PRACTICE TOOL

Key Nutrition Screening, Assessment, and Malnutrition Diagnostic Processes and Tools for Children and Infants

The piece provides an overview of the nutrition screening, assessment, and diagnostic tools for children and infants. It can be used in conjunction with the ASPEN Pediatric Nutrition Care Pathway and other resources in the ASPEN Malnutrition Solution Center at nutritioncare.org/Malnutrition.

Nutrition Screening

What is nutrition screening, and what tool should be used for screening?

- Nutrition screening is a process for identifying individuals who may be malnourished or at risk for malnutrition and determining whether they require a comprehensive nutrition assessment and appropriate intervention.[1]
- Nutrition screening should be conducted within 24 hours of hospital admission.
- ASPEN suggests using a validated nutrition screening tool for pediatric patients. See Table 1.

Table 1. Selected Validated Nutrition Screening Tools for Children and Infants[2]

Nutrition Screening Parameters	PMST[3]	PNST[4]	PYMS[5]	STAMP[6]	STRONGKIDS[7]
Appetite/intake	X				
Body mass index	X		X	X	
Weight change/loss		X	X		X
Wt/Age, Wt/Length, Ht Velocity	X	X		X	X
GI symptoms					X
Medical condition, diagnosis, severity of disease or treatment			X	X	
Reduced intake due to pain					X
Pre-existing intervention					X
Visibly under- or overweight		X			

PMST, Pediatric Malnutrition Screening Tool; PNST, Pediatric Nutrition Screening Tool; PYMS, Pediatric Yorkhill Malnutrition score; STAMP, Screening Tool for the Assessment of Malnutrition; STRONGKIDS, Screening Tool for Risk on Nutritional Status and Growth. Note: Some tools incorporate actual measurements as part of the tool while others do not. See also: Pediatric Nutritional Screening Tools for Use in Hospitalized Children.

Neonates and Children Nutritionally-at-Risk for Undernutrition

Neonates should be considered at nutrition risk if they have any of the following:[1,14]

High Risk[8]

- Extremely Preterm: less than 28 weeks at birth.
- Extremely low birth weight: less than 1000 g at birth.
- Infant establishing feeds after episode of necrotizing enterocolitis or gastrointestinal perforation.
- Infants with severe congenital gastrointestinal malformations (e.g., gastroschisis).

See Preterm and Neonatal Malnutrition Indicators on page 3.

Moderate Risk[8]

- Preterm: 28th–31st weeks at birth, otherwise well.
- Intrauterine growth restriction.
- Very low birth weight 1000–1500 g at birth.
- Illness or congenital anomaly that may compromise feeding.
- Low birth weight (less than 2500 g) at birth.[9]
- Birth weight greater than 2 standard deviations below the mean (approximately the 3rd percentile) for gestational age on fetal weight curves.[9]
- Decline in weight-for-age z score.
- Weight gain velocity less than expected.

Children should be considered at nutrition risk if they have any of the following:[1]

- Weight for length, weight for height, by gender less than 10th percentile (–1.28 z-score).[10]
- BMI for age by gender less than 5th percentile (< –1.64 z-score).[9]
- Increased metabolic requirements (such as fever, hypermetabolism, chronic seizures).
- Impaired ability to ingest or tolerate oral feeding.
- Documented inadequate provision of or tolerance to nutrients.
- Inadequate weight gain or a significant decrease in usual growth percentile.

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Nutrition Assessment

What is nutrition assessment, and what method or measure should be used to identify malnutrition?

- Nutrition assessment is a comprehensive approach to identifying nutrition-related problems. It uses a combination of medical, nutrition, medication, and client histories; nutrition-focused physical examination (NFPE); anthropometric measurements; and biomedical data/medical diagnostic tests and procedures.[11] NFPE includes assessing:
  - Muscle, fat, and fluid assessment
  - Micronutrient deficiency review
  - Functional status assessment
- Nutrition assessment is the next step after identifying nutritional risk through screening.
- Nutrition assessment findings are then applied to a diagnostic framework to derive the malnutrition diagnosis.

Malnutrition Diagnoses

Pediatric malnutrition (undernutrition) is defined as an imbalance between nutrient requirement and intake, resulting in cumulative deficits of energy, protein, or micronutrients that may negatively affect growth, development, and other relevant outcomes. Based on its etiology, malnutrition is either illness-related (1 or more diseases/injuries directly result in nutrient imbalance) or caused by environmental/behavioral factors associated with decreased nutrient intake/delivery (or both). Pediatric malnutrition pertains to children aged 1 month to 18 years.[12] See Table 2.

Table 2. Diagnostic Frameworks for Malnutrition in Children or Infants

Indicators of Malnutrition	Academy and ASPEN (Pediatrics)[13]	Preterm and Neonates[14]
Primary Indicators When a Single Data Point is Available		
Weight-for-height z score	X	
BMI-for-age z score	X	
Length/height-for-age z score	X	
Mid–upper arm circumference	X	
Primary Indicators When 2 or More Data Points are Available		
Weight gain velocity (<2 years of age)	X	X
Weight loss (2–20 years of age)	X	
Deceleration in weight for length/height z score	X	
Inadequate nutrient intake	X	X
Decline in weight-for-age z score		X
Days to regain birthweight		X
Linear growth velocity		X
Decline in length-for-age z score		X

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Academy and ASPEN Consensus Criteria

The Academy of Nutrition and Dietetics (the Academy) and the American Society for Parenteral and Enteral Nutrition utilizing an evidence-informed, consensus-derived process, recommend that a standardized set of diagnostic indicators be used to identify and document pediatric malnutrition in routine clinical practice.[13]

- When a single data point is available, the recommended indicators include z scores for weight-for-height/length, body mass index-for-age, or length/height-for-age or mid-upper arm circumference.
- When 2 or more data points are available, indicators may also include weight gain velocity (<2 years of age), weight loss (2–20 years of age), deceleration in weight for length/height z score, and inadequate nutrient intake.

Preterm and Neonates Malnutrition Indicators

In 2018, a committee of expert preterm/neonatal registered dietitian nutritionists published recommended indicators for the diagnosis of malnutrition in preterm infants and neonates. This was in response to a need for indicators appropriate to the preterm/neonatal population, given the emphasis on diagnosing malnutrition in the pediatric and adult populations.[14] A follow-up paper answers questions regarding the three categories of indicators, billing, and reimbursement.[15]

Diagnostic Codes

ICD-10 CM Codes to Identify Medical Diagnosis of Malnutrition in Infants and Children

This is the complete list of ICD-10 CM codes used for coding purposes.[16,17] The highlighted codes are those used most often as of 2019.[18]

Code	Description
E40	Kwashiorkor
E41	Nutritional marasmus
E43	Unspecified severe protein-calorie malnutrition
E44.0	Moderate protein-calorie malnutrition
E44.1	Mild protein-calorie malnutrition
E46	Unspecified protein-calorie malnutrition
R62.51	Failure to thrive (child)
R63.3	Feeding difficulties
R63.4	Abnormal weight loss
R63.6	Underweight
R64	Cachexia
K91.2	Postsurgical malabsorption, not elsewhere classified
T74.02XA	Child neglect or abandonment, confirmed, initial encounter
T74.02XD	Child neglect or abandonment, confirmed, subsequent encounter
T74.02XS	Child neglect or abandonment, confirmed, sequela
T76.02XA	Child neglect or abandonment, suspected, initial encounter
T76.02XD	Child neglect or abandonment, suspected, subsequent encounter
T76.02XS	Child neglect or abandonment, suspected, sequela
Z68.51	Body mass index (BMI) pediatric, less than 5th percentile for age

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