ACUTE DISEASES OF THE NEWBORN

- high-risk neonate regardless of Gestational Age
- begins **23wks - 28 days post birth**

CLASSIFICATIONS OF HIGH RISK NB

According to Size

- Low Birth Weight **LBW** (<2.5kg)
- Very Low Birth Weight **VLBW** (<1.5kg)
- Extremely Low Birth Weight **ELBW** (<1kg)
- Appropriate for Gestational Age **AGA** (10%-90%)
- Small for Gestational Age **SGA** (<10%)
- Large for Gestational Age **LGA** (>90%)
- Intrauterine Growth Restriction **IUGR**

>*Risk Factors:*

- Hereditary
- Placental Insufficiency
- Maternal Disease

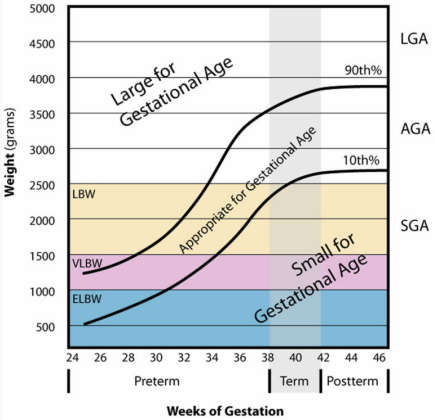
According to Gestational Age (*regardless of BW*)

- Late Preterm (**34-36wks AOG**)
- Preterm (**<37wks AOG**)
- Full term (**38-42wks AOG**)
- Post term (**>42wks AOG**)

According to Mortality

- Live Birth
- Fetal Death
  = death before 20wks
- Neonatal Death
  = death within first 27wks of extrauterine life
- Perinatal Mortality
  = total # of fetal & neonatal death/1000 live births
- Postnatal Death
  = death 28 days - 1y/o

Intrauterine Growth Curve



ASSESSMENT OF HIGH-RISK NB

1. Physical Assessment

- General Assessment
  > BW
  > Anthropometric Measurements
  > Deformities
  > Signs of distress (poor color, mottling, hypotonia)

2. Respiratory Assessment

- Chest Shape (barrel/concave)
- Describe use of accessory muscles
- Determine RR; O2 Sat
- Auscultation

3. Cardiovascular Assessment

- HR and rhythm
- Auscultation
- Determine Point of Maximal Impulse (PMI)
- Color
  > mucous membranes, lips, BP, perfusion

4. Genitourinary Assessment

- Genitalia and abnormalities
- Describe urine

ASSESSMENT OF HIGH-RISK NB (cont)

> amount, pH, specific gravity

5. Gastrointestinal Assessment

- Presence of abdominal distention, regurgitation
- Stool assessment
  > amount, color, consistency

6. Neurologic-Musculoskeletal Assessment

- Movements, Level of Activity with stimulation
- Changes in Head Circumference

7. Temperature

- Determine axillary temperature

HIGH-RISK CONDITIONS RT DYSMATURITY

1. Preterm Infants

- *Cause:*
  > idiopathic
- *Risk Factors:*
  > low socio-economic status
  > multigravida
  > gestational HTN
- *Characteristics:*
  > very small and thin; little SQ fat
  > proportionally large head
  > bright pink, shiny, smooth skin
  > abundant fine lanugo
  > ear cartilage soft and pliable
  > male NB = few scrotal rugae; cryptochordism
  > female NB = labia minora & clitoris prominent

2. Post-term Infants

- *Cause:*
  > idiopathic
- *Characteristics:*
  > absent lanugo

HIGH-RISK CONDITIONS RT DYSMATURITY (cont)

> abundant scalp hair; long fingernails
> cracked skin/parchment-like/desquamation
> depleted SQ fat
> little vernix caseosa

PROBLEMS RT GESTATIONAL WEIGHT

SGA RT Intrauterine Growth Restriction (IUGR)

- **Cause:**
> poor nutrition
> adolescent pregnancy
> placental anomaly
> maternal systemic disease (HTN, DM)
- **Diagnostic Evaluation**
> fundal height < expected
> UTZ = ↓ size; placental grading; amniotic fluid
> biophysical profile
> non-stress test (NST)
-**Fetal Implications**
> poor skin turgor
> large head, small body
> small liver
> skull sutures widely separated
> ↑ Hct level
> polycythemia (↑ RBC)
> hypoglycemia (<45mg/dL)

LGA (Macrosomia)

- appears healthy, but will soon reveal underdevelopment
- *Causes:*
> gestational DM (GDM)
> multiparity
> **Beckwith Syndrome** (overgrowth+macroglossia)
> congenital anomalies (omphalocele)
- *Diagnostic Evaluation*
> UTZ
> NST
> amniocentesis
- *Fetal Implications*
> immature reflexes
> extensive bruising/birth injury**Erb-Duchenne**
> caput succedaneum; cephalhematoma
> hyperbilirubinemia
> polycythemia vera
> cyanosis
> ↑ insulin (up to 24hrs post birth=hypoglycemia)

MANAGEMENT OF HIGH-RISK NEWBORN

NEWBORN PRIORITIES

1. ***Initiating/Maintaining Respiration***
- most deaths occur within 48hrs
- ineffective respiration = cerebral hypoxia
> Management:
- O2 administartion
- appropriate positioning to open airway
- resuscitation+ventilation
2. ***Establish Extrauterine Circulation***
> Management:

MANAGEMENT OF HIGH-RISK NEWBORN (cont)

- closed-chest massage (**1-2cm, 100x/min**)
- lung ventilation (**30x/min**)
- monitor pulse oximeter
- **0.1-0.3mL/kg Ephinephrine** may be sprayed on ET tube
- transfer to NICU

3. ***Maintain Fluid Balance***
> Management: (after initial resuscitation)
- Hypoglycemia (**D10W IVF**)
- Hypotension (vasopressor **Dopamine**)
- Hypovolemia (**NSS/RL IVF**)
- Dehydration (**RL/D5W IVF**)

4. ***Maintaining Thermoneutrality***
> Management:
- thorough drying
- skin-skin contact
- neutral thermal environment

5. ***Establishing Adequate Nutritional Intake***
> Management:
- parenteral/enteral nutrition
- breastfeeding

6. ***Establishing Waste Elimination***
- Immature infants void within 24hrs
- stool passage may be later than term infants

7. ***Protection from Infection***
> Prevention:
- handwashing and PPE use
- standard precautions
- physical isolation

8. ***Skin Care***
- ↑ skin sensitivity & fragility

MANAGEMENT OF HIGH-RISK NEWBORN (cont)

> Management:
- Zinc Oxide-based tape is used
- avoid use of solvents

9. ***Establishing Mother-Infant Bonding***
- parents kept informed
- spend time with NB

*2. (1:3 = Lung ventilation:Cardiac massage)
*3. Monitor UO (if UO=<2mL/kg/hr = inadequate fluid intake)
*4. 3 Main Methods for Neutral Thermal Environment: Incubator, Radiant panel, Bassinet
*5. If gavage fed, provide oral stimulation to develop effective sucking reflex

ACUTE CONDITIONS OF NEONATES

Respiratory Distress Syndrome (RDS)

- Hyaline Membrane Disease
- surfactant deficiency
- **Types:**
  > *Structural*
    - lungs are underdeveloped
    - respiratory muscle prone to fatigue
  > *Functional*
    - deficient surfactant
- **Risk Factors:**
  > Multifetal pregnancy
  > GDM
  > CS Delivery
  > Cold stress
  > Asphyxia
  > Hx of RDS
- RDS of Non-Pulmonary Origin Risk Factors:
  > Sepsis
  > Cardiac Defect
  > Hypoglycemia
  > Metabolic Acidosis

Respiratory Distress Syndrome (RDS) (cont)

> Drugs
- **Clinical Manifestations:**
  > tachypnea (>60cpm)
  > retractions; nasal flaring
  > inspiratory crackles
  > circumoral and central cyanosis
- **Laboratory Diagnoses:**
  > Glucometry (tests hypoglycemia)
  > ABG (tests acidosis, hypoxia, hyperc-apnia)
  > CXR
    - diffuse granular pattern = alveolar atelectasis
    - dark streaks = dilated, air-filled bronchioles
- **Treatment:**
  > ventilation and oxygenation with Continuous Positive Airway Pressure (CPAP)
  > maintain acid-base balance
  > neutral thermal environment
  > maintain hydration and electrolytes
  > avoid nipple and gavage feedings
  > administer exogenous surfactants
- **Nursing Responsibilities:**
  > collect and monitor ABG
  > O2 monitoring
  > assess tolerance on procedure/drug

* Surfactants produced at 24wks AOG, matures at 36wks
* Surfactant Complications: pulmonary hemorrhage; mucus plugging

Meconium Aspiration Syndrome

Meconium
- sticky and tarlike; present at bowel 10wks AOG
- accumulates at 16wks AOG

Meconium Aspiration
- occurs inside utero/at first breath at birth
- occurs when the vagus reflex is stimulated due to hypoxia → releasing meconium to amniotic fluid
- NB born at breech position
- **Pathophysiology:**
  > hypoxia → meconium passing → aspiration → obstruction → atelectasis → respiratory failure
- **Clinical Manifestations:**
  > tachypnea; retractions; expiratory grunting; nasal flaring
  > cyanosis/pallor
  > barrel chest (from hyperinflation)
  > hypoglycemia; hypocalcemia
- **Diagnostic Evaluation:**
  > laryngoscopy
  > CXR
- **Management:**
  > tracheal suctioning
  > intubation (in severe cases)
  > surfactant administration
  > Echocardiography (diagnose shunting)
  > chest physiotherapy

Apnea of Prematurity (AOP)

Apnea

- cessation of respiration that lasts **>20secs**, accompanied by bradypnea and cyanosis

Types:

1. Central Apnea

- absent function of diaphragmatic and other respiratory muscles
- CNS does not transmit signals to respiratory muscles

2. Obstructive Apnea

- airflow stops due to obstruction

3. Mixed Apnea

- central + obstructive
- most common on premature infants

- **Causes:**

> prematurity (weak thorax muscles)
> airway obstruction
> anemia; polycythemia vera
> hypoglycemia; hypocalcemia
> sepsis; meningitis; seizures

- **Management:**

> gentle tactile stimulation
> Caffeine Citrate PO/Parenteral (CNS Stimulant)
> monitor weight and UO (Caffeine citrate = diuretic)
> nasal CPAP & nasal intermittent positive pressure ventilation
> neutral thermal environment

- **Nursing Responsibilities:**

> routine observation (RR & HR)

Apnea of Prematurity (AOP) (cont)

> gentle tactile stimulation, if it fails, raise chin to open airway
> careful burping = reduces apnea
> never take rectal temperature