

Nutritional disorders

Nutritional Disorders

- Protein–energy malnutrition (PEM)
- Vitamin A deficiency (VAD)
- Iron Deficiency
- Vitamin B complex Deficiency
- Iodine deficiency

Protein - energy malnutrition (PEM)

- **Protein–energy malnutrition (PEM)** or **protein–calorie malnutrition** refers to a form of malnutrition where there is inadequate calorie or protein intake.

Types include:

- Kwashiorkor (protein malnutrition predominant)
- Marasmus (deficiency in calorie intake)
- Marasmic Kwashiorkor (marked protein deficiency and marked calorie insufficiency signs present, sometimes referred to as the most severe form of malnutrition)

Marasmus

- **Marasmus** is a form of severe malnutrition characterized by energy deficiency. A child with marasmus looks emaciated.
- Body weight is reduced to less than 60% of the normal (expected) body weight for the age.
- Marasmus occurrence increases prior to age 1

Marasmus

Clinical Manifestations:

1. Wasting
2. Muscle wasting
3. Growth retardation
4. Mental changes
5. No edema
6. Variable-subnormal temp,
slow PR, good appetite,
often w/diarrhea, etc



Kwashiorkor

- Kwashiorkor occurrence increases after 18 months.
- Marasmus can be distinguished from kwashiorkor in that kwashiorkor is protein deficiency with adequate energy intake

Kwashiorkor



Kwashiorkor

Clinical Manifestations:

A. Diagnostic Signs

1. Edema
2. Muscle wasting
3. Psychomotor changes

B. Common Signs

1. Hair changes
2. Diffuse depigmentation of skin
3. Moon face
4. Anemia

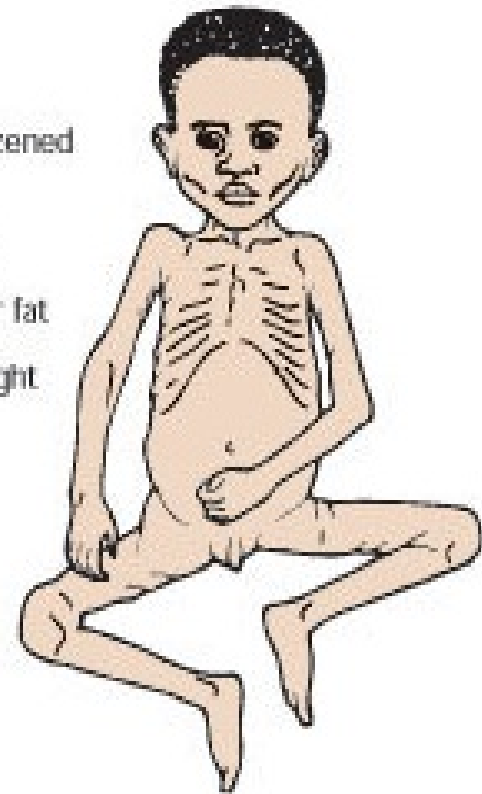
kwashiorkor

- swelling of legs (oedema)
- sparse hair
- moon face, with little interest in surroundings
- flaky appearance of skin
- swollen abdomen
- thin muscles, but fat present



marasmus

- normal hair
- old man or wizened appearance
- thin limbs with little muscle or fat
- very underweight body

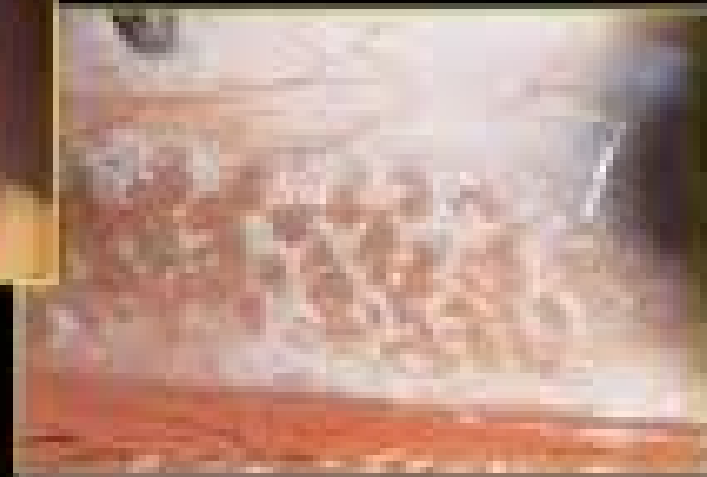


Vitamin A deficiency

- **Vitamin A deficiency (VAD)** is a lack of vitamin A in humans.
- It is common in poorer countries but rarely seen in more developed countries.
- **Nyctalopia** (night blindness) is one of the first signs of VAD.
- **Xerophthalmia,**
- **Keratomalacia,** and
- **Complete blindness**
- Can also occur since Vitamin A has a major role in phototransduction.



Vitamin A deficiency
induced
Xerophthalmia.
The leading cause
of childhood
blindness¹



¹ Bulletin WHO 2001 79 (3) 214



Iron deficiency anemia symptoms

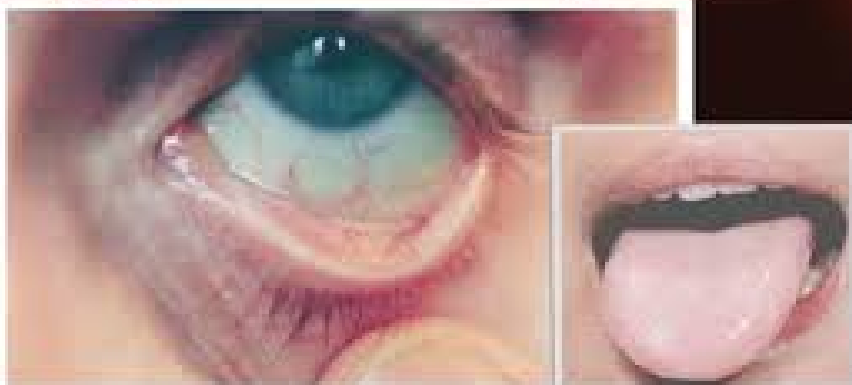
Anemia that comes on quickly often has greater symptoms which may include:

- confusion,
- feeling like one is going to pass out
- increased thirst.
- There needs to be significant anemia before a person becomes noticeably pale.
- There may be additional symptoms depending on the underlying cause.

Iron deficiency anemia symptoms

- Easy fatigue and loss of energy
- Unusually rapid heart beat, particularly with exercise
- Shortness of breath and headache, particularly with exercise
- Difficulty concentrating
- Dizziness
- Pale skin
- Leg cramps
- Insomnia

Anemia symptoms



Vitamin B complex Deficiency

Vitamin B₁ (Thiamine):

- Deficiency causes [beriberi](#). Symptoms of this disease of the [nervous system](#) include weight loss, emotional disturbances,
- [Wernicke's encephalopathy](#) (impaired sensory perception), weakness and pain in the limbs, periods of [irregular heartbeat](#), and [edema](#) (swelling of bodily tissues).

Vitamin B₂ (Riboflavin):

Deficiency causes [ariboflavinosis](#). Symptoms may include

- [cheilosis](#) (cracks in the lips), high sensitivity to sunlight,
- [angular cheilitis](#), [glossitis](#) (inflammation of the tongue),
- [seborrheic dermatitis](#) or

Vitamin B complex Deficiency

Vitamin B₃ (Niacin):

Deficiency, along with a deficiency of [tryptophan](#) causes [pellagra](#).

Symptoms include

- aggression
- [dermatitis](#)
- [insomnia](#)
- [weakness](#)
- mental confusion
- [diarrhea](#)
- In advanced cases, pellagra may lead to [dementia](#) and death (the 3(+1) Ds: dermatitis, diarrhea, dementia, and death).

Vitamin B₅ (Pantothenic acid)

- Deficiency can result in [acne](#) and [paresthesia](#), although it is uncommon.

- **Vitamin B₆ (Pyridoxin)**

- The classic clinical syndrome for vitamin B₆ deficiency is a
- [seborrhoeic dermatitis](#)-like eruption

Vitamin B₇ (Biotin):

- Deficiency does not typically cause symptoms in adults but may lead to impaired growth and neurological disorders in infants.

Vitamin B₉ (Folic acid):

- Deficiency results in a [macrocytic anemia](#), and elevated levels of [homocysteine](#).
- Deficiency in pregnant women can lead to birth defects.

- **Vitamin B₁₂ (Cobalamin)**
- Deficiency results in a [macrocytic anemia](#), [pernicious anemia](#) elevated [homocysteine](#), [peripheral neuropathy](#), memory loss and other cognitive deficits.

Iodine deficiency

- **Iodine deficiency** is a lack of the trace element iodine
- It may result in **goiter** (so-called endemic goiter), as well as **cretinism**,
- which results in developmental delays and other health problems.
- Iodine deficiency is an important public health issue as it is a preventable cause of intellectual disability

Iodine Deficiency Disorders



Goiter



Cretinism