Appropriate Follow-Up Care
Mothers were encouraged to continue breastfeed as primary nutritional source for their infants for at least 6 months.
Infant with an appropriate weight for postconceptional age at discharge should be breast-fed when possible.

ESPGHAN committee on nutrition (May 2006)
Feeding preterm infant after hospital discharge

- Infant discharge with a subnormal weight for postconceptional age are at increased risk of long-term growth failure
  - Breast-fed infant: supplement with HMF
  - Formula-fed infant: should receive special post-discharge formula

ESPGHAN committee on nutrition (May 2006)
Growth and Nutrition
Feeding

- Feed every 1.5-3 h, no more than one period of prolonged sleep of up to 5 h
- Ad-libitum feeding is encouraged to optimize infant growth
- Mother should be advised to express after feeds

Deborah L. O’Connor, Semin Fetal Neonatal Med 2013
Postdischarge Assessment

- 1 week
- 1 month
Nutrition monitoring 1 week after discharge

1. Assess intake
   ▫ History
   ▫ Observation of feeding
   ▫ Consider test weighing

2. Growth-weight and length

3. Biochemical indices (optional)

Assessment

Optimal

Suboptimal
### Sign of effective breastfeeding

<table>
<thead>
<tr>
<th>Baby</th>
<th>Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>° Mouth is moist and pink</td>
<td>° Breast feel softer and less full after breastfeeding</td>
</tr>
<tr>
<td>° Alert &amp; move eye actively</td>
<td>° Experience letdown reflex</td>
</tr>
<tr>
<td>° Vigorous cry</td>
<td>° Nipple is elongated after breastfeeding</td>
</tr>
<tr>
<td>° Good skin turgor</td>
<td></td>
</tr>
<tr>
<td>° Fontanels are flat and soft</td>
<td></td>
</tr>
<tr>
<td>° No fever</td>
<td></td>
</tr>
<tr>
<td>° Looking relaxed and sleepy</td>
<td></td>
</tr>
<tr>
<td>° Adequate output</td>
<td></td>
</tr>
</tbody>
</table>
Test weighing remains the most accurate and reliable than clinical indicator for preterm infant.

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight (g/day)</th>
<th>Length (cm/week)</th>
<th>Head Circumference (cm/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 months</td>
<td>25-30</td>
<td>0.7-1</td>
<td>0.5</td>
</tr>
<tr>
<td>3-12 months</td>
<td>10-15</td>
<td>0.4-0.6</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Hall, Robert T.  *Pediatric Clinics* 2001
Assessing growth and body composition

- **INTERGROWTH-21st**
  - Postnatal Growth of Preterm Infants Charts: up to 64 wk
- **Fenton chart**: up to 50 wk
- **WHO growth chart**: postnatal growth from 50 wk (PMA) to 24 months
Biochemical indices

- Osteopenia of prematurity
  - ↓ Ca and P and ↑ ALP
  - ↑↑ ALP related to bone fractures and stunting of growth

- Anemia
  - hemoglobin (10.5-13.5 g/dL) and/or hematocrit (33-39%)

- Protein intake
  - BUN
## Biochemical and Growth Monitoring for Premature Infants in the Postdischarge Period

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Action values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Growth</strong></td>
<td></td>
</tr>
<tr>
<td>Weight gain</td>
<td>&lt;15 g/day</td>
</tr>
<tr>
<td>Length increase</td>
<td>&lt;0.5 cm/wk</td>
</tr>
<tr>
<td>Head circumference increase</td>
<td>&lt;0.5 cm/wk or &gt; 1 cm/wk</td>
</tr>
<tr>
<td><strong>Biochemical markers</strong></td>
<td></td>
</tr>
<tr>
<td>Phosphorus</td>
<td>&lt;5 mg/dL</td>
</tr>
<tr>
<td>Alkaline phosphatase</td>
<td>&gt; 500 IU/L</td>
</tr>
<tr>
<td>Blood urea nitrogen</td>
<td>&lt; 8 mg/dL</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>&lt;11 g/dl</td>
</tr>
</tbody>
</table>

Nutrition monitoring 1 week after discharge

1. Assess intake
2. Growth-weight and length
3. Biochemical indices

Optimal

Assessment

Suboptimal

Reevaluated at 1 month after discharge

Assess adequacy of feeding
Triple feeding

BREASTFEED

Put the baby to breast

SUPPLEMENT

With expressed breastmilk/formula
Use a bottle syringe/fingerfeed tube at breast

PUMP

until empty to maintain milk supply
Nutrition monitoring 1 month after discharge

1. Assess intake
2. Growth-weight and length
3. Biochemical indices

Optimal

Reevaluated at every 1-2 months to 1 year corrected age

Assessment

Suboptimal
Tree options for fortification of human milk

<table>
<thead>
<tr>
<th>Option</th>
<th>Fortification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Some formula feed</td>
<td>• HM + post-discharge formula (22kcal/Oz) x3/d</td>
</tr>
<tr>
<td></td>
<td>• HM + 30 Kcal formula x1/d</td>
</tr>
<tr>
<td>2. Enriching feeds</td>
<td>• Add post-discharge formula to expressed HM</td>
</tr>
<tr>
<td>3. Nursing supplemener</td>
<td>• Supplement with 15 ml of post-discharge formula (22kcal/Oz) in all feeding</td>
</tr>
</tbody>
</table>

Vitamin and mineral supplementation

AAP CPS WHO recommend

- Vitamin D supplement of 400 IU (10 mg) daily from birth to 1 year of life for breastfed infant
- Discontinued if infant consumes a minimum of one liter of formula daily
Iron supplement

AAP (2009)
- 2 mg/kg/day at 1 month and continuing for 12 months.

CPS (1995)
- 3-4 mg/kg/day for those born at <1000 g and
- 2-3 mg/kg/day for those born >1000 g at 6-8 weeks and continuing until 12 months of corrected age.

ESPGHAN (2006)
- 2-3 mg/kg/day at 2-6 weeks and continuing until 6-12 months
Neurodevelopment
Human brain development

Neurodevelopmental outcomes of preterm infants fed human milk: a systematic review

- There is evidence to support beneficial effects of HM on brain, visual, and cognitive development from infancy to adolescence.
- Volume of breast milk consumed is an important predictor of cognitive outcomes.

Beatrice E. Lechner, J perinatology 2017
Cognition and Learning

- Meta-analysis suggests that breastfeeding is associated with increased performance in intelligence tests in childhood and adolescence, of 3.5 points on average.
Developmental Assessment For Intervention Manual (DAIM)
WHO : Baby-Friendly Hospital Initiative 2009

- Hospital have a system of follow-up support for mothers after discharged such as
  - Early postnatal follow-up
  - Lactation clinic follow-up
  - Home visit (nurse, lactation consultant)
  - Telephone call
  - Community/social service support
  - Mother support group
The revised BFHI 2018

80%

Mothers can access breastfeeding support in their community
Success of breastfeeding

- Parental education and support
  - Antenatal education and postnatal support
  - Father who are engaged and educated in breastfeeding process is associated with increase rate of breastfeeding

## Knowledge management

<table>
<thead>
<tr>
<th>Problems</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>◦ Loss follow up/contact</td>
<td>◦ knowledge</td>
</tr>
<tr>
<td>◦ Hospital service</td>
<td>◦ Relationship</td>
</tr>
<tr>
<td>▪ System</td>
<td>◦ Follow up system</td>
</tr>
<tr>
<td>▪ Place</td>
<td>◦ Hospital record/transfer system</td>
</tr>
<tr>
<td>▪ Team</td>
<td>◦ Set place and team</td>
</tr>
<tr>
<td></td>
<td>◦ Home visit</td>
</tr>
<tr>
<td></td>
<td>◦ Analyze data</td>
</tr>
</tbody>
</table>
Happy breastfeeding