**CLASSIFICATION OF MALNUTRITION IN CHILDREN**
**DEFINITIONS OF MALNUTRITION**

|  |  |  |
| --- | --- | --- |
| **Classification** | **Definition** | **Grading** |
| Gomez | Weight below %median WFA | Mild (grade 1)Moderate (grade 2)Severe (grade 3) | 75%–90% WFA60%–74% WFA<60% WFA |
| Waterlow | z-scores (SD) belowmedian WFH | MildModerateSevere | 80%–90% WFH70%–80% WFH<70% WFH |
| WHO (wasting) | z-scores (SD) belowmedian WFH | ModerateSevere | -3%</= z-score < -2z-score < -3 |
| WHO (stunting) | z-scores (SD) belowmedian HFA | ModerateSevere | -3%</= z-score < -2z-score < -3 |
| Kanawati | MUAC divided byoccipitofrontal headcircumference | MildModerateSevere | <0.31<0.28<0.25 |
| Cole | z-scores of BMI for age | Grade 1Grade 2Grade 3 | BMI for age z-score < -1BMI for age z-score < -2BMI for age z-score < -3 |

*Abbreviations: BMI, body mass index; HFA, height for age; MUAC, mid-upper arm circumference; SD, standard deviation; WFA, weight for age; WFH, weight for height; WHO, World Health Organization.*

**Gomez Classification:** The child’s weight is compared to that of a normal child (50th percentile) of the same age. It is useful for population screening and public health evaluations.

* Percent of reference weight for age = [(patient weight) / (weight of normal child of same age)] \* 100

**Waterlow Classification:** Chronic malnutrition results in stunting.  Malnutrition also affects the child’s body proportions eventually resulting in body wastage.

* Percent weight for height = [(weight of patient) / (weight of a normal child of the same height)] \* 100
* Percent height for age = [(height of patient) / (height of a normal child of the same age)] \* 100

**CLASSIFICATION OF MALNUTRITION IN CHILDREN**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mild Malnutrition | Moderate Malnutrition | Severe Malnutrition |
| Percent Ideal Body Weight | 80-90% | 70-79% | < 70% |
| Percent of Usual Body Weight | 90-95% | 80-89% | < 80% |
| Albumin (g/dL) | 2.8-3.4 | 2.1-2.7 | < 2.1 |
| Transferrin (mg/dL) | 150 – 200 | 100 – 149 | < 100 |
| Total Lymphocyte Count (per µL) | 1200 – 2000 | 800 – 1199 | < 800 |

**Wellcome Classification:** evaluates the child for edema and with the Gomez classification system.

|  |  |  |
| --- | --- | --- |
| Weight for Age (Gomez) | With Edema | Without Edema |
| 60-80% | kwashiorkor | undernutrition |
| < 60% | marasmic-kwashiorkor | marasmus |

**References:**

1. Gomez F, Galvan RR, Cravioto J, Frenk S. Malnutrition in infancy and childhood, with special reference to kwashiorkor. Adv Pediatr. 1955;7:131–169. [[Medline]](https://pubmed.ncbi.nlm.nih.gov/14349775/)
2. Waterlow JC. Classification and definition of protein-calorie malnutrition. Br Med J. 1972 Sep 2;3(5826):566-9. [[Medline]](https://pubmed.ncbi.nlm.nih.gov/4627051/)
3. Waterlow JC, Buzina R, Keller W, Lane JM, Nichaman MZ, Tanner JM. The presentation and use of height and weight data for comparing the nutritional status of groups of children under the age of 10 years. Bull World Health Organ. 1977;55(4):489–498. [[Medline]](https://pubmed.ncbi.nlm.nih.gov/304391/)
4. Grover Z, Ee LC. Protein energy malnutrition. Pediatr Clin North Am. 2009 Oct;56(5):1055-68. [[Medline]](https://pubmed.ncbi.nlm.nih.gov/19931063/)
5. Management of Severe Acute Malnutrition in Infants and Children [[MedicalCriteria.com]](https://medicalcriteria.com/web/es/severe-malnutrition/)