

How to Evaluate Weight Loss

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Significant weight loss is defined as a loss of greater than 5% of initial body weight.¹ It is a systemic manifestation of an underlying disorder and not a disease entity by itself. Weight loss has been associated with undesirable outcomes such as infections, poor wound healing, and death. It is important to differentiate between voluntary and involuntary weight loss at the outset, so as to avoid unnecessary and costly evaluation. Involuntary weight loss is associated with higher than expected mortality^{2,3} and is the subject of this chapter. It has a vast differential diagnosis and it is important to pay as much attention to history and physical examination as to the ancillary tests. Despite a thorough search, sometimes it is not possible to find a cause for weight loss, but it should be re-evaluated from time to time.

Differential Diagnosis

Decreased Intake: About one third of these patients have cancer, and one fourth are unexplained cases.² Other potential causes are:

- HIV and AIDS: The infection can cause a wasting disease due to low intake, gastrointestinal disturbances and secondary infections^{4,5}.
- Depression: Weight gain can occur too.
- Dementia
- Poor oro-dental hygiene: Poor intake results from problems with chewing, pain, and dysgeusia.
- Dysphagia and odynophagia
- Hypercalcemia may cause anorexia and nausea.
- Adrenal insufficiency may be associated with anorexia, nausea and hypovolemia.
- Thyrotoxicosis: Elderly patients can have anorexia⁶
- Alcoholism: Neglect of calorie intake, and other nutritional deficiencies leads to weight loss.
- Uremia: Anorexia and proteinuria may both affect weight.
- Malignancy: Anorexia, increased energy expenditure⁷, and malabsorption resulting from tumor invasion of gastrointestinal tract may exist.
- Congestive heart failure is sometimes associated with congestive enteropathy.

- COPD: Weight loss is thought to be mediated through markers of systemic inflammation, i.e., tumor necrosis factor- alpha.⁸
- Chronic inflammatory disease: Causes of weight loss include anorexia and increased energy expenditure due to fever.
- Anorexia nervosa
- Starvation associated with famine or lack of food due to poverty.
- Drugs: Digitalis, quinidine, amphetamines, NSAIDs, metformin, and anti-neoplastic agents have been associated with weight loss.

Impaired Absorption:

- Cholestasis
- Pancreatic insufficiency with associated malabsorption
- Short bowel syndrome with malabsorption
- Small bowel disease
- Post-gastrectomy & stapling
- Drugs (laxative abuse, olestra, alpha glucosidase inhibitors)
- Parasitic infestations (giardiasis, worms, etc.)
- AIDS

Increased Nutritional Loss:

- Uncontrolled diabetes mellitus: Dehydration and loss of calories from glycosuria can reduce weight
- Persistent diarrhea resulting in hypovolemia and malnutrition
- Recurrent vomiting
- Chronic entero-cutaneous fistula resulting in loss of fluids and protein

Increased Demand:

- Thyrotoxicosis: Increased energy expenditure and some malabsorption⁶ occurs. However, up to 10% of patients may gain weight.
- Pheochromocytoma: Excessive adrenergic activity leads to increase in basal metabolic rate (BMR).
- Fever resulting in increased in BMR (7% for each degree of temperature elevation) and increased energy expenditure
- Malignancy
- Emotional states including manic phase of bipolar disorder
- Amphetamine/Cocaine dependence: They influence the satiety center in the hypothalamus.

Initial Evaluation:

History: Salient points are:

- History of daily food intake including calorie count
- Change in clothing size
- Appetite
- Affordability of food
- Rapid versus slow weight loss and fractional change in weight
- Previous weight records
- Growth curves and charts in children
- Dieting: Is weight loss involuntary?
- Is there intermittent fluctuation in weight or did weight loss occur in a patient with stable weight?
- History of risk factors for HIV, chronic infections and cancer.

In elderly patients, ask about medication history including over the counter medicines, some of which can cause anorexia and gastrointestinal symptoms.

Physical Examination: Salient points are:

- Anthropometrics⁸
- Fever, tachycardia, pallor, ecchymoses, jaundice
- Signs of wasting: Loss of sub-cutaneous fat, muscle atrophy and wasting
- Signs of volume depletion: decreased skin turgor, sunken eyes, and orthostatic changes
- Signs of malnutrition, e.g., glossitis, stomatitis, cheilosis, dermatosis
- Lymphadenopathy

Laboratory and Other Tests:

Because the differential diagnosis is so vast, laboratory testing should be selective. The history and physical examination should narrow down the differential diagnosis and a specific etiology can be confirmed or refuted by further testing. Patients with no symptoms suggestive of serious illness and with a normal physical examination are at low risk. It is reasonable to expectantly observe them for 4 weeks with nutritional advice and a diary of their food intake. In patients for whom the history and physical suggest a significant underlying disorder, one can proceed to focused testing.

Routine Tests:

- Serum chemistries including electrolytes, calcium, creatinine, transaminases
- Serum albumin, prealbumin, and cholesterol

- Chest radiograph in smokers and with history of COPD

Decreased Intake:

- Serum levels of drugs like digoxin, quinidine, etc. in patients on those drugs
- Endoscopic/Radiological evaluation and/or *H. pylori* testing if there are symptoms of upper gastrointestinal tract disease
- HIV testing if risk factors are elicited

Impaired Absorption:

- Stool hemocult testing
- Gross and microscopic examination of stool
- Qualitative 72 hour stool fat (7g/day rules out malabsorption)
- Serum carotene and D-xylose tests (both are not dependent on pancreas for absorption and can distinguish between pancreatic dysfunction and small bowel disease)
- Small bowel biopsy may be necessary for the diagnosis of sprue.

Increased Nutritional Loss

- Urine analysis for glycosuria

Increased Demand:

- Serum TSH
- Tests for occult malignancy: These should be tailored to individual patients.

Caution should be exercised while ordering tumor markers. They should be reserved for prognosticating and to detect recurrence.

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