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POCKET GUIDE TO

Pediatric Nutrition Assessment

THIRD EDITION

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Frequently Used Terms/Abbreviations

AAP	American Academy of Pediatrics
AI	adequate intake
AMA	American Medical Association
ASPEN	American Society for Parenteral and Enteral Nutrition
BMI	body mass index
BMR	basal metabolic rate
CDC	Centers for Disease Control and Prevention
CPE	Continuing Professional Education
DRI	Dietary Reference Intake
EAR	Estimated Average Requirement
EER	Estimated Energy Requirement

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

PeDiSMART	Pediatric Digital Scaled Malnutrition Risk Screening Tool
PNST	Pediatric Nutrition Screening Tool
PYMS	Paediatric Yorkhill Malnutrition Score
RDA	Recommended Dietary Allowance
REE	Resting Energy Expenditure
RQ	respiratory quotient
SAM	severe acute malnutrition
SAS	Statistical Analysis System
SDs	standard deviations
SGNA	Subjective Global Nutritional Assessment
STAMP	Screening Tool for the Assessment of Malnutrition in Paediatrics
STRONGkids	Screening Tool for Risk on Nutritional Status and Growth
TEE	total energy expenditure
TIBC	total iron-binding capacity
TSF	triceps skinfold

UL	Tolerable Upper Intake Level
UNICEF	United Nations Children's Fund
USDA	US Department of Agriculture
WHO	World Health Organization
WIC	Women, Infants, and Children

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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.

Adapted with permission from Swan WI, Vivanti A, Hakel-Smith NA, et al. Nutrition Care Process and Model Update: toward realizing people-centered care and outcomes management. *J Acad Nutr Diet.* 2017;117(12):2003-2014.[1]

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CHAPTER 2

Nutrition Risk Screening

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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