CARE OF HIGH RISK NEWBORN

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INTRODUCTION

- Early identification of high risk fetus and optimal care of high risk fetus and neonates are matter of utmost importance if the levels of perinatal morbidity and mortality are to be reduced.
- Threats to wellness and indeed life can occur at any time prenatally, perinatally and postnatally, between the time of viability of fetus to 28 days after birth.

The Following Babies are Transferred to the Special Care Nursery For Better Supervision and Management Without Unnecessary Delay:

1. Birth weight less than 2000 gm.
2. Gestational age less than 36 weeks.
3. Severe birth asphyxia with 5 minutes APGAR score of 3 or less.
4. Rh-Incompatibility.
5. Gross Congenital Malformations.
6. Maternal Diabetes Mellitus.
7. Respiratory Distress.
8. Alae nasi movements (nasal flaring).
9. Chest retraction.
10. Superficial infections: oral thrust, umbilical sepsis,pyoderma, abscess.
11. Vomiting
12. Diarrhea
13. Abdominal distension.

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14. Delayed passage of meconium (more than 24 hrs).and urine (more than 48 hrs).
15. Inability to suck or swallow.
16. Reduced activity or excessive crying.
17. Marked changes in color: pale, blue, yellow, cold baby, febrile baby.
18. Rapid breathing more than 60 breath per minutes.
19. Bleeding
20. Convulsions.
21. Delayed CRT.
22. Bulging fontanel.
23. Depressed fontanel.
24. Loss of weight.
25. Congenital anomalies

NURSING MANAGEMENT OF A LOW BIRTH WEIGHT BABY

DEFINITIONS

A variety of factors identifies a pregnancy as high risk and frequently result in a high risk fetus.

1. **LOW BIRTH WEIGHT(LBW):** Low birth weight is defined as weight at birth of <2500 gram(2.5 Kg).

- Infants who weight 2500 gram or less at birth regardless of gestational age.

2. **VERY LOW BIRTH WEIGHT INFANT (VLBW):** a baby whose birth weight is less than 1,500g (< 1.5 kg).

3. **EXTREMELY LOW BIRTH WEIGHT(ELBW) INFANT:** A baby whose birth weight is less than 1,000 g (<1 Kg).

4. **INTRA UTERINE GROWTH RETARDATION:** Babies who do not grow adequately in utero.

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5. **APPROPRIATE FOR DATES(AFD) BABIES:** Babies with a birth weight between 10th to 90th percentile for the period of their gestational age. The are also termed as **Appropriate For Gestational Age** (AGA).
6. **Small For Gestational Age(SGA)OR Small For Date (SFD):** Infants whose birth weight falls below the 10th percentile on intrauterine growth chart.
7. **Premature(preterm) infants:** It is defined as babies born alive before 37 weeks of pregnancy are completed(<259 Days).

CLASSIFICATION

On basis of gestational age and birth weight

PRETERM:

- Small for date
- Appropriate for date
- Large for date.

TERM

- Small for date
- Appropriate for date
- Large for date

POST TERM

- Small for date
- Appropriate for date
- Large for date

LBW is of 2 Cinical types.

- Preterm.
- Small for date/small for gestational age.

CLASSIFICATION OF PRETERM

- **Late Preterm:** born between 34-37 weeks of pregnancy.
- **Very Preterm:** born at less than 32 weeks of pregnancy
- **Extremely Preterm:** born at less than 25 weeks of pregnancy.

Characteristics of Preterm

FEATURES	SPECIFICATIONS
Size	A preterm baby is small in size, usually less than 47 cm and weight less than 2.5 kg
Posture	The preterm infant lies in a "relaxed attitude", limbs are extended
Head	The head is relatively large, sutures are widely separated and fontanels are large
Hair	Hairs of preterm are fine, fuzzy, and wooly
Skin	Skin of preterm is thin, pinkish and appears shiny due to generalized edema. It is covered with abundant lanugo and there is little vernix caseosa
Ear	In preterm infants, ear cartilage is poorly developed and ear may fold easily
Breast	The breast nodule is absent or less than 5 mmwide

Cont...

FEATURES	SPECIFICATIONS
Sole	The sole of foot of preterm infant appears more turgid and may have only fine wrinkles. The creases are absent.
Female genitalia	The female infant's clitoris is prominent and labiamajora are poorly developed and gaping
Male genitalia	In preterm male infant, the scrotum is undeveloped and not pendulous, minimal rugae are present and testes may be in the inguinal canal or in the abdominal cavity
Scarf sign	In preterm infants, elbow may be easily brought across chest with little or no resistance.
Heel to ear maneuver	The preterm infant's heel is easily brought to the ear, meeting with no resistance

ETIOLOGY OF PRETERM BIRTH

- The etiology of preterm birth is multi-factorial and involves a complex interaction between fetal, placental, uterine and maternal factors:
- **Fetal factors**
- Fetal distress
- Multiple gestation.
- Erythroblastosis fetalis
- Nonimmune hydrops

Placental factors

- Placental dysfunction
- Placenta previa
- Abruptio placentae

Uterine factors

- Bicornuate uterus
- Incompetent cervix

Maternal factors

- Preeclampsia
- Chronic medical illness (renal or heart disease)
- Infections [Listeria monocytogenes, group Streptococcus, urinary tract infection (UTI), bacter vaginosis, etc.]
- Drug abuse (cocaine)

Cont…

Other factors:

- Premature rupture of membrane.
- Polyhydramnios.
- Iatrogenic
- Trauma.

Physiological Handicaps of Prematurity or Problems Associated with Prematurity

The problems or handicaps of preterm babies are as follows:

Respiratory problems

- Hyaline membrane disease
- Bronchopulmonary dysplasia
- Pneumothorax
- Pneumonia
- Apnea

Cardiovascular problems

- Patent ductus arteriosus
- Hypotension
- Bradycardia

Gastro-intestinal problems

- Poor gastrointestinal function.
- Necrotizing enterocolitis
- Hyperbilirubinemia
- Incompetent cardioesophageal sphincter leading to regurgitation.

Central nervous system problems

- Intraventricular hemorrhage
- Seizures
- Retinopathy of prematurity
- Deafness.
- Hypotonia

Cont…

Problems associated with renal system

- Hyponatremia/Hypernatremia
- Hyperkalemia
- Renal tubular acidosis
- Renal glycosuria
- Edema

Other problems

- Hypothermia
- Nutritional deficiencies
- Increased susceptibility to infections

Test and Diagnosis

- After the preterm baby is moved to NICU, the baby may go through number of tests.
- Some are ongoing, while others may be performed only if the NICU staff Suspects a particular complications.

Assess Gestational Age

- Postnatal methods of determining gestational age in premature infants have been developed and validated.
- The **NEW BALLARD SCORE** allows for gestational assessment in infants as early as 20 weeks' gestation, and uses parameters of physical (6 criteria) and neurologic (6 criteria) maturity to reach a score that correlates with gestational age.

The physical maturation criteria are:

- Skin
- Ear/eye
- Lanugo Hair
- Planter Surface
- Breast Bud
- Genitals

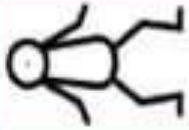
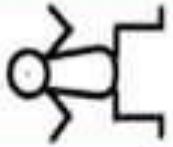
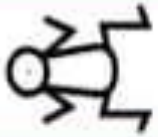
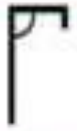
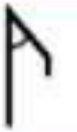
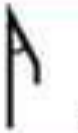
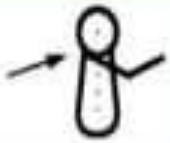
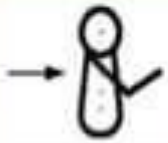
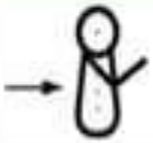
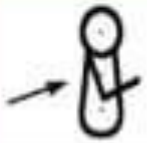
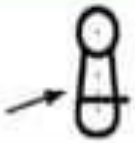
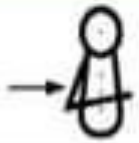
Physical Maturity

Skin	Sticky, friable, transparent	Gelatinous, red, translucent	Smooth, pink; visible veins	Superficial peeling and/or rash; few veins	Cracking, pale areas; rare veins	Parchment, deep cracking; no vessels	Leathery, cracked, wrinkled
Lanugo	None	Sparse	Abundant	Thinning	Bald areas	Mostly bald	
Plantar surface	Heel-toe 40–50 mm: −1 <40 mm: −2	>50 mm, no crease	Faint red marks	Anterior transverse crease only	Creases anterior 2/3	Creases over entire sole	
Breast	Imperceptible	Barely perceptible	Flat areola, no bud	Stippled areola, 1–2 mm bud	Raised areola, 3–4 mm bud	Full areola, 5–10 mm bud	
Eye/Ear	Lids fused loosely: −1 tightly: −2	Lids open; pinna flat; stays folded	Slightly curved pinna; soft; slow recoil	Well curved pinna; soft but ready recoil	Formed and firm, instant recoil	Thick cartilage, ear stiff	
Genitals (male)	Scrotum flat, smooth	Scrotum empty, faint rugae	Testes in upper canal, rare rugae	Testes descending, few rugae	Testes down, good rugae	Testes pendulous, deep rugae	
Genitals (female)	Clitoris prominent, labia flat	Clitoris prominent, small labia minora	Clitoris prominent, enlarging minora	Majora and minora equally prominent	Majora large, minora small	Majora cover clitoris and minora	

Maturity Rating

Score	Weeks
−10	20
−5	22
0	24
5	26
10	28
15	30
20	32
25	34
30	36
35	38
40	40
45	42
50	44

Neuromuscular Maturity

Score	–1	0	1	2	3	4	5
Posture							
Square window (wrist)	 >90°	 90°	 60°	 45°	 30°	 0°	
Arm recoil		 180°	 140–180°	 110–140°	 90–110°	 <90°	
Popliteal angle	 180°	 160°	 140°	 120°	 100°	 90°	 <90°
Scarf sign							
Heel to ear							

SCORING

$$\text{Age} = \frac{(2 \times \text{score} + 120)}{5}$$

POSSIBLE TEST FOR PREMATURE BABY

- Breathing and heart rate monitor
- Fluid input and output
- Blood tests
- Echocardiogram
- USG
- Eye Examination

PRINCIPLES OF MANAGEMENT OF LOW BIRTH WEIGHT

- **Care at birth:** suitable place for delivery, optimal facilities for handling LBW baby. If preterm labor is indicated administer **Betamethasone** (12mg IM in two divided dose at interval of 18 hours) or **Hydrocortisone** (100mg to mother to improve lung maturity to reduce RBS).
- **Appropriate place of care:**
  - If birth weight >1800 g-home care if well (Level-I).
  - If birth weight 1,500-1,800g- secondary level new born care (level-II).
  - If birth weight <1,500g-tertiary level newborn care (Level III)

Cont….

- **Thermal protection:** delayed bathing, skin to skin contact, warm deliver room, external heat source.
- **Nutrition:** IV Fluids, EBM with NG Tube or Katori spoon feeding.
- **Monitoring and early detection of complications:** Vitals Monitoring, Biochemical monitoring.

APPROPRIATE MANAGEMENT OF SPECIFIC COMPLICATIONS ESPECIALLY INFECTION: *Nursing interventions following these principles are as follows*

- Nursery Care
- Thermal Control :Being placed in an incubator, KMC
- Monitoring vital signs
- Phototherapy
- Receiving a blood transfusion
- Discharge and follow up.

Feeding: Guidelines for modes of feeding in LBW Babies.

AGE	Categories of Neonates		
Birth weight	**<1,200 g <30 weeks**	1200-1800g 30-34 weeks	**<1800 <34 weeks**
Initial	IV Fluids & try gavage feeds if baby is well	Gavage feeds	Breast feeding or Gavage feeding
After 1-3 days	Gavage feeds	Katori-spoon feeding	Breast feeding
2-4 weeks	Katori-spoon feeding	Breast feeding	Breast feeding
4-6 weeks	Breast feeding	Breast feeding	Breast feeding

Nutrition: Recommended for stable preterm baby weighing more than 1 Kg (Nutrition per 100 Kcal

NUTRIENTS	REQUIREMENTS
Water	125-167ml
Energy	100KCal
Protein	2.5-3g
Lactose	3.2-9.8
Vitamin A	583-1250 IU
Vitamin D	125-333 IU
Vitamin E	5-10 IU
Vitamin K	6.66-8.33g
Calcium	100-192 mg
Phosphorus	50-117 mg
linoleic acid	0.44-1.7g
Linolenic acid	0.11-0.44 gm

Fluid Requirement

	Fluid(ml/Kg/Day		
Day of Life	Birth Weight >1,500 g	Birth Weight >1,000 – 1,500 g	Type of Fluid
1	60	80	10% dextrose
2	75	98	10% dextrose
3	90	110	NS in 10% Dextrose
4	105	125	NS in 10% Dextrose
5	120	140	NS in 10% Dextrose
6	135	155	NS in 10% Dextrose
7	150	170	NS in 10% Dextrose

MEDICATIONS

- Surfactant
- Fine Mist (aerosolized) or IV medication to strngth breathing and heart rate.
- Antibiotic
- Diuretics
- An injection of medication into eye to stop the growth of new blood vessels.
- Paracetamol for patent ductus arteriosus in preterm

Surgical Management

- Necrotizing Enterocolitis: bowel ressection with enterstomy, necrostomy,fasciotomy.
- ROP: Laser surgery or photocoagulation or intra-vitreal anti - VEGF(Vascular Endothelial Growth Factor) theray..
- Patent ductus arteriosis: transection or ligation of patent ductus arteriosis via a lateral thoracotomy.

MANAGEMENT OF COMPLICATIONS

A. Infection
B. Metabolic derangements
C. Neonatal jaundice
D. Hematological abnormalities: polycythemia, anemia.
E. Retinopathy of prematurity.

WHEN TO TAKE THE BABY HOME:

- The baby is ready to go home whe he/she:
- Can breathe without support
- Can maintain a stable body temperature
- Can breast or bottle feed
- Is gaining weight steadily
- Is free of infection.

HOME MANAGEMENT

- Understand how to care for the baby
- Discuss feedings.
- Protect the baby's health.
- Follow a recommended schedule for checkups
- Stay on top of vaccination.
- Monitor for developmental delay.
- KMC

STRATEGIES TO REDUCE INCIDENCE OF LOW BIRTH WEIGHT BABIES

- Provide optimal nutrition and health care to girl children throughout their lifecycle.
- Avoid early marriage and teenage pregnancy
- Provide pregnancy related health checkup, general and nutritional guidance.
- Ensure inter-pregnancy interval of at least 3 years.
- Provide optimal and good quality care to all pregnant mothers.
- Enhance calorie intake, ensure balanced protein intake and provide supplements of iron folic acid and micronutrients during pregnancy.
- Avoid smoking, tobacco and substance abuse.
- Early detection of pregnancy complications.
- Avoid physical labour, emotional stress and sex during third trimester.

THANK YOU