

## Signs and Symptoms of Nutritional Deficiencies

More subtle forms of malnutrition can and do occur and are related to inadequate (or excessive) intakes of distribution and utilization of, or abnormal excretion of nutrient end-products.

Region of Body	Abnormal Findings	Possible Vitamin/Mineral Deficiencies	Comments
Skin	<p>Pallor, cyanosis</p> <p>Yellow Coloring</p> <p>Dermatitis, red scaly rash or hyperkeratosis</p> <p>Bruising, petechiae, unhealed cuts/wounds</p> <p>Purpura</p> <p>Xerosis, dry scaling</p>	<p>Iron, folate or B12, biotin, copper carotene or bilirubin (excess related)</p> <p>B-complex vitamins (riboflavin, niacin, Vitamin B6), vitamin A, K and zinc</p> <p>Vitamins K, C and zinc</p> <p>Vitamin C, Vitamin K or excessive Vitamin E</p> <p>Essential Fatty Acids</p>	<p>Skin should be uniform in color and appearance.</p>
Nails	<p>Pallor or white coloring. Clubbing, spoon-shape, or transverse ridging/banding; excessive dryness, darkness nails, curved nail ends</p> <p>Mottled, pale nails; poor blanching</p>	<p>Iron, protein, vitamin B12, folate, zinc</p> <p>Vitamin A or C deficiency</p>	<p>Nail bed should be free of splints, uniform in shape, rounded and smooth. Color and shape changed can reflect other medical conditions</p>
Head/Hair	<p>Dull/lackluster, easily plucked</p> <p>Alopecia, thin, sparse</p> <p>Depigmentation of hair; scaly/flaky scalp, color changes</p>	<p>Protein, malnutrition, Essential Fatty Acid Deficiency (EFAD)</p> <p>Iron, Zinc, Biotin, protein deficiency</p> <p>Protein-calorie malnutrition, manganese, selenium, copper deficiency</p>	<p>Scalp should appear normal in color and texture with no diffused hair patches. Hair color and texture should appear uniform, thick, firm, and not easily plucked</p>
Eyes	<p>Vision changes, particularly at nighttime; dryness, foamy spots on eyes (Bitot's spots). Itching, burning, corneal inflammation</p>	<p>Vitamin A, riboflavin, niacin</p>	<p>The eyes should appear bright with smooth cornea; along with pink and moist membranes</p>

	Pallor conjunctiva; yellowish icterus	Iron, folate, B12, copper; excessive carotenoids	
Mouth, Extra-/Intraoral Cavity	<p>Corners of the mouth are swollen (angular stomatitis) and vertical cracks of the lips (cheilosis)</p> <p>Magenta color, beefy red tongue (glossitis) and atrophied papillae</p> <p>Pallor and generalized inflamed mucosa</p> <p>Bleeding gums and poor dentition</p> <p>Distorted or diminished taste (hypogeusia)</p>	<p>B-complex vitamins (riboflavin, niacin, vitamin B6)</p> <p>Riboflavin, niacin, folate, B12, iron</p> <p>Iron, B12, or folate, B-complex</p> <p>Vitamin C</p> <p>Zinc</p>	The extra-oral cavity should be without cracks and sores, appearing smooth in color. The intraoral cavity should appear free of swelling around the gum and tongue.
Neck/Chest	<p>Distended neck veins</p> <p>Enlarged thyroid</p> <p>Muscle and fat wasting with prominent bony chest region</p>	<p>Fluid overload</p> <p>Iodine</p> <p>Calorie and protein depletion</p>	Note: this region can provide information regarding muscle and fluid status.
Musculo-skeletal/ Lower Extremities	<p>Poor muscle control (ataxia)</p> <p>Swollen and painful joints; epiphyses at wrist</p> <p>Rickets, knock knees, bowleg</p>	<p>Thiamin, copper</p> <p>Vitamin C and D</p> <p>Vitamin D, calcium</p>	<p>Generalized muscle mass, strength, stability, movement and balance can be assessed via various functional tests (e.g. hand grip, gait speed and bioelectric-impedance analysis.</p> <p>Edema rating scale can be used to assess fluid accumulation along with skin turgor test.</p>

Adapted from Table 3: Utilization of nutrition-focused physical assessment in identifying micronutrient deficiencies. *Nutr Clin Pract.* 2015;30(2);194-202, Pediatric Nutrition Focused Physical Exam Pocket Guide and The Practitioner's Guide to Nutrition-Focused Physical Exam of Infants, Children, and Adolescents