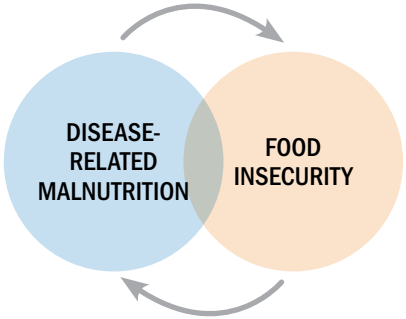
The Interaction of Pediatric Disease-Related Malnutrition and Food Insecurity: What the Clinician Needs to Know

PRACTICE TOOL

Inadequate nutrient intake in children can lead to impaired growth and delayed developmental milestones. Pediatric undernutrition can occur due to several factors, including disease-related malnutrition and food insecurity.

This practice tool's purpose is to assist the hospital-based clinician in identifying this potential multifactorial condition, intervening to treat it, and assisting in the transition from the acute care setting back to the community.



DISEASE-RELATED MALNUTRITION: A complex syndrome resulting from inadequate intake of nutrients that does not fulfil the patient's physiological requirement and from the disease-related systemic inflammatory response.[1] It can be associated with a patient's acute and/or chronic conditions and their treatments.[2]

PEDIATRIC MALNUTRITION: 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.[3]

FOOD INSECURITY: The lack of consistent access to adequate food and is an economic and social problem that can lead to hunger (a physiological condition) if it is severe or prolonged.[4] Household food insecurity affected 17.9% (6.5 million) of households with children in 2023. In some of these food-insecure households, only adults experience economic food insecurity, while in others, children also face it.[5] Black and Latino children are nearly twice as likely to experience hunger. Many families, regardless of race, struggle to afford food. However, it occurs more frequently among families of color because of discrimination rooted in historical housing inequalities, racism, health disparities, and the food system, among other factors. Single-parent families are more likely to experience hunger.[6] Food insecurity impacts health outcomes such as an increased risk of chronic conditions like obesity, heart disease, diabetes, and high blood pressure. It can also be associated with nutrient deficiencies, impaired immune function, depression, anxiety, and stress. Food insecurity is not always about lacking food; it can also mean a shortage of high-quality food. This can lead to overconsumption of cheap, accessible foods, resulting in obesity and micronutrient deficiencies.[7]

Prevalence of Pediatric Malnutrition in the U.S.

In hospitalized pediatric patients, studies using the National Inpatient Sample from the Healthcare Cost and Utilization Project have examined the rates of coded pediatric malnutrition. These reported rates vary depending on the specific ICD-10 codes applied, but it is generally recognized that malnutrition is often underreported and underdiagnosed. For example, in 2018, the documented rate of malnutrition among hospitalized patients was 8.3%. This rate increased to 16% among those who were later readmitted.[8] Similarly, data from another study showed that the malnutrition rate was 6.4% in 2019, up from 3.9% in 2012.[9] Additionally, a survey of hospital clinicians reported that 27% of children who screened positive for nutritional risk were ultimately identified as malnourished.[10]

Impact of Malnutrition on Health Outcomes

Pediatric malnutrition, despite the cause, can lead to impaired growth and delay in developmental milestones. In hospitalized children, it is associated with higher rates of infection, poor wound healing, longer lengths of stay, and increased cost.[3,11] See figure on the next page. More recently, in children who underwent heart surgery, it was found that being underweight was the strongest predictor of adverse outcomes.[12] In a study looking at nutritional status, social determinants of health and clinical outcomes in critically ill children, it was found that malnourished critically ill children who were disproportionately non-Hispanic Black, Hispanic, and Asian had worse hospital outcomes, including longer length of stay and PICU stay, increased time on mechanical ventilation, and higher risk of mortality.[13]

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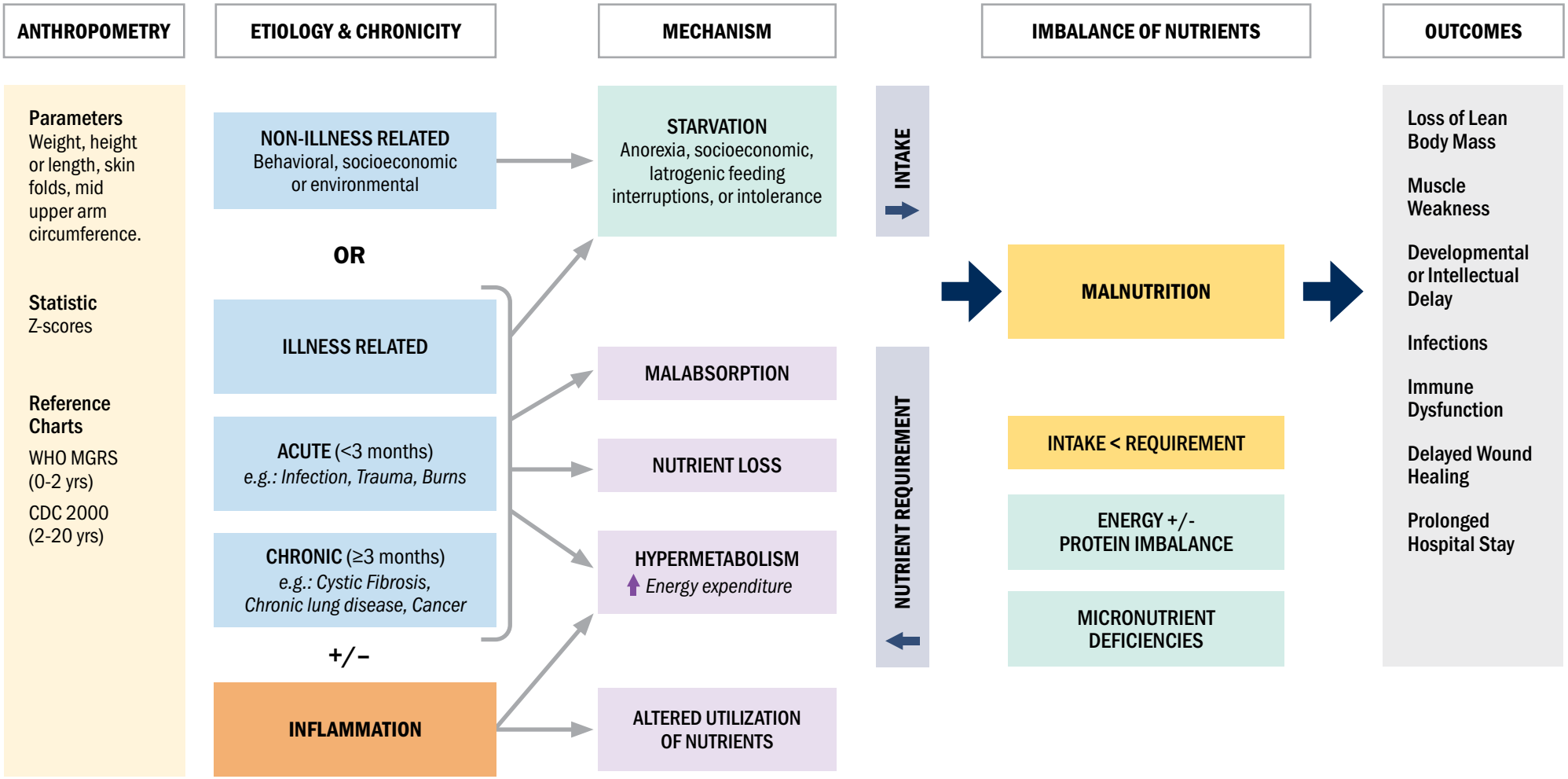
Defining Malnutrition in Hospitalized Children: Key Concepts

CDC, Centers for Disease Control and Prevention; MGRS, Multicenter Growth Reference Study; WHO, World Health Organization



Reprinted from Mehta NM, Corkins MR, Lyman B, et al. Defining pediatric malnutrition a paradigm shift toward etiology-related definitions. *JPEN J Parenter Enteral Nutr.* 2013;37(4):460-481.

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Nutrition Screening and Assessment for Children

This screening should include examining for both disease-related malnutrition and food insecurity. Organizations and providers should perform nutrition screening at hospital admission to detect children at higher risk of nutrition deterioration during the illness course.[3] Suggested screening tools for malnutrition include: Pediatric Nutrition Screening Tool (PNST); Screening Tool for Risk on Nutritional Status and Growth (STRONGkids), Screening Tool for the Assessment of Malnutrition in Pediatrics (STAMP); among others.[14]

Screening for food insecurity should be part of the overall screening process and can be done using the Hunger Vital Sign 2 question survey.[15] The Hunger Vital Sign™ identifies households as being at risk for food insecurity if they answer that either or both of the following two statements is 'often true' or 'sometimes true' (vs. 'never true'):

- "Within the past 12 months we worried whether our food would run out before we got money to buy more."
- "Within the past 12 months the food we bought just didn't last and we didn't have money to get more."

Once either of these conditions screen positive, intervention is needed. A child should go through a more elaborate nutrition assessment generally conducted by a dietitian which would include a combination of medical, nutrition, medication, and client histories; nutrition-focused physical examination (NFPE); anthropometric measurements; and biomedical data/medical diagnostic tests and procedures.[16] NFPE includes assessing: muscle, fat, and fluid assessment and micronutrient deficiency review.

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.[17]

- 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.

Case Study

A 7-year-old patient presents with abdominal pain, diarrhea, and weight loss. He is diagnosed with Crohn's disease and begun on anti-inflammatory medications and nutrition supplements after a nutrition screening tool showed he was a nutritional risk. As part of the overall assessment, the Hunger Vital Sign tool was given to the child's mother and the family screened positive for food insecurity as well. How should this child be nutritionally managed both inpatient and in the transition to the community?

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Overall Plan

The American Academy of Pediatrics (AAP) along with the Food Research & Action Center has developed a toolkit for pediatricians that is applicable to all healthcare clinicians called **SCREEN AND INTERVENE: A Toolkit for Pediatricians to Address Food Insecurity.**[18] The AAP has a full collection of food insecurity work at **aap.org/foodinsecurity.** The AAP Promoting Food Security for All Children policy statement[19] recommends:

SCREEN AND IDENTIFY children at risk for food insecurity;

CONNECT families to needed community resources; and

ADVOCATE with other key partners and stakeholders for federal, state, and local policies that support access to adequate and healthy food so that all children and their families can be nourished, active, and healthy.

Nutrition Intervention in the Hospital

- Provide a modified oral diet, oral nutrition supplements (ONS), or enteral nutrition (EN) as appropriate.
- Monitor nutrition assessment parameters such as growth, weight, and developmental milestones.
- Begin discharge planning early.

Transition to the Community

- Discharge planning: Consult case manager or social worker to address discharge needs and social services.
- Plan follow-up outpatient visits with healthcare team.
- Meet with family/caregivers to address medical, nutritional, and food insecurity issues.
- Provide information to family on social services available for food provision in the community.

Use and Examples of Food Programs

About 58% of food-insecure households participated in one or more of the three largest Federal nutrition assistance programs from the U.S. Department of Agriculture's Supplemental Nutrition Assistance Program (SNAP); the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); and the National School Lunch Program during the month before the 2023 survey.[5] See the American Academy of Pediatrics (AAP) along with the Food Research & Action Center **SCREEN AND INTERVENE: A Toolkit for Pediatricians to Address Food Insecurity** for multiple resources including federal nutrition programs available to assist families.

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