

Failure to Thrive

Children's National Medical Center Case Study

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Children's National™

Objectives

- Patient Overview
- Patient Assessment - Day 1
- Failure to Thrive
- Patient Follow Up - Day 3
- Post Rotation Follow Up

Patient Overview

8 month, 2 week old female

Full term at delivery

Reason for consult: poor weight gain

Per Mom: patient not eating well + emesis/reflux

Diet: Alimentum (26 kcal/oz)

Patient Assessment - Day 1

Anthropometrics

Weight: 7.2 kg

Height: 74 cm

Weight-for-length: <2nd %tile

Weight-for-age: 10-25th %tile

Length-for-age: 90-95th %tile

Estimated Needs:

100 kcal/kg/day

1.5 g protein/kg/day

720 mL/day

Goal for growth:

10-16 gm/day

Patient Assessment - Day 1

Recommendations:

- Alimentum (20 kcal/oz), goal 1080 mL/day
- Follow SLP recommendations for solid food intake
- Weigh daily, use same scale
- If unable to consume 1080 mL/day, place NG tube & provide fortified feeds

Goal for Meals/Snacks: Provide 100% estimated needs within 24-48 hours

Follow up: 2 days, while continuing to follow the team

Patient Assessment - Day 1

Nutrition Weight Diagnosis:

Underweight NC-3.1

Related to inadequate intake vs
malabsorption vs increased needs

As evidenced by patient charts <2nd %tile on
weight-for-length

Patient Assessment - Day 1

Underweight NC-3.1 & Failure To Thrive

IDNT indicators: Infants 0-24 months of age

- Refusal to eat
- Weight-for-age or weight-for-length $<5^{\text{th}}$ %tile
- Estimated food intake less than estimated nutrition needs

Failure to Thrive

Definition

A term regarding a state of undernutrition

- Inadequate caloric intake or absorption
- Excessive caloric expense

“Inadequate growth or the inability to maintain growth, usually in early childhood”

(Cole & Lanham, 2011)

Failure to Thrive: An Update

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JASON S. LANHAM, MAJ, MC, USA, Eisenhower Army Medical Center, Ft. Gordon, Georgia

Failure to thrive in childhood is a state of undernutrition due to inadequate caloric intake, inadequate caloric absorption, or excessive caloric expenditure. In the United States, it is seen in 5 to 10 percent of children in primary care settings. Although failure to thrive is often defined as a weight for age that falls below the 5th percentile on multiple occasions or weight deceleration that crosses two major percentile lines on a growth chart, use of any single indicator has a low positive predictive value. Most cases of failure to thrive involve inadequate caloric intake caused by behavioral or psychosocial issues. The most important part of the outpatient evaluation is obtaining an accurate account of a child's eating habits and caloric intake. Positive laboratory testing rarely identifies a cause and is not generally recommended. Reasons to hospitalize a child for further evaluation include failure of outpatient management, suspicion of abuse or neglect, or severe psychosocial impairment of the caregiver. A multidisciplinary approach to treatment, including home nursing visits and nutritional counseling, has been shown to improve weight gain, parent-child relationships, and cognitive development. The long-term effects of failure to thrive on cognitive development and future academic performance are unclear. (*J Am Fam Physician*. 2011;83(7):829-834. Copyright © 2011 American Academy of Family Physicians.)

▶ **Editorial note:** A link to the full-text version of this article is provided on page 831.

Failure to thrive (FTT) is a term used to describe inadequate growth or the inability to maintain growth, usually in early childhood. It is a sign of undernutrition, and because many biologic, psychosocial, and environmental processes can lead to undernutrition, FTT should never be a diagnosis unto itself. A careful history and physical examination can identify most causes of FTT, thereby avoiding protracted or costly evaluations.¹

Definition

Table 1 lists commonly used anthropometric criteria for diagnosing FTT. Most of these criteria involve plotting a child's growth on a standardized growth chart over multiple visits.

In 2006, the World Health Organization released updated growth charts that incorporate data from six countries and set a new benchmark for the biologic norm. These charts are available at <http://www.who.int/childgrowth>. In comparison, the 2000 Centers for Disease Control and Prevention charts include formula-fed infants and reflect norms for heavier children (<http://www.cdc.gov/growthcharts/>). Therefore, the growth of healthy breastfed infants may

appear to fall on the Centers for Disease Control and Prevention charts after two months of age.²

There is no consensus on which specific anthropometric criteria should be used to define FTT.³ In routine clinical practice, FTT is commonly defined as either a weight for age that falls below the 5th percentile on multiple occasions or a weight deceleration that crosses two major percentile lines on a growth chart.⁴ Although this is a simple way to assess for FTT in the office setting, the use of any single indicator has been shown to have a low positive predictive value for true undernutrition. In one study, 57 percent of infants met at least one definition for FTT during the first year of life.⁵

A combination of anthropometric criteria, rather than one criterion, should be used to more accurately identify children at risk of FTT.^{6,7} Weight for length is a better indicator of acute undernutrition and is helpful in identifying children who need prompt nutritional treatment.⁸ Weight that is less than 75 percent of the 50th percentile on the weight-for-length curve is an indicator of severe malnutrition and may require inpatient treatment.⁹

Newer growth indices from the World Health Organization use weight z-scores

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Failure to Thrive

Definition

Using a combination of anthropometric data more accurately identifies children at risk.

However, no consensus on which data to use:

- BMI for age, length for age, weight for age, or weight velocity <5th %tile
- Weight decreasing across 2 major %tile lines
- Weight <75% median weight for age or weight for length

Failure to Thrive

Acute Failure to Thrive

Weight for length is a better indicator.

Weight for length <70% of the 50th %tile

- Severe malnutrition
- Potential inpatient treatment

Prevalence? Varies with the definition being used and population demographics.

Failure to Thrive

Etiology

- Multifactorial: biologic, psychosocial, environmental.
 - 80% of cases are absent underlying medical causes
- Calories-
 - Inadequate intake- psychosocial, environmental.
 - Inadequate absorption- excessive emesis or malabsorption.
 - Excessive expenditure- chronic conditions.

~~Organic &
Inorganic~~

(Cole & Lanham, 2011)

Failure to Thrive

Determination of Etiology/FTT Diagnosis

- Accurate anthropometric measurements
- Detailed eating habits, caloric intake, parent-child interactions
- Health screen for mental illness
 - Patient and caregiver
- Lab tests

Failure to Thrive

Treatment

- Multi-disciplinary approach: cognitive development, parent-child relationships
- Age appropriate nutrition counseling

Nutrition Prescriptions: catch up growth

- Concentrated formulas, energy dense meals
- Enteral feed (NG)

Assessment Goals

Goal: Provide 100% estimated needs within 24-48 hours

Estimated Needs

100 kcal/kg/day

1.5 g protein/kg/day

720 mL/day

Follow up:

2 days (as we would continue to follow the team)

Patient Follow Up - Day 3

Intake*

Day 1: 62 kcal/kg
1.3 g protein/kg
555 mL

Day 2: 53 kcal/kg
1.0 g protein/kg
490 mL

170 g weight gain from admission.

| Feeding time | Day 1 (mL) | Day 2 (mL) |
|--------------|------------------------|------------|
| 0700 | 90* | NPO |
| 1000 | 30* | NPO |
| 1200 | 15 mL H ₂ O | 150* |
| ~1500 | 135* | 120* |
| ~1800 | 60* | refused |
| 2100 | 120 | refused |
| 0000 | - | 60 |
| 0300 | 120 | 120* |
| 0600 | NPO | 40 |

* 1 tablespoon rice cereal provided with bottle

*All approximate values.

Patient Follow Up - Day 3

Recommendations:

Continue to weigh daily, follow SLP consults.

Diet order: Similac Advanced (24 kcal/oz)

- 90 mL 5x/day. Allow 20 minute PO intake, gavage remaining formula.
- Overnight: 450 mL/hr, start 20 mL/hr increase 10 mL q 4 hrs to goal 45 mL/hr

After My Rotation Concluded

Day 3: Return to Alimentum

Day 4: Diet order: 112 mL Alimentum (24 kcal/oz)

QID + 450 mL Alimentum (24 kcal/oz) @ 45 mL/hr
x10 hours. *Providing 103 kcal/kg, 900 mL.*

Day 6: Intake: 900 mL Alimentum (24 kcal/oz)

103 kcal/kg!

Day 7: 240 g weight gain

References

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Questions?

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experience at Children's!

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