Caring for the Complex Newborn

Palm Beach State College

Birth Weight

- Low birth weight (LBW) (<2500 g)
- Very low birth weight (VLBW) (<1500 g)
- Extremely low birth weight (ELBW) (<1000 g)

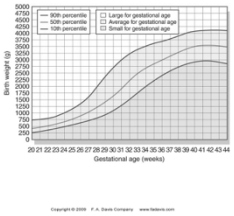
- Regardless of Gestational Age

Gestational Age (GA)

- Premature – born before 37 weeks of gestation
- Full Term – born between 38 and 42 weeks of gestation
- Post mature – born after 42 weeks of gestation

- Average gestational weeks to survive is 23-34 weeks

Size Categories



- SGA – Weight below the 10th% for gestational age
- AGA – Weight 10th to 90th % for gestational age
- LGA – Weight above the 90th % for gestational age

- SGA is NOT the same as preterm infant
- SGA is classified as slowed intrauterine growth

Small for Gestational Age (SGA)

Predisposing Factors:

- Systemic maternal conditions and teratogen exposure
- Uterine conditions
- Multiple fetal pregnancy (Twins, Triplets, etc)
- Genetics

- Suffered nutrition and oxygenated deficit in utero
- Examples:
  - Asthma
  - HTN
  - Diabetes
  - Lupus
  - Smoking
  - Congenital Heart Disease

Conditions affecting SGA neonates

- Hypothermia
- Hypoglycemia
- Polycythemia

- High Morbidity and Mortality Rate
- Hypothermia:
  - Decreased Body Fat
  - Increased Glycogen Storage
  - Temp less then 97 deg F
  - Artificial Heat Sources Needed
- Hypoglycemia:
  - Increased glucose needs
  - Glucose levels fall rapidly after birth
  - Levels must reach less than 60 mg/dl
- Polycythemia:
  - Increased RBC
  - Hematocrit >65%
  - Jaundice develops

Caring for the SGA neonate

Nursing Diagnosis
- Risk for activity intolerance r/t increased metabolic needs
- Risk for injury - hypothermia

Nursing Interventions
- airway management
- assess temperature
- assess for hypoglycemia
- daily weight & assess changes

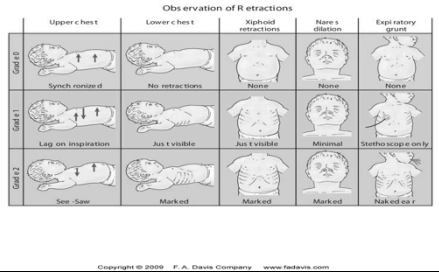
- ABCs
- SGA babies:
  - Increase Comfort and Warmth

Conditions Affecting LGA Neonates

- Chronic hyperglycemic state
- Transient tachypnea of the newborn (TTN)
- Hypoglycemia
- Hypocalcemia
- Hypomagnesemia
- Birth injuries
- Brachial plexus injuries
- Fractures

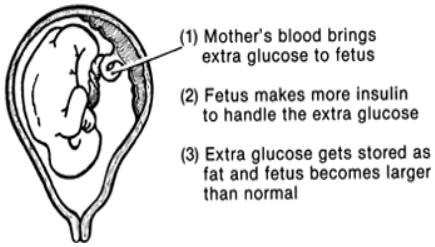
- Same as gestational age
- May not feed as well due to increased RR
  - 24-72hrs NPO to stabilize
- Many are delivered by C-Section

Transient Tachypnea of the Newborn (TTN)



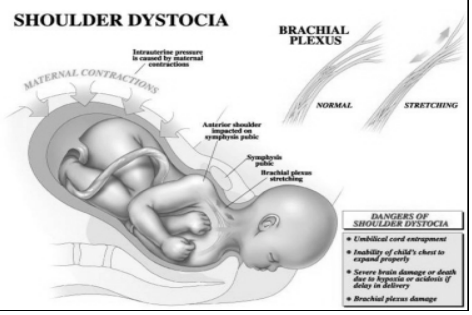
- Occurs in C-Sections Infants due to decreased compression through vaginal canal
  - Hard to feed

Large for Gestational Age



- Fetus makes more insulin
- Glucose is stored as Fat = Increased LGA
- Diabetic Mothers
- Physically Large but otherwise immature

Conditions Affecting LGA



- Shoulder gets stuck on pubic bone
- Assess clavicles and Moro Reflex
- Immobilize arm when swaddling

Caring for the LGA Newborn

Nursing Diagnosis

- Nutritional imbalance r/t hypoglycemia
- Pain alteration in comfort r/t birth injury
- Ineffective airway clearance r/t breathing transition at birth

Nursing Interventions

- Airway management
- Hypoglycemia assessment and management
- Birth injury assessment and management

= Priority

Conditions Affecting the Preterm Newborn

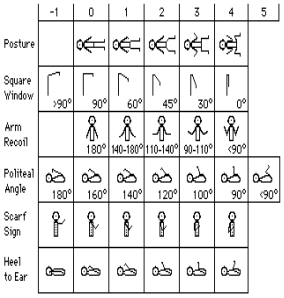
- Risk Factors
  - Maternal
  - Fetal

- <37 wks
- Shiny, loose thin skin
- Vessels prominent
- Narrow face
- Weak cry
- Observe for RD

Physical Characteristics of a Preterm Newborn

Body Part	28-33 weeks	34-36 weeks	37-38 weeks	39-40 weeks
Sole Creases	1-2 anterior transverse lines	Anterior 1/3 sole, anterior trans. lines	Anterior 2/3 sole, heel smooth	Creases length of sole
Breast tissue	None; nipple barely visible	Rarely exceeds 3 mm flat areola	4 mm avg.; raised areola	7 mm avg.; full areola
Ear Cartilage	Pinna soft; no recoil; stays folded	Returns slowly from folding	Thin cartilage; instant recoil	Thick cartilage; ear erect from head
Genitals (female)	Minora, clitoris prominent & folded	Majora and minora equal or almost equal	Majora almost covers minora	Majora covers minora and clitoris
Genitals (male)	Testes high in scrotum; few rugae	Testes high; rugae on small area, inferior aspect	Testes barely in; rugae fuller and deeper	Scrotum full; deep and extensive rugae

Gestational Age Assessment



- Rating Scale for Maturity

Conditions Affecting the Premature Newborn

- Respiratory Distress Syndrome (RDS)
- Apnea of Prematurity
- Jaundice
- Retinopathy of Prematurity
- Anemia of prematurity
- Sudden Infant Death Syndrome (SIDS)

Caring for the Preterm Newborn

Nursing Diagnoses

- Risk for infection r/t immature immune system
- Risk for activity intolerance r/t increased metabolic needs
- Ineffective thermoregulation r/t immature CNS
- Ineffective gas exchange

Caring for the Preterm Newborn

Nursing Interventions

- Manage airway through assisted ventilation
- Maintain temperature
- Prevent infection through barrier methods
- Minimize over-stimulation

- Special Needs:
  - Increased risk of other health complications
  - Decreased maturity of lungs
  - Susceptible to infections
  - Feeding issues
- Must give Synthetic Surfactant for lung expansion
- Premature babies are more at risk for Hypoglycemia
- ~~RDS is decreased surfactant production which causes lungs to collapse~~
- ~~Apnea:~~
  - ~~15-20 second pauses~~
  - ~~Must be on apnea and pulse ox monitoring~~
- SIDS
  - Must place babies on backs to sleep
  - Educate parents

Conditions affecting the Post-term Newborn

- Meconium aspiration
- Persistent Pulmonary Hypertension (PPHN)
- Shoulder Dystocia
- Birth Injuries

Caring for the Post-term Neonate

Nursing Diagnoses

- Ineffective breathing pattern r/t meconium aspiration
- Impaired Gas exchange

Nursing Management

- Suction
- Assist intubation
- Monitor oxygenation
- ECMO

Conditions Affecting the Term Newborn

- Hyperbilirubinemia
- Sepsis
- Maternal Drug Use

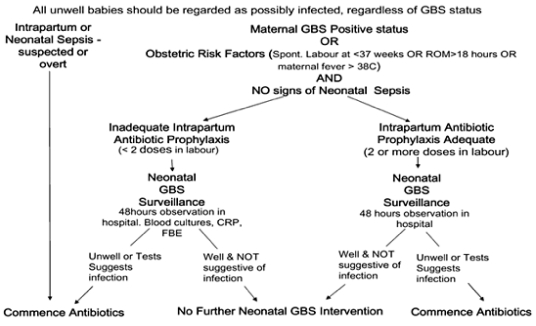
- Meconium is a blackish ~~greenish tar like first stool~~
- ~~Avoid bagging infant to prevent further inhalation~~
- ~~Secretions must be secreted~~ by ~~mouth and nares immediately~~
- ~~May develop pneumonia and PPHN (delay in circulation)~~
- Incidences of meconium aspiration increase with gestational age
- Babies may be hypoxic due to lack of oxygen intake
- Post Term Babies:
  - Decrease of vernix
  - Long Fingernails

Hyperbilirubinemia Physiologic vs Pathologic

Physiologic	Pathologic
• Immaturity of liver despite being full term • Dehydration due to small feeding or poor feeding pattern • Lasts on average 5 days without complication	• Due to hemolysis from ABO incompatibility • Infection or toxic disorder • Biliary atresia • Can have major consequences if untreated.

(See Note Page)

Neonatal Sepsis



- Preterm Labor
- Maternal Fever
- Ruptured Membranes
- Strep B Infections

Congenital Infections - TORCH

- Toxoplasmosis (pictured left)
- Other (Hepatitis)
- Rubella
- Cytomegalovirus
- Herpes

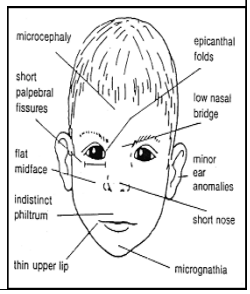
Drugs & Their Effect on the Neonate

Cross Placenta

- due to decreased molecular rate

Fetal Alcohol Syndrome (FAS)

- Craniofacial anomalies
- Microcephaly
- Hyperactivity
- Cardiac anomalies
- Failure to thrive
- Developmental delays, ADD



Cocaine Effect on the Neonate

- Abruption of Placenta, Preterm, SGA
- Microcephaly
- Poor feeding
- Irregular sleep patterns
- Hyperactivity, hypersensitive to noise
- Unconsolable
- Developmental delays
- Congenital anomalies

- Lab Tests Performed
- Drug Dependent Newborn:
  - constant irritability
  - unable to sooth due to withdrawal symptoms
    - Rock and Cuddle them
  - Give medication to decrease symptoms
    - Narcan (antidote for opiots)

- Abnormal smallness of the lower jaw

Heroin
Effect on the Neonate

- LBW, SGA
- Jitters, hyperactivity
- Poor suck, poor feeding
- Shrill, persistent cry
- Yawning, sneezing
- Abnormal sleep cycles
- Vomiting, diarrhea

Amphetamines
Effect on the Neonate

- SGA, prematurity
- Poor weight gain
- Drowsy
- Respiratory distress after birth

Marijuana & Tobacco
Effect on the Neonate

MARIJUANA

- LBW
- Possible neonatal tremors

TOBACCO

- LBW, preterm
- Increased risk of SIDS
- Increased risk of bronchitis,
- Pneumonia & ear infections
- Developmental delays

Newborn Anomalies Detected at Birth

Head / Facial
- Microcephaly
- Hydrocephaly
- Anencephaly
- Holoprosencephaly
- Cleft lip/palate

Respiratory
- Diaphragmatic Hernia
- Choanal Atresia
- Tracheo-Esophageal Fistula

Neuro
- Myelomeningocele
- Meningocele

Cardiac
- Patent Ductus Arteriosus
- Atrial Septal Defect / Ventricular Septal Defect
- Patent Foramen Ovale
- Tetralogy of Fallot
- Coarctation of the Aorta
- Pulmonary Stenosis
- Hypoplastic Left Heart

- Cleft Lip / Palate:
  - Maintain adequate nutritional needs
    - Tend to be poor feeders
    - Feed in an upright position

Newborn Anomalies Detected at Birth

Gastrointestinal
- Omphalocele
- Gastroschisis
- Inguinal Hernia
- Umbilical Hernia
- Imperforate anus

Musculo-Skeletal
- Congenital hip dysplasia
- Talipes Equinovarus
- Polydactyly / Syndactyly

- Gastroschisis:
  - Keep sterile
  - Keep infant supine
  - Surgery is performed immediately

Resucitation Equipment

- Suction equipment
- Ambu-bag
- Oxygen equipment
- Radiant warmer
- IV / UV access equipment
- NGT / OGT
- Meds (Narcan)
- Level III / Transport

- Make sure room is fully stocked and supplied
  - There, Ready, and Functional
- May be transported to NICU, another Facility, and with or without Mother

General Care of the High Risk Newborn/Family

- Use of thermo-regulating beds (isolettes/ warmers)
- Continuous Cardio-Respiratory/Oxymetry monitors
- Use of catheters to feed OG/NG
- Reverse Isolation precautions
- Strict I&O and frequent assessments
- Scheduled hands-on care to reduce stimulation
- Extensive parental teaching

Parenting the Parents of the Newborn at Risk

- Risk for impaired parenting r/t increased neonatal care needs.

- Weigh Diaper on Scale for Output
- To achieve Optimal Growth and Development of High Risk Newborn:
  - Minimal stimulation to reduce oxygen consumption
  - Cluster Care is essential
  - Limit:
    - Lighting
    - Handling of infant
    - Positioning of infant
    - Noise

Conditions affecting LGA Neonates:

- Transient tachypnea of the newborn (TTN):
  - Respiratory Distress
- Hypoglycemia
  - Frequent glucose checks
- Hypocalcemia
  - Watch for seizures
- Birth Injuries
  - Fractures

Hyperbilirubinemia

- Check Bilirubin levels frequently
- Bilirubin moves to:
  - skin
  - sclera
  - nail bed
  - body fluids
  - body tissues
- Physiologic jaundice disappears
- Pathologic lasts more then 7 days
- High Risk Levels require Phototherapy:
  - cover eyes and gentiles
  - frequent monitor of temperature
  - frequent position changes
  - adequate nutrition
    - promote stooling
    - prevent dehydration