

# The Term Newborn

- Newborn – neonate.
- Infant Mortality – ratio between no of deaths of infants younger than 1yr during any given yr and no of live births occurring in same yr.
- Neonatal Mortality – death rate highest in first month. The first 24 hrs are most dangerous.
- Morbidity – state of being sick or diseased.
- Perinatology – study and support of fetus and neonate.
- Perinatal Mortality – fetal and neonate deaths related to prenatal conditions and delivery circumstances.
- Low birth weight newborns are major causes of infant morbidity.

# Nervous System : Reflexes

- Head Lag
  - Infant's head falls back when lifted from bed and cannot maintain neutral position of head.
- Moro Reflex
  - Infant is jarred, legs go up , arms fan out, and then come back to their midline.

# Nervous System: Reflexes

- Rooting reflex
  - Infants head turn in direction of anything that touches the cheek, in hopes of food. Use a lot with breastfeeding.
- Dancing Reflex
  - Prancing movement of legs, when infant is upright on examining table.

# Head

- Molding
  - Shaping of fetal head to conform to size and shape of birth canal.
  - Newborn's head is large compared to rest of body.
  - Head circumference – 12.5 to 14.1 in.

# Head

- Caput Succedaneum
  - Swelling of soft tissue
  - Cephalohematoma
    - Collection of blood beneath periosteum of cranial bone,
    - Will not cross suture line.

# Head

- Protect head during delivery by process of molding and allow for further brain growth during next 1 ½ yrs.
- Anterior Fontanel
  - Diamond shape.
  - Close around 12 to 18 months.
  - Flat and open
- Posterior Fontanel
  - Smaller than anterior
  - Closes in third month.
  - Flat and open.
- COVERED WITH TOUGH MEMBRANE – LITTLER CHANCE OF BEING INJURED DURING CARE.

# Visual Stimulation And Sensory Overload

- General Overview
  - Newborn can fix and see on points of contrast.
  - Toys that make sounds and have different colors attract newborn.
  - Tears are absent in newborn and appear when infant cries at 1 to 3 months.

# Hearing

- General Overview
  - Low set of ears – indicate congenial abnormality.
  - An imaginary line drawn from outer canthus of eye that should be even with upper ear lobe.
  - Will react to sudden sound b an increase in pulse and resp or become startled.
  - Can determine mothers voice from first day and others by three days.

# Hearing

- Algo Hearing Test
  - Series of clicks in infants ears while sleeping.
  - Brain responds to brain wave known as auditory brainstem response.
  - Compared by computer to normal responses.
  - It is a pass or fail score.
- Ears and nose have no specific attention other than cleansing with a soft cloth at bath.
- Do not insert any cotton tips in ears.

# Sleep

- Phases
  - There are many phases the newborn goes through.
  - They will sleep about 15 to 20 hrs a day.

# Pain

- Neuroceptors
  - Fibers that conduct pain stimuli to spinal cord in early fetal life.
  - Heart rates and resp go up .
  - BP increases and bld glucose rises.
  - Should be medicated for discomfort.

# Pain

- Evaluate
  - Assess VS.
  - Assess behavior of infant.
    - Need to
      - Swaddle infant.
      - Cuddle
      - Rock
      - Quiet environment
      - Oral sucrose – pain reliever during minor surgery.

# Neonatal Behavioral Assessment Scale

- Factors
  - Tested on alertness, responsive to visual and auditory stimuli, motor coordination, level of excitement, and response to stress.

# Respiratory System

- Once umbilical cord is clamped and cut – lungs take on function needed for breathing in O<sub>2</sub> and removing CO<sub>2</sub>.
- First breath helps to expand lungs.
- Full expansion does not occur for few days.
- Infants cry should be strong and healthy.
- Most critical time – first few hrs.
- Place infant on side.
- Dress to maintain warmth while allowing full expansion of lungs.
- Record VS and suction as needed.
- Sternal or chest retractions should be reported immed after delivery because it indicates resp distress.

# Apgar Score

- Method of evaluating newborn's condition after birth.
- Five objectives
  - Heart rate
  - Respirations
  - Muscle Tone
  - Reflexes
  - Color

# Apgar Score

- Newborn is observed very closely.
- Any signs of sternal retractions indicate resp distress.
- Mucus should be removed by using a sterile gauze or bulb syringe.
- Parents should be taught to use bulb syringe.

# Circulatory System

- Once umbilical cord is cut, supply of oxygen from mother is stopped.
- Infant now depends on his own systemic and pulmonary circulation.
- Newborn has 300 ml of circulating bld volume.
- Fetal circulation is stopped as soon as infant is born.

# Circulatory System

- Murmurs – bld leaks through openings that have not yet closed.
- Functional – innocent.
  - Due to sound of blood passing through normal valve.
- Organic –improper heart formation.
  - Due to bld passing through abnormal openings.

# Providing Warmth

- Normal Temperature
  - Falls immed after birth to about 96.
  - In few hrs, it climbs to 898 to 99.
  - Mom's room should be kept at 69 to 75.
  - Room must be fresh and should have no drafts.

# Promoting Warmth

- Acrocyanosis
  - Blue color to extremity.
  - Can be due to sluggish peripheral circulation.
  - Newborn cannot adapt to changes in temp.
  - Baby is in blanket whenever not in nursery.
  - Sweat glands do not function effectively during neonatal period.
  - Newborn is at risk for developing an elevated temp if overdressed or if placed in an overheated environment.

# Obtaining Temperature, Pulse, And Respirations

- Route
  - Initial temp –rectally to see rectum patent.
  - Routine temps – axillary.
- Normal
  - Pulse and resp taken one full minute.
  - Normal pulse – 110 to 160.
  - BP – low and varies in size of cuff – 80/46.
  - Resp – 30 to 60.

# Musculoskeletal System

- Newborn Bones
  - Soft and composed mostly of cartilage.
  - Bones easily molded by pressure, therefore infant's position must be changed frequently.
  - If infant lies in one position, bones of head can become flattened.

# Musculoskeletal System

- Newborns lack muscular control to hold head steady.
- Muscular control proceeds from head to foot and from center of body to periphery.
- Infant will hold head up before sitting erect.
- Head and neck muscles are first ones under control.

# Musculoskeletal System

- Eyes appear cross – eyed because their muscle coordination is not fully developed.
- Eyes appear blue or gray, permanent coloring becomes fixed between 6 to 12 months.
- Eyelids are closed most of the time.
- Tears do not appear until 1 to 3 months - immature lacrimal gland ducts

# Musculoskeletal System

- Tremors of lips and extremities during crying are normal.
- Bath is excellent time for newborn to exercise and stimulation to the newborn.

# Length And Weight

- Average Wt
  - 6 to 9 lbs.
- Average Height
  - 19 to 21 inches.
- Normal Loss
  - Within first 3 to 4 days after brth, infant loses about 5 to 10 % of birth weight.
  - Weight will normalize after 3 to 4 days.
  - At 10 days of age, newborn will regain his birth weight.

# Newborn Assessment

- Teaching the Mother
- Head To Toe

# Preterm Newborn

- Physical Characteristics
  - Transparent and loose.
  - Superficial veins seen under abd and scalp.
  - Lack subcutaneous fat.
  - Fine hair covers forehead, shoulders, and arms.
  - Cheeselike vernix – abundant.
  - Extremities appear short.
  - Soles of feet have fewer creases.
  - Abdomen protrudes
  - Nails short.
  - Genitalia small.

# Preterm Newborn

- Skin
  - Higher bilirubin level and deeper jaundice – greater risk of neurological damage.
  - Risk for heat loss due to their heat regulating center in brain is immature.

# Preterm Newborn

- Respiratory
  - Risk for resp distress – deficiency of surfactant.
  - Nasal flaring, sternal retractions, or grunting – indication resp distress.
  - Placed on apnea monitor.
  - During apneic episode, Mom should rub infant's back ankles and feet to stimulate breathing.
  - Kept away from anyone with colds.
  - Infant placed on O<sub>2</sub> should have arterial blood gases and pulse oximeter. They can become blind if they receive high levels of O<sub>2</sub>

# Preterm Infant

- Hypoglycemia
  - Due to not being in utero enough to acquire enough glycogen and fat.
  
- Hypocalcemia
  - Transport to placenta in third trimester.
  - Will need IV calcium gluconate.
  - Must be careful of newborn developing bradycardia.

# Preterm Infant

- Feedings
  - Many newborns lack sucking reflex or just too weak to eat.
  - Put on gavage feeding first few days of their lives.
  - When giving gavage feeding, must aspirate stomach feedings before starting.
  - Newborn will choke.
  - To stimulate infant, give a pacifier during feedings.

# Preterm Infant

- Bowel
  - May see bloody stools, abd distention, diarrhea, or vomiting.
  - These are signs of necrotizing enterocolitis.
  - Mostly seen with gavage feedings.
- Family Reactions
  - Need to be told if their child doesn't have any defects or complications, their child will reach that of a full term baby at age of 2.

# Post Term Infant

- Physical Characteristics
  - Long and thin.
  - Looks like weight has been lost.
  - Skin is loose esp about thighs and buttocks.
  - Little lanugo and vernix caseosa.
  - Loss of cheese – like vernix leaves skin dry, cracks, peels, and has a parchment texture.
  - Nails are long and may be stained with meconium.
  - Thick hair.
  - Looks alert.

# Post Term Infant

- Risks
  - Placenta does not function as well as it ages which results in fetal distress.

# Newborn Congenital Malformation

- Hydrocephalus
  - Increase of cerebrospinal fluid in ventricles of brain.
  - Can be congenital or acquired.

# Newborn Congenital Malformation

- S&S
  - Increased head size.
  - Fontanel bulge.
  - Scalp – shiny.
  - Veins dilated.
  - Infant helpless and lethargic.

# Newborn Congenital Malformation

- Treatment
  - Lasix to reduce CSF.
  - Treatment of choice – surgery to place a shunt.
  - Without too much damage prior to surgery, prognosis is good.
- Post Op
  - ICP
  - Infection – bacterial – remove shunt – can be life threatening.

# Spinal Bifida

- Known as divided spine.
- Congenital neural tube defect – imperfect closure of spine.
- Most serious – meningocele – serious protrusion of membranes and spinal cord.

# Spinal Bifida

- Prevention
  - Unknown.
  - Uses of drug early pregnancy and poor nutrition may cause it.
  - Importance of taking folic acid early in pregnancy.
- Treatment
  - Surgical closure.
  - Prognosis depends on extent of involvement.
  - Habilitation – learning from birth since they are disabled and never knew how to walk.

# Cleft Lip, Cleft Palate, and Cleft Foot

- review pgs -327 – 330.

# Metabolic Defects

- Phenylketonuria (PKU)
  - Faulty metabolism of phenylalanine – amino acid that is essential to life and is found in all protein.
  - Blood levels – above 20 mg/dl.
  - Results – severe retardation.
  - By time urine is positive – brain damage has occurred,
  - Infant appear normal at birth, but begins to show delayed development by 4 to 6 months.
  - Failure to thrive, eczema, musty odor, personality disorders.
  - May see seizures.
  - Seen mostly in blond, blue – eyed children.
  - Due to lack of tyrosine – necessary component of pigment melanin.

# Metabolic Defect

- PKU

- Diagnosis

- Guthrie blood test.
    - Heel stick.
    - 48 to 72 hrs after birth.
    - Like to give infant injected proteins , that way it will not give a false-negative reading.
    - Can be repeated 2 wks after born.

# Metabolic Defects

- PKU

- Treatment

- Dietary management.
    - Essential proteins to support growth and development.
    - Assessing PKU levels.
    - Levels below 2mg/dl may result in growth retardation.
    - Levels above 10 mg/dl may result in brain damage.
    - Dietitian works with family closely to keep levels within normal range.
    - Genetic counseling – future teaching.
    - Kept on low PKU diet before conception to avoid brain damage of fetus during development.

# Chromosomal Abnormalities

- Down Syndrome
  - 9 in 10,000 births.
  - 1 in 365 births who mothers are 35 and older.
  - Father who is 55 yrs old and older.
  - Screening – 15 weeks – Alpha Feta Protein, hCG, and Estriol –triple test.
  - Increases in nuchal fold thickness on US abd.

# Chromosomal Abnormalities

- Down Syndrome

- S/S

- Upward slanting eyes.
    - Small head and round face.
    - Flat nose.
    - Protruding tongue that interferes with sucking and mouth breathing.
    - Hands- short and thick, little fingers, straight line across palm – simian crease.
    - Undeveloped muscles and loose joints – enable to assume unusual positions.

# Chromosomal Abnormalities

- S/S
  - Limited intelligence.
  - Congenital heart deformities.
  - Very lovable but also very mean.
  - Poor resistance to infection.
  - Resp and ear infections.
  - Speech and hearing problems.
  - Life span has increased with widespread of antibiotics.
  - Limp posture makes it difficult to feed these babies.

# Chromosomal Abnormalities

- PKU
  - Nursing Care
    - Counseling
    - Encourage parents to express feelings and concerns.
    - Open communication early on will make transition period a little easier.
  - Resp problems – accumulation of mucus – bulb syringe.

# Phototherapy

- Reduce serum bilirubin levels.
- Newborn – placed in incubator under lights.
- Eyes and gonads are protected.
- Remember it is not the treatment for any underlying jaundice.
- Have to make sure child is hydrated before putting under lights.
- Bilirubin level on newborn 6mg/dL.
- In 7 days 12mg/dL.
- 3months 1mg/dL.
- Blood transfusion.