Adaptation to Extrauterine Life

- At term, the fetus is ready and mature enough for separate existence, behavior competencies, and social interaction
- TRANSITION
- Critical period for assessment and observation

Transitional Periods

- First Period of Reactivity
- Sleep/Inactive Period
- Second Period of Reactivity
Immediate Adaptations- Respiratory

- 1. First big breath/cry at birth - reflex
- 2. Signs of distress
- 3. Surfactant
- 4. On NB asmt – symmetry of expansion, clavicles/ribs; crackles normal first 30 min-1hr.

Cardiovascular

- 1. First breath initiates a series of CV changes from fetal to neonatal circulation
- 2. Rate 140bpm
- 3. BP 60-80/40-50.
  Blood volume = 300ml

Thermoregulation

- Thermogenesis – heat production
- Brown fat – richer in vascular supply;
- Hypothermia is common & DANGEROUS
HEAT LOSS

Four modes of heat loss
✓ Convection
✓ Radiation
✓ Conduction
✓ Evaporation

Convection

✓ Loss from body surface to cooler ambient air.

Radiation

✓ Loss from body surface to cooler solid object NOT in contact with body.
Conduction

- Loss to cooler solid object in contact with body.

Evaporation

- Loss through conversion of skin water to vapor.

Temperature Regulation

- COLD STRESS
- Increases need for O2; oxygen to produce heat takes priority over maintenance of brain cells/CV function.
Temperature Regulation cont.

- Cold stress — increases basal metabolic rate. Glycolysis produces excessive fatty acids which causes metabolic acidosis and jaundice
- SO WHAT...
- Heat Stress — sweat glands nonfunctional

Hematopoietic

- Hemoglobin = 12-24g/dl, average 17
- Hematocrit = 44-64%, average 55
- WBC = 9,000-30,000 normal at birth
- Clotting Factors

Renal

- Limited ability to concentrate urine
- Normal number of voidings 6-10 per day
- Urine pale straw color, also normal is cloudy or pink-tinged
- Fluid balance — newborn normally loses 5-10% of birth weight; returns to normal within 10 days
Gastrointestinal
• Mouth – gums pink and moist; “sucking” pads
• Sucking, swallowing, breathing - depends on neuromuscular development
• Bowel sounds – present soon after birth
• Stomach – 30-90ml capacity
• Digestion – simple carbs, protein, limited fats
• Stools – meconium in first 12-24 hours; 3rd day has transitional stools, 4th day = milk stool

Abdomen
• Umbilical cord – 3 vessels
• Bowel sounds present 1-2 hours after birth
• Palpation – hepatospleenomegaly? Remember renal masses!
Hepatic

- Liver fills 40% of abdominal cavity
- Metabolizes CHO
- Iron storage
- Conjugation of bilirubin
  - immaturity, high hematocrit, bruising, cold stress, hypoglycemia, respiratory distress, hemolysis

Physiologic Jaundice

Neonatal hyperbilirubinemia
- appears after 24 hr, disappears by day 7
- signs and symptoms:
  - yellow sclera, mucous membranes, thorax, abdomen and extremities
- Kernicterus – 20mg/dl results in brain damage (enough bili has left blood to interfere with brain cell synthesis)
Immune System

- Passive immunity from Mom
- Neonate immune factors
  produces IgG early
  IgA, IgD, IgE – much later and not fully
developed until children
  IgM – produced at birth
  Hepatitis B – HbIG – vaccine given within
  12 hr of birth to protect from Hep B

HEAD

- Caput succedaneum – edema of scalp
due to pressure during labor/ molding
- Cephalohematoma – blood between skull
  and periosteum

Integumentary

- Color appropriate for ethnicity;
- Vernix Caseosa
- Erythematous
- Skin of extremities
- Lanugo
- Desquamation
- Creases on palm/ soles
Integumentary, cont.

- Milia
- Mongolian spots
- Stork Bites – telangiectic nevi
- Strawberry Mark - Nevus Vasculosis
- Port Wine Stain – Nevus Flammeus
- Erythema Toxicum
- Edema
Skeletal
- Head - 33-35cm.
- Molding – normal, will reduce in several hours or days
- Microcephaly - <32cm. Disease? Genetic?
- Macrocephaly - >4cm of chest circ; hydrocephaly?

Fontanels
- Spaces between skull bones
- Anterior
- Posterior
- Should not be bulging, full, or depressed
- Sutures

- Spinal column – normally has a C-curve
- Hips – inspect buttocks, number of skin folds should be equal bilaterally
- Ortolani’s maneuver – congenital hip dysplasia/ dislocation asmt. “CLICK”
Legs, fingers, toes

- Correct/equal length and number
- Syndactyly or polydactyly
- Simian creases – continuous line across palm of hand frequently associated with Down’s syndrome.

Eyes, nose, ears, mouth

- Eyes – placement; no tears or discharge
- Ears – symmetry; placement
- Nose – symmetrical, no drainage; patent nostrils. Nose breathers!
- Mouth – assess palate; elicit suck reflex
- Epstein Pearls
Reproductive

- Breasts – swollen
- Female – ext. genitalia enlarged
- Male – pigmentation, testes descend and rugae
- Smegma
- hypospadias – urethra on inferior side of penis

Neuromuscular/Reflexes

- Sucking/rooting
- Grasp
- Moro/startle
- Babinski
- Stepping/walking
- Tonic Neck

- SEE PAGES 703-706
Dubowitz/Ballard Scales

- Neuromuscular maturity (level of CNS maturity) is reflected in reflex development and sleep-wake cycles.
- Physical maturity (Ballard includes ratings for extreme prematurity).
- Accurate ± or – 2 weeks.
- SEE page 729. Infant is assessed in each parameter; scored like GPA.

Nursing Care

- Ineffective Airway Clearance
  - excessive mucous – suction with bulb syringe, position side-lying or supine.
- Impaired Gas Exchange
  - poor respiratory effort, blow-by oxygen; alert pediatrician/ NICU

Ineffective Thermoregulation

- increased RR/cyanosis are usually cold stress; skin-to-skin contact, cover with pre-warmed blanket (head too!), dried thoroughly?, radiant heat panel 37degrees, skin probe on abdomen!!!, check temp q hr. Watch out for toe counters!! AKA grandmothers…
Risk for Infection

- Eyes – chlamydia, gonorrhea
  - Ophthalmia Neonatorum – erythromycin to lower conjunctival sac within 2 hr birth
- Umbilical cord – treated with drying agent/antimicrobial at delivery (triple dye);
  - cleanse with alcohol every diaper change to keep clean, aid drying. Assess vessels, clamped until dry; diaper below cord!
- Walmart – don’t go there!! Handwashing!

Potential for hemorrhage

- Lack of Vitamin K for several days
- AquaMephyton IM – vastus lateralis; within 2 hr of birth

Potential for Jaundice

- Jaundice not normal in 1st 24 hours.
- Assess skin by blanching; head to toe.
- Central jaundice (abdo) mean bili too high
- Physiologic peaks at about 6mg/dl @72hrs
Discharge Planning

• New Parents License:
  ➢ Circumcision care – vaseline gauze, watch bleeding, s/s infection; keep clean
  ➢ Temperature taking – thermometer, axillary, how to read. Dress for environment.

New Parent License…

➢ Rashes – newborn or diaper?
➢ Cord Care – alcohol; diaper below
➢ Bathing - sponge bathe until cord falls off at 10-14 days. Avoid cold stress. How hot?
➢ Infant Cues and Clues – what to do for crying?
➢ Car Seat Safety – federally approved, rear facing, back seat installation until at least 1 year. No air bags in area of seat. Know laws/safety! Must have seat to go home!