

FEEDING OF PRE TERM INFANTS

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INTRODUCTION:

- **Proper nutrition in infancy is essential for normal growth, resistance**
- to infection, long term health and optimal neurologic and cognitive development.
- Providing adequate nutrition to preterm infants is challenging because of several
- problems, some of them unique to these small infants. These problems include
- immaturity of bowel function, inability to suck and swallow, high risk of necrotizing
- enter colitis (NEC), illnesses that may interfere with adequate enteral feeding (*e.g., RDS,*
- patent ductus arteriosus) and medical interventions that preclude feeding (*e.g., umbilical*
- vessel catheters, exchange transfusion, indomethacin therapy).

CONTRA-INDICATIONS TO FEEDING

- **Do not start feeds if the infant:**
- **is receiving indomethacin, or received it within the previous 48h**
- **has a hemodynamically significant patent ductus arteriosus**
- **has either an umbilical arterial or venous catheter. Do not start feedings until the**
- **catheters have been removed for ≥ 8 h.**
- **is polycythemic.**
- **has significant metabolic acidosis.**
- **has severe respiratory instability or there is impending endotracheal intubation**

- **• has hemodynamic instability as evidenced by clinical signs of sepsis, hypotension,**
- **is receiving dopamine (at a dose >3 mcg/kg/min) or other vasopressor drugs**
- **• received an exchange transfusion within the past 48h.**
- **• has abdominal distension or other signs of GI dysfunction.**
- **• has had an episode of severe asphyxia (perinatal or post-natal) in the previous 72h.**

FEEDING PROTOCOL:

- **The following are guidelines for the initiation and advance of**
- enteral feedings in preterm infants:
- **1. Method of feeding: Because these infants usually have not yet developed coordinated**
- sucking and swallowing, they must be fed by gavage:
- Orogastric tubes are usually used. Because infants are obligate nose breathers, it
- is best not to occlude the nares with a tube. In addition, repeated insertion of a
- nasal gastric tube can cause inflammation of the nose with subsequent
- obstruction.
- -Estimate length of tube that must be inserted to reach the stomach.
- -Insert the tube and aspirate to see if gastric contents are returned. While listening

- over stomach with stethoscope, inject ~5cc of air. If tube is in stomach, you
- should hear bubbling as you inject air. If you cannot hear any bubbling, tube
- may be in the trachea. Therefore, do not feed infant until you are certain that
- tube is in stomach.
- -Do not use duodenal or jejunal tubes for gavage feedings as feedings are less
- well tolerated and do not stimulate secretion of lingual lipase. In addition,
- residuals are no longer useful in assessing tolerance of feedings.
- -Nipple feedings can be considered as the infant matures. The best judge of when
- to start nipple feedings is an experienced Nurse.

2. Content of feeding:

- **Begin with either:**
- **-Breast milk (preterm breast milk is 290 mosm/L) or**
- **-Formula for preterm infants (e.g., *Premature Enfamil™* or *Similac Special***
- **Care™, 260 mosm/L).**
- **-Some physicians use half-strength feedings, but there is no evidence that this is**
- **beneficial. In fact, hypo-osmolar solutions may slow gastric emptying, leading**
- **to increased incidence of residuals and feeding intolerance.**
- **-Remember that fetuses swallow amniotic fluid, which is 275 mosm/L, and this**
- **swallowing begins at 16 weeks gestation**

3. Guidelines for Feeding

- **Initiation of feedings, their volume and the rate of advance**
- of feedings are related to birth weight, gestational age and how the infant has tolerated
- feeds to date. General guidelines include:
- **Initial volume is 2 cc/kg per feeding with a minimal absolute volume of 2 cc**

- **•Do not advance feedings faster than 20 cc/kg/d.**
- **•Do not advance feedings if there are any signs that the baby is not tolerating**
- **feeds. Aggressive advances of feedings increase the risk of NEC.**
- **•A small volume, even if not advanced, is much better than nothing at all. Even very**
- **small volumes stimulate maturation of gut motility and production of enteric**
- **peptides.**

- Bolus feedings are preferable to continuous feedings.
- The goals for “full feedings” are:
- Volume: 150-160 cc/kg/d
- Calories: 110-120 kcal/kg/d
- Some SGA infants will require a higher caloric intake to achieve consistent
- weight gain.

- **FORTIFYING FEEDINGS not only provides more calories but also improved intake**
- of calcium, phosphorus and protein. Fortify feedings (breast milk and formula) as follows:
- When infant is tolerating ≥ 100 cc/kg/d, feedings may be fortified to 22 cal/oz.
- When infant has been tolerating ≥ 150 cc/kg/d for at least 2d, feedings may be
- fortified to 24 cal/oz.

- **INTOLERANCE TO FEEDINGS is common among very small preterm infants, and**
- most such infants will have episodes that require either temporary discontinuation of
- feedings or a delay in advancing feedings. Although most episodes resolve
- spontaneously and without sequelae, any signs of feeding intolerance should be regarded
- as potentially serious because of the increased risk of NEC among these infants. Signs

- that indicate possible intolerance of feeding include:
- Gastric residuals or emesis -Abdominal distension
- Blood in the stool (gross or occult) -“Loose stools” or diarrhea
- Metabolic acidosis -Temperature instability
- Onset of apneic episodes -Hyperglycemia

MANAGEMENT OF FEEDING INTOLERANCE should be related to the type and

severity of the presenting signs, as described below:

1. Gastric residuals:

- Non-bilious residuals:

-If these are smaller than the volume of a feeding and are not increasing in

volume, and if the infant otherwise appears well, feeding can continue but the

infant should be observed carefully for other signs of feeding intolerance. If

the infant has any other worrisome findings, hold the feedings, consider

obtaining an abdominal radiograph and observe the infant.

- -If the residuals are greater than the volume of a feeding or are progressively
- increasing in volume, hold the feedings and observe closely.
- •Bilious residuals are a serious sign. Hold feedings, evaluate infant closely, and
- consider further workup including abdominal radiograph, CBC and platelets.

2. Abdominal distension is a serious sign. Discontinue feedings, obtain abdominal

- radiograph, and consider further evaluation and treatment (see section on NEC, P. 133).
- **3. Blood in stools: Discontinue feedings, consider obtaining clotting studies and**
- abdominal radiograph.
- **4. If metabolic acidosis occurs, hold feedings, evaluate closely for NEC, sepsis,**
- hypotension and a patent ductus arteriosus. Metabolic acidosis in the presence of NEC
- is a grave prognostic sign.
- **5. Loose stools, temperature instability, apnea, hyperglycemia: Hold feedings and**
- evaluate infant carefully.

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