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<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
</tr>
<tr>
<td>AI</td>
<td>adequate intake</td>
</tr>
<tr>
<td>AMA</td>
<td>American Medical Association</td>
</tr>
<tr>
<td>ASPEN</td>
<td>American Society for Parenteral and Enteral Nutrition</td>
</tr>
<tr>
<td>BMI</td>
<td>body mass index</td>
</tr>
<tr>
<td>BMR</td>
<td>basal metabolic rate</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>CPE</td>
<td>Continuing Professional Education</td>
</tr>
<tr>
<td>DRI</td>
<td>Dietary Reference Intake</td>
</tr>
<tr>
<td>EAR</td>
<td>Estimated Average Requirement</td>
</tr>
<tr>
<td>EER</td>
<td>Estimated Energy Requirement</td>
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</table>
eNCPT  electronic Nutrition Care Process Terminology
Hct  hematocrit
Hgb  hemoglobin
INTER-GROWTH-21st  International Fetal and Newborn Growth Consortium for the 21st Century
MCV  mean cell volume
MUAC  mid–upper arm circumference
NCP  Nutrition Care Process
NFPE  nutrition-focused physical examination
NHANES  National Health and Nutrition Examination Survey
NRST-CF  Nutrition Risk Screening Tool for Children and Adolescents with Cystic Fibrosis
NutriSTEP  Nutrition Screening for Toddlers and Preschoolers
OFC  occipital frontal circumference
PAL  physical activity level
<table>
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<tr>
<td>PeDiSMART</td>
<td>Pediatric Digital Scaled Malnutrition Risk Screening Tool</td>
</tr>
<tr>
<td>PNST</td>
<td>Pediatric Nutrition Screening Tool</td>
</tr>
<tr>
<td>PYMS</td>
<td>Paediatric Yorkhill Malnutrition Score</td>
</tr>
<tr>
<td>RDA</td>
<td>Recommended Dietary Allowance</td>
</tr>
<tr>
<td>REE</td>
<td>Resting Energy Expenditure</td>
</tr>
<tr>
<td>RQ</td>
<td>respiratory quotient</td>
</tr>
<tr>
<td>SAM</td>
<td>severe acute malnutrition</td>
</tr>
<tr>
<td>SAS</td>
<td>Statistical Analysis System</td>
</tr>
<tr>
<td>SDs</td>
<td>standard deviations</td>
</tr>
<tr>
<td>SGNA</td>
<td>Subjective Global Nutritional Assessment</td>
</tr>
<tr>
<td>STAMP</td>
<td>Screening Tool for the Assessment of Malnutrition in Paediatrics</td>
</tr>
<tr>
<td>STRONGkids</td>
<td>Screening Tool for Risk on Nutritional Status and Growth</td>
</tr>
<tr>
<td>TEE</td>
<td>total energy expenditure</td>
</tr>
<tr>
<td>TIBC</td>
<td>total iron-binding capacity</td>
</tr>
<tr>
<td>TSF</td>
<td>triceps skinfold</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>UL</td>
<td>Tolerable Upper Intake Level</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>USDA</td>
<td>US Department of Agriculture</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WIC</td>
<td>Women, Infants, and Children</td>
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Preface

The challenge of accurately assessing and diagnosing pediatric nutrition problems is endlessly fascinating to clinicians and is critical to helping families care for their children. While some children present with a constellation of concerns that seem familiar and easy to address, there is virtually always a unique twist that makes each child’s nutrition problem an individual puzzle to put together. Assessing each domain of nutrition information is necessary to bring the puzzle into focus.

Understanding of how to assess, interpret, and communicate each piece of the assessment puzzle continues to evolve. This evolution sometimes leads us to circle back again to our most basic ways of defining and describing nutrition risk. Over the past decade, experts have revisited the concept of pediatric malnutrition, resulting in new ways of assessing and classifying it. This third edition of the *Pocket Guide to Pediatric Nutrition Assessment* includes updated recommendations based on the latest expert guidelines published by the Academy of Nutrition and Dietetics, the American Society
for Parenteral and Enteral Nutrition (ASPEN), and the World Health Organization (WHO). The list below provides a brief overview of what is new in the third edition:

Chapter 1:
- Updated and expanded description of nutrition assessment as the first step of the Nutrition Care Process

Chapter 2:
- Academy of Nutrition and Dietetics/ASPEN indicators of pediatric malnutrition (undernutrition)
- Summary and discussion of validated pediatric malnutrition risk screening tools

Chapter 3:
- Updated and expanded list of specialized growth charts
- Discussion of $z$ scores
- Table of resources for determining anthropometric $z$ scores
- Expanded discussion of mid–upper arm circumference and addition of percentile tables
- WHO and UNICEF definition of severe acute malnutrition
- Academy of Nutrition and Dietetics/ASPEN criteria to identify and classify degree of malnutrition
Chapter 5:
- Updated baby foods
- Updated tables of amounts needed from each food group to meet calorie levels recommended by the US Department of Health and Human Services and the US Department of Agriculture in the *2015–2020 Dietary Guidelines for Americans* and MyPlate

Chapter 6:
- Updated and expanded information on pediatric nutrition–focused physical exam

Chapter 8:
- Inclusion of key Dietary Reference Intake (DRI) values
- Sample calculation for estimating energy needs using the Estimated Energy Requirement (EER) equations
- Basal metabolic rate (BMR) prediction equations for obese children and adolescents
- Updated references for nutrients of special concern

The goal is for this pocket guide to support practitioners in putting together the pieces of the nutrition assessment puzzle for each child assessed, using the most current tools and language.

Beth L. Leonberg, MS, MA, RDN, CSP, LDN, FAND
**BOX 1.2  Step 1: Nutrition Assessment and Reassessment (cont.)**

**Data sources/tools for assessment**
- Screening or referral form
- Client interview
- Medical or health records
- Consultation with other caregivers, including family members
- Community-based surveys and focus groups
- Statistical reports, administrative data, and epidemiologic studies

**Types of data collected**
- Food- and nutrition-related history
- Anthropometric measurements
- Biochemical data, medical tests, and procedures
- Nutrition-focused physical examination findings
- Client history

**Nutrition assessment components**
- Review data collected for factors that affect nutrition and health status.
- Cluster individual data to identify at least one nutrition diagnosis as described in diagnosis reference sheets.
- Identify accepted standards, recommendations, and/or goals by which data will be compared.
BOX 1.2  Step 1: Nutrition Assessment and Reassessment (cont.)

Determination for continuation of care

If upon completion of an initial nutrition assessment or reassessment it is determined that the problem cannot be modified by further nutrition care, discharge or discontinuation from this episode of nutrition care may be appropriate.


References


The purpose of nutrition screening is to identify individuals at risk for nutrition problems who will benefit from a more complete assessment and development of a nutrition care plan via the Nutrition Care Process (NCP).\(^1\) Although not part of the NCP, screening is nevertheless important to the process because it identifies clients who would benefit from nutrition care or medical nutrition therapy. Within the pediatric population, use of a standard screening tool was shown to improve compliance with measurement of anthropometrics on admission to the hospital.\(^2\)

Certain characteristics should be taken into consideration when developing and conducting a nutrition risk screen. Screening should be cost-effective, involve minimal risk for the person being screened, use readily available data, and use the fewest resources necessary
to accomplish the goal. Effective screening must also be accurate, which is defined by:

- sensitivity—the ability to identify all those at risk;
- specificity—the ability to identify all those not at risk; and
- positive and negative predictive value—that is, a high likelihood that a subject who is identified as “at risk” actually is at risk and a low likelihood that a subject who is not identified as at risk truly is at risk.3

Finally, screening is effective only if it can lead to interventions that increase the likelihood of positive health outcomes.

**Screening Parameters and Assignment of Risk**

Screening for nutrition risk involves the comparison of a set of parameters, such as anthropometric indicators, dietary intake, or biochemical data, against standards that identify nutrition risk. Five key areas for assessment when identifying pediatric malnutrition were defined by Mehta and colleagues in a landmark article published in 2013.4 The five domains include the following: anthropometric variables, growth, chronicity of malnutrition, etiology of malnutrition and etiology of pathogenesis, and impact of malnutrition on functional status.
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