Pediatric Malnutrition: Frequently Asked Questions

Introduction:
These FAQs for Pediatric Malnutrition were generated in response to direct queries regarding translating to practice the 2014 Pediatric Malnutrition Consensus Statement published by the Academy of Nutrition and Dietetics and A.S.P.E.N as cited here: *J Acad Nutr Diet*. 2014;114(12): p1988–2000; *Nutr Clin Pract* February 2015 30: 11-13.

Disclaimer: The 2014 Pediatric Malnutrition (Undernutrition) Consensus Statement is not a definitive statement of the diagnostic indicators of pediatric malnutrition (undernutrition), but is a recommendation, based on an evidence informed, consensus derived process that represents a summary of expert opinion, to date, on this topic. The indicators and recommendations are subject to change as evidence from future research, related to this topic, is generated.

Suggested references are provided for those questions regarding general nutrition concepts included in the Pediatric Malnutrition Consensus Statement. It is hoped that the responses and references provided in these FAQs will assist you to implement these recommendations into your practice setting(s). It is expected that you will use clinical expertise and sound clinical judgment in translating the recommendations provided in the Consensus Statement into your unique practice environment.

For questions directly related to one or more of the published characteristics, a direct response will be provided. For other questions, such as how to measure a specific characteristic or additional information related to alternative assessment or intervention options, referral to peer reviewed literature will be provided. The individual voicing the inquiry then has the option to review examples of relevant literature and the choice to pursue the course of action that is the best fit for their specific practice situation.

1. **Please confirm for us the reference for percent of nutrient intake. We are interested to know where did the percent intakes come from to differentiate between mild, moderate, and severe. Also, what is the time frame of the decreased intake?**

   The adult consensus statement was one of the information sources considered (although not cited in the Pediatric Statement) and the World Health Organization publications (reference #22-25 and 45) cited in the Pediatric Statement. This is just one more grey area with consensus support vs. literature support. There is very little in the peer-reviewed literature that relates to the quantification of deficits in protein /calorie intake and correlation of a specific percentage of deficit to mild, moderate or severe malnutrition. No time frame(s) have been established for the occurrence of malnutrition in the face of a specific percent deficit. Poor nutrient intake that leads to malnutrition in children can happen in as quickly as 2-3 days in at risk populations. Once again, this is much more of an issue in "children at nutritional risk" as opposed to well-nourished children who do not have a disease(s) or other complicating condition(s).

2. **Why are there no time frames recommended for the Pediatric Malnutrition nutrition indicator for weight loss in children ages 2 to 20 years?**

Weight loss in children who are at risk for malnutrition / undernutrition is always an indicator of sub-optimal nutrient intake. There should never be weight loss in children at risk for malnutrition related to undernutrition. During any given time period growing children should be gaining weight and height until they reach their growth potential. Therefore weight loss of 5 percent of total body weight or greater is an indicator of pediatric malnutrition / undernutrition irrespective of time. Weight gain velocity in older children has a much longer time frame than that of younger children who are growing at a faster rate. That is why weight gain velocity was designated an indicator for children 0-24 months of age. For adolescents, who are also in a period of accelerated growth, inadequate weight gain could be used. This parameter was not identified as an "indicator" in the consensus statement as there is little to no literature to support the use of weight gain velocity as an indicator of malnutrition in the adolescent age group.

3. **The Consensus statement included deceleration of weight for length z score for children less than 2 years of age as an indicator of pediatric malnutrition / undernutrition. Can deceleration of BMI for age z scores for children 2 to 20 years of age also be used?**

Yes. Deceleration of BMI for age z score. The same criteria used for deceleration of weight for length z score should be used for this indicator.

Indicator	Mild malnutrition	Moderate malnutrition	Severe malnutrition
Deceleration in BMI for age Z score	Deceleration across 1 z score lines	Deceleration across 2 z score lines	Deceleration across 3 z score lines

4. **In the body of the paper, it is mentioned that the World Health Organization (WHO) defines stunting as HAz -2 SD or more below the norm for age (page 3). But in Table 3, only HAz -3 or below is used. Do you know why?**

The workgroup's expert opinion is that there was insufficient data to classify a height-for-age z score of -2 as "moderate" malnutrition, but the data supported defining severe malnutrition with ht-for-age of < -3 z score.

5. **The indicator length or height for age only denotes – 3 z score as an indicator of severe malnutrition. What is the reference for the indicator?**

The reference for this indicator is the *"WHO child growth standards: training course on child growth assessment. Interpreting Growth Indicators. Module C page 14. World Health Organization 2008."* It is derived from the WHO criteria for stunting and severe stunting. Chronic undernutrition or stunting being defined by the WHO as "having a height or length for age that is less than 2 standard deviations (z scores) of the median of the National Center for Health Statistics (NCHS) / WHO international reference. Severe stunting defined as "having a height or length for age that is less than 3 standard deviations (z scores) of the median of the NCHS / WHO international reference. The consensus statement only used the "severe" criteria as the other WHO definition for stunting did

not specify a level of acuity.

6. **Traditionally a downward "crossing of 2 growth channels" has been used to identify failure to thrive/malnutrition. How does that compare to the proposed deceleration in wt-for-length/height z score indicator?**

    Deceleration in wt-for-length/height z score is just one indicator available to assess malnutrition, when 2 or more data points are available. For infants, weight gain velocity or wt-for-length z score could be used instead if the clinician prefers (as these indicators would capture similar growth trends representative of malnutrition). For >2 years of age, BMI for age or weight loss could be used.

    Interestingly, a literature review revealed that the "crossing 2 growth percentiles" concept was not evidence based. Edwards and colleagues proposed a functional definition of failure to thrive as "a child whose weight deviates downwards across two or more major centiles from the maximum centile achieved at 4 to 8 weeks for a period of a month or more."[1]

    A comparison of the two concepts (deceleration in wt-for-length/height z score vs "crossing 2 growth percentiles") is described as follows: a drop in z-score from "0" to -2 is approximate to a decrease of 2 growth channels (e.g. 25-50%ile to 10-25th%ile, then to 5-10th%ile, then to 2-5th%ile).

Percentile-Z-Score Conversion Values

Percentile	Z-Score
0.2nd	-3
2.3rd	-2
2.5th	-1.96
5th	-1.64
15th	-1.04
16th	-1
50th (median)	0
84th	+1
85th	+1.04
95th	+1.64
97.5th	+1.96
97.7th	+2
99.8th	+3

Wang et. al, Handbook of Anthropometry, 2012

With kind permission from Springer Science+Business Media: Handbook of Anthropometry, Use of Percentiles and Z-Scores in Anthropometry, 2012, p 30, Youfa Wang and Hsin-Jen Chen, Table 2.1, Copyright©2012, Springer.

---

[1] Edwards A, Halse P, Parkin M, et al. Recognizing failure to thrive in early childhood. Arch Dis Child 1990;65:1263–5.

7. **Given the inaccuracies in anthropometric measurements, why is only one criteria required to identify pediatric malnutrition?**

The pediatric malnutrition work group chose not to require 2 or more indicators so as to facilitate early diagnosis of pediatric malnutrition. It is expected that accurately obtained anthropometric data will be utilized in the determination / identification of pediatric malnutrition. If you have concerns regarding the accuracy of the anthropometric data provided, please repeat the measurements. Misdiagnosis of malnutrition using inaccurate anthropometrics should not occur.

8. **Why were physical exam findings and the Subjective Global Assessment not included in the indicators for the identification of pediatric malnutrition?**

The Subjective Global Assessment (SGA) is a screening tool used to screen patients for nutrition risk. The purpose of the consensus statement was to propose objective standardized indicators that would identify pediatric malnutrition and allow for its documentation once a patient has been screened for nutritional risk. Some of the criteria on the SGA and those used for physical assessment are subjective. The members of the pediatric malnutrition work group chose to identify "objective" data as the indicators.

9. **When a child has indicators of more than one level of malnutrition acuity (mild, moderate and/or severe) which one should be selected?**

It is recommended that when a child meets more than one malnutrition acuity level, the provider should document the severity of the malnutrition at the highest acuity level to ensure that an appropriate treatment plan and appropriate intervention, monitoring and evaluation are provided.

10. **What about patients who are admitted healthy but over the course of their admission become malnourished due to treatment (such as bone marrow transplant) or due to the sequelae of their condition (such as with preterm birth)?**

The consensus statement was developed to address the assessment of children ages 1 month to 18 years. Thus, the indicators identified do not necessarily apply to the identification of malnutrition in neonates and preterm infants.

It is important to diagnose malnutrition as soon as it is recognized and to thoroughly document the indicators that led to its identification. Contributors to malnutrition's occurrence/its etiology should also be thoroughly documented, if known. A treatment plan should be developed and implemented. Routine monitoring, evaluation and revision of the plan, as indicated, should also be noted.

If/when a child is likely to be at increased risk for malnutrition due to preterm birth, a congenital condition, treatment for a disease/condition, a detailed plan to prevent, if possible, or to minimize malnutrition's occurrence/progression should also be documented. Strategies to monitor and evaluate the efficacy of the plan and revisions made when indicated should be provided.

The "present on admission" standard used for Medicare payments does not apply to malnutrition. The payment system for hospital admissions under the Medicaid program varies from state to

state. States are able to design their own payment systems for Medicaid, and may do so following Medicare models. Some states have designed payment systems that factor in complications/co-morbidities similar to the MS-DRG system used by Medicare, while others do not. Whether or not documenting and treating malnutrition in pediatric patients results in enhanced payments depends on the individual state's Medicaid program and payment system.[2,3]

11. Can these same criteria be applied to all children? Including children with chromosomal abnormalities or other syndromes?

Growth curves do not exist for all syndromes or conditions. Even fewer of these are found on our electronic record systems. The majority of these patients end up with parameters, including z-scores, calculated from the "normal" curves. Anyone who takes care of these children knows that their parameters will be less than the average child's. In fact, their condition is often part of their malnutrition diagnosis. However, they are still children and expected to grow. Their parameters should not be static or decreasing. If this is occurring; then the patient is experiencing malnutrition. This is why the criteria include some "two data points" parameters. Malnutrition must be addressed immediately regardless of cause.

12. How can I obtain permission to reprint information in the consensus statement?

Information on how to use content from the consensus statement published in **the Journal of the Academy of Nutrition and Dietetics** can be found at http://www.elsevier.com/about/open-access or through the Academy: under "Reprints Information" at http://www.andjrnl.og/content/contact - Derrick Imasa - Elsevier Inc. 1-212-633-3874 or at reprints@elsevier.com

Information on how to use content from the consensus statement published in **Nutrition in Clinical Practice** contact permissions@sagepub.com.   Print copies of individual issues can be purchased by contacting the SAGE Journals Customer Service department journals@sagepub.com 1-800-818-7243.

13. How do we get physician/provider buy in?

Physicians/providers are trained to be diagnosticians.   They are fact and study driven by nature. Therefore, a publication goes a long way.   This publication and the original definition paper are based on literature work that was exhaustive. Therefore, the start of the process is to let them "examine" the evidence themselves by giving them the publications. Next, physicians/providers are creatures of habit. To be successful, they have developed approaches that have been successful in the past. To change the habit requires lots of persistent exposure.   They need enough exposures to z-scores to realize how valuable they are. When the patient fits the criteria for malnutrition they

---

[2] Kevin Quinn. New Directions in Medicaid Payment for Hospital Care *Health Affairs*, 27, no.1 (2008):269-280.

[3] Department of Health and Human Services. CMS Medicare Learning Network. POA Factsheet: Hospital Acquired Conditions and Present on Admission Indicator Reporting Provision. September 2014, ICN 901046.

need to be told the patient meets the criteria and is malnourished. When it happens with enough frequency, it will move from new to the standard of care.

FAQs for Adult Malnutrition can be found at: (*J Acad Nutr Diet.* 2012;112(5):730-738; www.eatrightpro.org/resource/practice/getting-paid/nuts-and-bolts-of-getting-paid/malnutrition-codes-characteristics-and-sentinel-markers or *JPEN J Parenter Enteral Nutr.*2012;36(3):275-283. https://www.nutritioncare.org/Guidelines_and_Clinical_Resources/Toolkits/Malnutrition_Toolkit/Related_Publications/)