Table 6-2. Physical Manifestations of Malnutrition	
Nutrient Deficiency	*Physical Manifestation*
Protein	Edema, hypoalbuminemia, enlarged liver, diarrhea
Protein/energy	Muscle wasting; sparse, thin, dry, brittle hair; dry, inelastic skin; muscle weakness
Vitamin A	Poor visual accommodation to dark, Bitot's spots (eyes), dryness of the eyes, hair loss, impaired taste, gooseflesh
Vitamin D	Bowed legs, beading of ribs, other skeletal deformities (rickets)
Vitamin K	Bleeding (poor coagulation of blood)
Thiamine B_1	Cardiac enlargement, mental confusion, irritability, calf muscle tenderness and foot drop, hyporeflexia, hyperesthesia, paresthesia
Riboflavin B_2	Fissures around mouth; reddened, scaly, greasy skin around the nose and mouth; magenta-colored tongue
Niacin B_3	Bright red, swollen, painful tongue; pellagrous dermatitis; depression; insomnia; headaches; dizziness; dementia; diarrhea
Pyridoxine B_6	Neuropathies, glossitis, nasolabial seborrhea
Folic acid	Red, painful, shiny, smooth tongue; skin hyperpigmentation
Vitamin B_{12}	Mild dementia; sensory losses in hands and feet; red, smooth, shiny, painful tongue; mild jaundice; optic neuritis; anorexia; diarrhea
Vitamin C	Joint tenderness and swelling, hemorrhages under the skin, spongy gums that bleed easily, poor wound healing, petechiae
Essential fatty acids	Sparse hair growth; dry, flaky skin; depression and psychosis; dementia
Calcium	Poor reflexes, poor cardiovascular accommodation to activity, slow mental processing, depression, dementia
Magnesium	Lethargy and weakness, anorexia and vomiting, tremor, convulsions
Iodine	Goiter
Iron	Pallor; pale, atrophic tongue; spoon-shaped nails; pale conjunctivae
Zinc	Sluggish muscle contraction, poor wound healing, diminished taste and appetite, dermatitis, hair loss, diarrhea

foods by the person. The latter may help to determine the need for specific supplemental nutrients or enzymes (lactase, other disaccharidases, or pancreatic enzymes).

Malnutrition is an important predictor of morbidity and mortality. In older adults, various subjective nutritional assessments have been developed that provide high interrater agreement, correlate with other measures of nutritional status, and predict subsequent morbidity. Familiarizing the rehabilitation professional with the information garnered from such tools is helpful in synchronizing nutritional with functional goals. Standardized staging criteria for degree of nutritional deficit or risk have been developed and validated in 2 commonly used tools.[1,51,54-56]

The Subjective Global Assessment (SGA) is a reproducible and valid tool for determining nutritional status in the institutional[54] and community-dwelling older adults.[50] This evaluation tool has been validated in a number of patient populations including surgical, HIV, AIDS, renal dialysis, and cancer populations.[1,56] With appropriate training, the method is sensitive and specific and has little interobserver variability. Figure 6-1 provides an example of information obtained by the SGA.[55] It is composed of a patient survey and clinician evaluation that correlates with physical measures of skinfold caliper, weight and height measures, and nutritional status and has been determined to be highly predictive for morbidity and mortality.[50] The SGA has been found to be particularly sensitive in identifying older individuals who are undernourished or at risk for developing undernutrition.[55] Similarly, the Mini Nutritional Assessment (MNA) is designed and validated to provide a single, rapid assessment of nutritional status in older adults in outpatient clinics, hospitals, and nursing homes.[52] The MNA has been found to be an efficient method for detecting malnutrition in older adults and also accurately predicts 1-year mortality.[57] It has been translated into several languages and validated in many clinics around the world. The MNA is composed of simple measurements and brief questions that can be completed in about 10 minutes. Figure 6-2 provides a sample of the information collected by the MNA in its various formats.[57,58] Like the SGA, the