|  |  |  |  |
| --- | --- | --- | --- |
|  | **MILD MALNUTRITION** | **MODERATE MALNUTRITION** | **SEVERE MALNUTRITION** |
| **Individual Growth Points** |  |  |  |
| Weight-for-length | -1.0 to -1.9 z score | -2.0 to 2.9 z score | < -3 z score |
| BMI-for-age | -1.0 to -1.9 z score | -2.0 to 2.9 z score | < -3 z score |
| Mid Upper Arm Circumference A | -1.0 to -1.9 z score | -2.0 to 2.9 z score | < -3 z score |
| **Growth Trends** |  |  |  |
| Weight gain velocity B  (0-24 months) | <75% expected | <50% expected | <25% expected |
| Deceleration in weight-for-length | Decline of 1.0-1.9 z score | Decline in 2.0-2.9 z score | Decline in 3.0 z score or greater |
| Deceleration in BMI-for-age | Decline of 1.0-1.9 z score | Decline of 2.0-2.9 z score | Decline of 3.0 z score or greater |
| Weight loss (2 – 20 years) | Loss of 5 to 7.49% usual body weight | Loss of 7.5 to 9.99% usual body weight | Loss of 10% or greater usual body weight |
| **Nutrient Intake** |  |  |  |
| Inadequate nutrient intake (energy/protein) | 51-75% estimated need | 26-50% estimated need | <25% estimated need |

**Acute Malnutrition: Less than 3 months**

**Chronic Malnutrition: Greater than 3 month**

1. Mid-upper arm circumference z-score data available for ages 2mo to 18yrs. See attached reference.
2. See attached reference for expected weight gain velocity.

Reference:

* Becker P, Carney LN, Corkins MR, Monczka J, Smith E, et al. Consensus statement of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition: indicators recommended for identification and documentation of pediatric malnutrition. Nutr Clin Pract. 2015;30(1):147-161.

**Reference Index**

1. Appropriate Use of Growth Charts
2. Expected Weight Gain Velocity
3. Mid Upper Arm Circumference Z-scores for Children 2 months to 18 years
4. Appropriate Use of Growth Curves
5. For children 0-24 months:
   1. Use WHO growth curves
   2. Use weight-for-length to assess growth
6. For children older than 24 months:
   1. Use CDC growth curves
   2. Use BMI-for-age to assess growth
7. Expected Weight Gain Velocity

|  |  |
| --- | --- |
| **AGE** | **AVERAGE WEIGHT GAIN VELOCITY** |
| Premie less than 2 kg | 15-20 g/kg/day |
| Premie greater than 2 kg\* | 20 – 30 g/day |
|  |  |
| 0 – 4 months | **23 – 34 grams/day** |
| 4 – 8 months | **10 – 16 grams/day** |
| 8 – 12 months | **06 – 11 grams/day** |
| 12 – 16 months | **05 – 09 grams/day** |
| 16 – 24 months | **04 – 09 grams/day** |

\*Use premie weight gain goal until gestation adjusted age reaches 40 weeks. Then use gestation adjusted age to determine weight gain goals using term infant standards.

1. Mid Upper Arm Circumference (MUAC) Z-Scores

CDC Z-score reference data is available for ages 2 months to 18 years of age

To access Z-scores:   
 1) Go to <http://peditools.org/cdcmuac>

2) Enter the required information

3) Click “Submit” to obtain z-score information

**References**

Expected Weight Gain Velocity- Adapted from Texas Children’s Hospital Pediatric Nutrition Reference Guide. 10th Edition. 2013.

* *Anderson DM, Eichenwald EC, Chan SW, et al, eds. Guideline for Acute Care of the Neonate, 18th ed, Houston TX: Section of Neonatology, Department of Pediatrics, Baylor College of Medicine 2010.*
* *WHO Child Growth Standards (*[*www.who.int/childgrowth/en*](http://www.who.int/childgrowth/en)*), accessed July 1, 2010.*

Mid Upper Arm Circumference –

* ["Construction of Lambda, Mu, Sigma Values for Determining Mid-Upper Arm Circumference z Scores in U.S. Children Aged 2 Months Through 18 Years." Abdel-Rahman et al, Nutr Clin Practice 2017; 32:68-76](http://www.ncbi.nlm.nih.gov/pubmed/27856693)
* PediTools: Clinical tools for pediatric providers (<http://peditools.org/cdcmuac>), *accessed May 15, 2019*