

Approach to the Underweight Child

1. General Presentation

Children normally follow a predictable course of weight gain as they grow. Deviations from this course, specifically a significant weight loss or a change from the previous pattern of weight gain, can indicate a problem. Weight gain that tracks well below the 5th percentile on growth curves or that is proportional to, but lower than, the child's growth in height can also be of concern. Children under the age of 2 years who are underweight are discussed elsewhere (See "Failure to Thrive"), as is short stature in children (See "Approach to the Short Child").

Proper tracking of height and weight changes in children is crucial to identifying potential problems. Ideally, a child's height and weight should be tracked several times over a 6 to 12 month period in order to identify trends or changes that may indicate poor weight gain. When a pattern of weight gain that is cause for concern is identified, a proper history and physical can help determine the cause.

2. Differential Diagnosis

An underlying medical condition is often responsible for involuntary weight loss, while psychosocial and environmental factors tend to be the cause of slow weight gain. The causes of problems with weight gain generally fall into the following categories:

A. Eating too little food, due to:

- Behavioural issues (e.g. picky eaters, parent/child control issues, food aversions, attention problems, hyperactivity, eating disorders such as anorexia nervosa)
- Decreased appetite (e.g. drinking too much non-nutritious liquid such as juice, chronic diseases)
- Dietary restriction (e.g. vegetarianism, dairy-free diet, some diets based on various cultural beliefs)
- Medications (e.g. those for seizures or attention deficit disorder)
- Oromotor dysfunction (e.g. central nervous system disorders, neuromuscular disorders)
- Pain or discomfort when eating (e.g. gastroesophageal reflux, dental caries)
- Poverty
- Psychosocial stress

B. Increased metabolic requirements due to:

- Chronic lung disease
- Congenital heart disease
- Hyperthyroidism
- Inflammation (e.g. cystic fibrosis, inflammatory bowel disease, malignancy)
- Obstructive sleep apnea

C. Increased losses of nutrients through stool, urine or vomit, due to:

- Bulimia nervosa
- Celiac disease
- Chronic liver disease
- Cystic fibrosis
- Infection (e.g. giardiasis)
- Inflammatory bowel disease
- Inborn errors of metabolism
- Pancreatitis
- Protein sensitivity (i.e. allergies)
- Renal tubular acidosis
- Short gut syndrome
- Type 1 diabetes

2. Questions to Ask

The history for a child with poor weight gain should focus on the child's diet and eating behaviours, perinatal history, growth and development, social history (including screening for poverty and neglect or child abuse), family history, and a review of symptoms to determine if there are any related problems.

Questions may include:

- What is the child's diet like? A 3 day diet record of all the food and drinks the child consumes can be very helpful and often more accurate than parental recall of the child's diet.
- What vitamin and mineral supplements are used?
- What is the child's appetite like?
- What is the child's behaviour like at meal times?
- How do the parents respond to the child's eating behaviours?
- How was the child fed during the first year?
- Were there any medical problems or complications during the pregnancy, birth, or first year of life?
- Does the child have any trouble with chewing and swallowing?
- Does the child have diarrhea, constipation or vomiting?
- Were there any factors associated with the change in weight (e.g. school stress, a divorce, a change in diet etc.)?
- Did the weight loss happen suddenly or slowly over time?
- In the past month, was there any day when you or anyone in your family went hungry because you did not have enough money for food?
- Within the past 12 months, did you worry whether your food would run out before you got money to buy more?

3. Procedure for Investigation

Physical Exam

Often the physical exam of a child with weight gain problems will not yield any specific findings other than muscle wasting and/or decreased fat. However, a complete physical should still be done to look for signs of:

- anatomic abnormalities
- abuse
- developmental problems
- neurologic problems
- underlying medical conditions (e.g. abnormal breath sounds, a heart murmur, hepatomegaly, abdominal distension)

The child's height and weight should also be taken and plotted on a growth chart to track any changes over time, including during and after any therapeutic interventions to evaluate their efficacy.

Other Lab Investigations

Depending on what the history and physical exam reveal and the most likely cause of weight loss in the patient, additional lab tests and imaging studies may include:

- Kidney, liver & pancreatic function tests (electrolytes, BUN, creatinine, glucose, calcium, phosphorous, magnesium, albumin, total protein, liver enzymes, amylase, lipase)
- Stool tests for infection (e.g. H. pylori, giardia) or other tests for infectious agents (e.g. HIV, tuberculosis, hepatitis panel)
- Thyroid studies
- Chest radiograph
- Upper GI imaging series, small bowel follow-through, swallowing function studies, or endoscopic studies with biopsies
- Testing for inborn errors of metabolism, storage disease, or chromosomal abnormalities
- Endocrine evaluations, especially for growth hormone

References

Duryea, Teresa K. & Motil, Kathleen J. Poor weight gain in children older than two years of age (August 2010) www.uptodate.com Accessed March 2, 2011

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Acknowledgements

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