



Criteria

- Weight for age <5th percentile on WHO Growth Chart (0-24 months). (Note: The growth chart in RAVEN defaults to the CDC. Select the WHO growth chart by clicking on "CDCWHO.")
- Weight for length <5th percentile on WHO Growth Chart (0-24 months).
- Decrease across two major percentile lines over a 3-6 month period.

High-Risk Criteria (Consider admission.)

- <1 month: not regaining birth weight by 21 days of life, continued weight loss after 7 days of life.
- 1 month-12 months: no weight gain, weight loss, weight for length z-score of -2 or lower. (Note: to see z-score in RAVEN, select the weight for length growth chart and click "table.")
- Medical instability
- Moderate to severe malnutrition with concern for refeeding syndrome
- Moderate to severe dehydration
- Failed outpatient managements including multiple missed appointments
- Suspected abuse/neglect

Frequency of Weight Checks

- <1 month: Q1-3 days
- 1-6 months: Q1-2 weeks
- 6-12 months: Q2-4 weeks
- 12-24 months: Q2-4 weeks

Differential Diagnosis: General Categories and Symptoms

Inadequate Intake

- Long intervals between feeds (Sleep >3 hours if <2 months old)
- Falling asleep during feeds
- Limited number and volume of feeding per day
- Improper mixing of formula
- Lactation problems: poor supply, difficulty with latching
- Limited urine diapers (<1 wet diaper per 8 hours)
- Food insecurity/inability
- Excessive vomiting/spitting up/reflux
- Increased hunger cues/caregiver isn't recognizing cues
- Symptoms of maternal depression
- Birth weight not regained in 2 weeks
- Oral Motor Dysfunction

Malabsorption

- High volume, extremely loose stools
- Clay-colored stools
- Greasy or significantly foul-smelling stools
- Chronic diarrhea
- Abdominal distention, gassiness with diarrhea
- Blood in stools

Increased Metabolic Demand

- Cardiac: heart murmur, tachypnea, sweating or cyanosis with feeds, feeding fatigue
- Respiratory: noisy breathing, tachypnea, difficulty breathing with feeds, nasal obstruction
- Neurologic: increased or decreased tone, abnormal movements
- Metabolic/genetic: abnormal newborn screen, dysmorphic features
- Renal: urologic abnormalities, renal tubular acidosis
- Endocrinology: tachycardia, diaphoresis

Patient at risk for malnutrition or failure to thrive (FTT)

Initial Evaluation

- Full history (see box on [next page](#)). Use autotext "...hpiFTT."
- Full physical exam (see box on [next page](#)). Use autotext "...physFTT."

Please have a low threshold to consult a pediatrician for any child you are concerned about.

Does patient have any High-Risk Criteria? (See box.)

Yes

No

- Consider differential diagnosis.
- Perform lab work-up (see box).
- Consider admission.

- Give feeding recommendations per box on [next page](#).
- Schedule weight checks at frequency in box.
- Consider fortification of feeds.

- Daily naked weights.
- Strict I/O, calorie counts.
- If breastfeeding, do weights pre- and post-feeds. (Naked except for diaper that should not be changed until after weight.)
- Implement initial feeding recommendations per box on [next page](#).

At weight check, is patient gaining adequate weight?

Yes

Continue scheduled weight checks until adequate weight gain at three consecutive visits.

Is patient gaining adequate weight after 2-3 days?

No

Yes

- Implement secondary feeding recommendations on [next page](#).
- Consider transfer to higher level of care if patient does not gain weight after these measures.

- Discharge with:
- Detailed feeding plan that includes timing, volume, calorie density, supplements, etc.
 - Scheduled follow-up per box. If returning to village, consider a weight check in 24-48 hours in outpatient clinic before returning to village.

Lab Workup, By Age

Use Power Plans "PED Pediatric Failure to Thrive" and "AMB Peds Failure to Thrive" to place orders in RAVEN.

- <1 month:
 - Verify Newborn Screen, CMP, CBC, urinalysis.
 - Consider metabolic evaluation.
- 1-24 months:
 - CBC, CMP, urinalysis, TSH, HIV, PPD (if <6 months but only actionable if positive) or Quantiferon (if >6 months), celiac screen if >6 months and gluten exposure (total IgA tissue transglutaminase, IgG deaminated gliadin peptide).
 - Consider sending stool for occult blood, metabolic evaluation.

This guideline is designed for the general use of most patients but may need to be adapted to meet the special needs of a specific patient as determined by the medical practitioner.

Approved by MSEC 3/1/22.

Click [here](#) for supplemental resources for this guideline.

If comments about this guideline, please contact
Jennifer_Prince3@ykhc.org.



History

Use autotext “.hpiFTT” to document in RAVEN.

General

- Recurrent fevers or infections
- Detailed birth history

Cardiovascular

- Sweating and/or fatigue with feeds

GI

- Constipation
- Vomiting

Neurologic

- Depressed mental status, inconsolability, sleepiness
- Developmental delay
- Abnormal movements

Feeding

- Breastfeeding
 - Frequency, length, number per day, longest interval between feedings, night vs day?
 - One or both breasts, softer after feeding, ± nipple shield, any pain or difficulty with latch?
 - If pumping, how much is produced?
 - Can you see or hear the baby swallow?
 - Any supplementation (expressed breast milk or formula)?
 - Does baby fall asleep at breast?
- Formula
 - Frequency, length, amount per feed and per day, longest interval between feeds, night vs day?
 - Type of formula and recipe
 - Type and size of bottle and nipple
 - Any supplementation (either addition to the bottle or solids)?
- Swallow problems
 - Coughing during feeding
 - Wet or gurgly sounds during or immediately after feeding
 - Frequent upper respiratory tract infections, fevers, or pneumonia
- Reflux
 - Coughing, choking, gagging, or any respiratory symptoms with feeds
 - Spitting up/vomiting
 - Arching, fussiness, or discomfort with feeds

Social

- Who feeds the baby? Who lives at home? Is there a feeding schedule?
- If bottle fed, are there concerns about obtaining enough formula?

Elimination

- Number of wet and stool diapers per 24 hours
- Stool appearance (consistency, color, any orange/red crystal/powder, any blood or mucus)

Please see [ANMC's Preterm Nutrition Resource](#) for more information, including recipes for mixing high caloric density formula.

Initial Feeding Recommendations

Breastmilk/Formula

- Minimum Intake Recommendations:
 - Term Infant: 108 kcal/kg/day = 162 mL/kg/day of 20 kcal/oz formula/breast milk
 - Preterm Infant: 110-130 kcal/kg/day = 177 mL/kg/day of 22 kcal/oz preterm formula
- Feeding Frequency:
 - <3 months: Q3h or ≥8 feeds/day. No more than 3 hours between feeds.
 - ≥3 months: Q3h during day with ≥6 feeds/day
- Wake the baby to feed if necessary.

For Solids

- Infant must be taking at least 24 oz/day of formula or breastmilk.
- Limit any other fluids like water or juice.
- By 12 months, goal 4-6 servings of >4 tablespoons per day.

Secondary Feeding Recommendations

- If patient is able to tolerate goal feed volume, increase volume by 10% to max 180 mL/kg/day OR increase caloric density by 2 kcal/ounce to max 24 kcal/ounce.
- Allow at least 24 hours to assess tolerance to any changes.
- If patient is taking solids and >9 months, consider increasing calories in solids.
- If patient is not able to consistently and safely take enough by mouth to gain weight, consider NG feeds.

Physical

Use autotext “.physFTT” to document in RAVEN.

General

- Cachexia, decreased subcutaneous stores, decreased muscle bulk
- Relative macrocephaly
- Lack of caregiver bonding or responsiveness to patient
- Dysmorphic features or syndromic appearance

HEENT

- Scleral icterus
- Nasal congestion or obstruction
- Cleft lip or palate
- Macroglossia or ankyloglossia
- Micrognathia

Respiratory

- Stridor
- Difficulty breathing, tachypnea
- Abnormal breath sounds including wheezing, crackles, etc.

Cardiovascular

- Murmurs
- Diminished or absent peripheral pulses

GI

- Hepatosplenomegaly
- Abdominal distension
- Palpable stools

Skin

- Jaundice
- Rashes or skin breakdown (including in diaper area)
- Severe atopic dermatitis

Neurologic

- Depressed mental status, inconsolability, sleepiness
- Developmental delay
- Abnormal movements

Caloric Needs by Age

If preterm, use corrected age.

- <37 weeks: 110 -130 kcal/kg/day
- 37 weeks-6 months: 108 kcal/kg/day
- 7-12 months: 98 kcal/kg/day
- 12-24 months: 75-95 kcal/kg/day

Average Daily Weight Gain by Age

| Age (corrected) | Median (grams/day) | |
|------------------|--------------------|--------|
| | Girls | Boys |
| 2-4 weeks | 29 | 34 |
| 4 weeks-2 months | 34 | 40 |
| 2-3 months | 24 | 27 |
| 3-4 months | 20 | 21 |
| 4-5 months | 16 | 17 |
| 5-6 months | 13 | 14 |
| 6-8 months | 11 | 11 |
| 8-10 months | 9 | 9 |
| 10-12 months | 8 | 8 |
| 12-15 months | 4-9.5 | 4.5-10 |
| 15-18 months | 4-9.5 | 4-9 |
| 18-21 months | 4-9.5 | 4-9 |
| 21-24 months | 3.5-9 | 3.5-9 |

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