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## What is the clinical workup for failure to thrive?

### Evidence-based answer

The clinical evaluation of failure to thrive (FTT) includes a thorough history and physical examination; observation of parent-child interactions; observation and documentation of the child's feeding patterns; and a home visit by an appropriately trained

health care professional (Strength of Recommendation [SOR]: **C**). Further diagnostic testing should be performed as indicated by positive findings from the history and physical exam or if the child's weight has not improved at follow-up (SOR: **C**).

### Clinical commentary

#### A complex problem that requires a team approach

We admit several infants with FTT to the hospital each month from a large population of young families at Fort Bragg, NC, and manage many more in our outpatient practice. Our experience confirms that FTT is a complex problem with many potential causes.

Laboratory and other evaluation beyond history, physical examination, and observation rarely help establish the diagnosis or prognosis. Incidental abnormalities occasionally change management, but more often result in false positives.

Close follow-up and a multidisciplinary team approach generally uncover the cause and lead to successful treatment. Children

who don't respond to treatment or have a suspected "organic" cause of FTT always warrant further laboratory investigation to identify the 1% of cases that result from a diagnosable disease. FTT can also be the sole indication of neglect or nonaccidental trauma, with devastating consequences.

Early identification of an infant or child approaching the diagnostic criteria for FTT is critical. Diagnosis and intervention may be delayed by inaccurate growth curve points, loss of a growth chart in a busy practice, or lack of well-child visits. Our experience with early detection and a multidisciplinary team treatment approach has been highly successful.

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### FAST TRACK

**As many as 10% of children seen in primary care show signs of failure to thrive**

### Evidence summary

FTT is a generic term used to describe a child whose current weight (or trajectory of weight gain) does not equal that of other children of similar age, gender, and ethnicity. No single accepted anthropo-

metric measure can be used to diagnose the condition.<sup>1</sup>

FTT has been variously defined in children who:

- drop more than 2 standard percentile lines on standardized

growth charts,<sup>2</sup>

- are below the third percentile for weight,
- have weight-for-length <80% of ideal weight,<sup>3</sup>
- have height-for-weight less than the third percentile,<sup>4</sup>
- have weight-for-height less than the 10th percentile, or have weight-for-age less than 2 standard deviations below the mean for age.

Recent updates of standardized growth charts for children are available from the Centers for Disease Control and Prevention at [www.cdc.gov/nchs/about/major/nhanes/growthcharts/clinical\\_charts.htm](http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/clinical_charts.htm).

### A complex diagnosis

FTT occurs when nutritive intake is insufficient to meet demands for growth (**TABLE**). It is usually manifested by failure to gain weight. In more severe cases, height and head circumference are affected. FTT is also associated with lower developmental testing scores,<sup>5</sup> persistent poor growth, increased susceptibility to infections, and an increased prevalence of behavioral disorders and neurologic disability.<sup>4</sup> As many as 10% of children seen in primary-care settings show signs of FTT.<sup>2</sup>

Children with FTT are most often identified when parents raise concerns about the child's feeding or growth patterns or when a physician notes a decrease in the child's growth on physical examination. The terms "organic" and "inorganic" or "nonorganic" FTT, often used to guide diagnostic thinking, are outdated because most cases of FTT are influenced by many variables.<sup>6</sup> FTT represents the final common pathway of disruptions in the complex system of biological, psychosocial, and environmental factors contributing to a child's growth and development.

### FTT has 3 basic causes

**1. Inadequate caloric intake.** More than 80% of children with poor growth do

not have an underlying medical disorder.<sup>7</sup> The initial workup, therefore, should include a thorough dietary and psychosocial history. Find out exactly what the child eats, how often he eats, and what behaviors he exhibits at meal-times.

A detailed prenatal history (including birth weight and pregnancy complications) and medical history for both the child and parents can identify underlying metabolic, endocrine, or familial disorders. It is always important to look for signs of child abuse, because children with FTT are more likely to be victims of abuse than normal-weight peers.<sup>3</sup> That said, other factors are responsible for poor nutritional intake in as many as 80% of cases.<sup>8</sup>

**2. Inadequate caloric absorption (malabsorption).** This usually results from persistent emesis or malabsorption. Emesis can be caused by reflux, obstruction, medication, food sensitivities, or underlying metabolic disease. Malabsorption most often arises from chronic diarrhea, celiac disease, protein-losing enteropathy, food sensitivities, or excessive juice intake.

**3. Excessive caloric expenditure.** Such expenditure is associated with underlying medical conditions such as congenital heart disease, chronic hypoxia (pulmonary disease), hyperthyroidism, metabolic disease (diabetes, renal tubular acidosis), chronic immunodeficiency, recurrent infection, or malignancy.

FTT accounts for between 1% and 5% of all pediatric hospitalizations.<sup>9</sup> Children who continue to exhibit poor growth despite adequate outpatient evaluation should be admitted to the hospital. Admission is also indicated if abuse is suspected.

### Recommendations

The American Academy of Pediatrics recommends that physicians consider child neglect as a cause of FTT, particularly in cases that do not resolve with appropriate medical intervention.<sup>3</sup>

The American Gastroenterological Association<sup>10</sup> and World Gastroenterol-

### FAST TRACK

**More than 80% of children with poor growth do not have an underlying medical disorder**

TABLE

**Failure to thrive: Causes and physical findings**

GENERIC CAUSE	ASSOCIATED CONDITIONS	PHYSICAL FINDINGS*	DIAGNOSTIC EVALUATION
<b>Inadequate caloric intake</b>	<p><b>Poor food intake</b> Chronic illness Inappropriate type/volume of feeding</p> <p><b>Food not available</b> Parental withholding Neglect Poverty</p>	<p>Signs of neglect or abuse</p> <p>Minimal subcutaneous fat</p> <p>Protuberant abdomen</p>	<p>Complete dietary history and psychosocial evaluation</p> <p>Complete blood count (CBC)</p> <p>Basic metabolic profile</p> <p>Lead screening</p>
<b>Inadequate caloric absorption</b>	<p><b>Gastrointestinal causes</b> Malabsorption Chronic vomiting Pancreatic insufficiency Celiac disease Chronic reflux Inflammatory bowel disease Chronic renal disease</p> <p><b>Cystic fibrosis</b></p>	<p>Dysmorphism suggestive of chronic disease</p> <p>Organomegaly</p> <p>Skin/mucosal changes</p>	<p>Stool pathogens</p> <p>Stool fat</p> <p>Cystic fibrosis screening</p> <p>CBC/erythrocyte sedimentation rate (ESR)</p> <p>Basic metabolic profile</p> <p>Urinalysis (U/A)</p>
<b>Excessive caloric expenditure</b>	<p><b>Hyperthyroidism</b></p> <p><b>Chronic disease</b> (cardiac, renal, endocrine, hepatic)</p> <p><b>Malignancy</b></p>	<p>Dysmorphism</p> <p>Skin dysmorphism</p> <p>Cardiac findings</p>	<p>TSH</p> <p>CBC/ESR</p> <p>Basic metabolic profile</p> <p>Liver function tests</p>

\*Abnormal weight is observed in all cases.

Modified from Skuse DH et al.,<sup>8</sup> Bergman P et al.,<sup>13</sup> Krugman SD et al.<sup>14</sup>

**FAST TRACK**

**Consider child neglect when medical intervention doesn't resolve the failure to thrive**

ogy Organization<sup>11</sup> recommend that physicians consider celiac sprue in children presenting with FTT. Interestingly, the *Cochrane Database of Systematic Reviews* suggests that there is little systematic evidence to support routine growth monitoring in children.<sup>12</sup> ■

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