by hemolytic disease of the newborn
- May occur in the first 24 hours
- Can cause encephalopathy
- May lead to kernicterus
- Partial exchange transfusion

## LATE ONSET JAUNDICE

- Develops second week of life
- Infant thriving, gaining weight,stooling
- Pathologic causes ruled out
- Factor in human milk increases the intestinal absorption of bilirubin.

## HYPERBILIRUBINEMIA

- Treatment
  - Prevention
    - early and frequent feeds
  - Phototherapy
  - Exchange transfusion

## PHOTOTHERAPY

- Use of florescent lights
- Infant unclothed, exposed to lights
- Cover eyes and genitalia
- Turn infant Q 2 hours
- Remove from lights to feed and bond

## NURSING CONSIDERATIONS

- eyes
- skin integrity
- lotions
- Sleep
- temp
- I + O
- fluid loss
- energy output
- home monitoring

## PHOTOTHERAPY

## PHOTOTHERAPY

# INFANT OF DIABETIC MOTHER (IDM)

- Problematic for fetus and newborn
  - Higher mortality than non-DM
  - More congenital anomalies
  - More macrosomia or IUGR
  - Hypoglycemia is common

# NEWBORN GLUCOSE MONITORING ALGORITHM

| | | | | |
|---|---|---|---|---|
| **Heelstick #1 – at 1 hour of life or anytime symptomatic**<br>• **If < 45 mg/dL and symptomatic transfer to NICU**<br>• **If > 45 mg/dL and symptomatic call MD for evaluation**<br>• **Recheck needed 1 hr after feed?** | | | | **_____ mg/dL Hgb _____**<br>• **If <25 mg/dL call MD for transfer to NICU**<br>• **If 25-44 mg/dL and asymptomatic, STS, feed and recheck glucose in 1 hour ***<br>***_____ mg/dL**<br>• **If > 44 mg/dL, BF on demand and recheck in 2-3 hours (preferably before feeding). Repeat until > 44 mg/dL x2** |
| **Heelstick #2**<br>• **Recheck needed 1 hour after feed?** | | | | ____ |

# INFANT OF DIABETIC MOTHER (IDM)

- Nursing Assessments
  - Assess for
    - Hypoglycemia (algorithm)
    - Anomalies or injury
    - S/S of complications
    - Emotional support to mother

## QUESTIONS

- Brown fat is used to:
  - A. Facilitate digestion
  - B. Conjugate bilirubin
  - C. Metabolize glucose
  - D. Maintain temperature

## QUESTIONS

- Which newborn reflex can help the new mother learn to breastfeed?
  - A. Moro
  - B. Rooting
  - C. Tonic neck
  - D. Palmar grasp

## QUESTIONS

- The primary difference between physiologic and pathologic jaundice is the:
  - A. type of feeding method chosen by the mother.
  - B. time of onset and rate of rise in bilirubin levels.
  - C. location of the yellow areas on the newborn's skin.
  - D. number of broken down fetal erythrocytes

## QUESTIONS

- Best location for an infant's glucose determination is the:
  - A. nondominant heel.
  - B. midline of the heel.
  - C. great toe of either foot.
  - D. lateral surface of the heel.

## QUESTIONS

- The infant of a diabetic mother is prone to hypoglycemia because:
  - A. high insulin production rapidly metabolizes glucose.
  - B. vulnerability to infections increases metabolic stress.
  - C. excess subcutaneous fat reduces blood flow to tissue.
  - D. liver conversion of glycogen to glucose is sluggish.