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Clinical Practice Guideline for Diagnosis and Management of Faltering Weight

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abstract

This evidence-based guideline from the American Academy of Pediatrics and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition is intended to support health care providers who care for children with poor weight gain. This clinical practice guideline (CPG) panel updates the term "failure to thrive" to "faltering weight" and using *z* score cutoffs rather than percentiles as diagnostic criteria. A diagnosis of faltering weight includes any of the following: (1) weight-for-length or body mass index (BMI)-for-age less than −1.65 *z* score (5th percentile); (2) in children younger than 2 years, weight gain velocity less than −2 *z* score for age (2.3rd percentile); or (3) decline in weight, weight-for-length, or BMI greater than or equal to 1 *z* score. This definition was formulated by the guideline panel through an iterative process of discussion and voting to reach consensus. The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach was used to formulate recommendations and good practice statements, including GRADE Evidence-to-Decision frameworks, which were reviewed by internal and external contributors. The CPG provides 8 Key Action Statements (recommendations) and articulates 4 Good Practice Statements for additional guidance. Diagnostic testing is only recommended for children who have specific conditions that suggest a focal evaluation or persistent faltering weight. In children with persistent faltering weight or who have concerns for conditions that cannot be diagnosed without endoscopy, the CPG suggests endoscopy with biopsy. The CPG recommends the use of increased calories of food/energy; oral nutritional supplementation; and therapy for pediatric feeding disorder. When implemented, the CPG is intended to reduce confusion about

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diagnostic criteria and improve diagnostic accuracy, decrease overutilization of laboratory testing and imaging in children with faltering weight, and enhance health care utilization.

INTRODUCTION

Failure to thrive (FTT) is a common reason for pediatric clinic visits and hospital admission, occurring in approximately 5% to 10% of children in primary care settings and 3% to 5% of those in the referral setting.[4] Yet, the term is primarily descriptive, as FTT results from an underlying process or processes. FTT has no precise definition, the standards of care are unclear, and the term has negative connotations for many parents and other caregivers.

Historically, the definition of FTT has included growth deceleration or arrest and division into 2 categories: organic, marked by an underlying medical condition, or nonorganic/psychosocial, for instances in which no medical condition is found. This approach, however, is too inflexible for patient management because of the complex interactions between a child's medical, nutritional, and social issues that contribute to inadequate nutrition and growth.[5,6]

The criteria in this clinical practice guideline (CPG) advance the objective to address the lack of precise definition, standards of care, and evidence-based guidelines. It has 4 overarching areas of content.

First, this CPG proposes replacing "failure to thrive" with a new term, "faltering weight." The new term was decided on by an iterative process; the term "faltering" aligns with the 2017 National Institute for Health and Care Excellence (NICE) guidelines.[7]

Second, this CPG suggests various criteria that can be used to diagnose faltering weight in a child. This effort aligns with the objective to standardize the definition, reliably diagnose faltering weight in children, and use information that is available in most electronic health records (EHRs). As a result, this CPG's diagnostic criteria propose *z* score cutoffs, transitioning from the current percentile-based diagnostic criteria.

Third, this CPG provides an approach to patient evaluation, ranging from laboratory tests that can be ordered by the pediatrician to procedures that require specialist intervention—such as endoscopy. Given that not all children with faltering weight have an "organic" condition, diagnosing faltering weight in a child should be considered the first step toward determining whether the child has malnutrition, needs increased energy provision, and/or requires further testing.

Fourth, this CPG provides 8 management recommendations, or Key Action Statements (KASs), to aid the pediatric clinician. In addition, 4 Good Practice Statements are articulated to further guide pediatric clinicians who care for children with potential faltering weight. This CPG also provides implementation support and suggests directions for future research.

The CPG is designed for pediatricians and other pediatric health care providers (PHCPs) who see children in the outpatient setting who have problems meeting growth expectations and goals. The term "pediatricians and other pediatric health care providers" includes primary care pediatricians, family practice physicians, subspecialty physicians, other specialty physicians (eg, gastroenterology, genetics), and other members of the team who care for children with faltering weight (eg, dentists, dietitians, feeding therapists, lactation consultants, nurses, nurse practitioners, nutritionists, oral surgeons, physician assistants, social workers, speech and occupational therapists, behavioral and/or functional therapists, feeding therapists, and pediatric psychologists).

Faltering weight is a multifactorial diagnosis that necessitates a systematic application of evidence and a multidisciplinary team-based approach. Most cases can be managed by addressing key elements of the patient's history and physical examination. Once implemented, the "Clinical Practice Guideline for Diagnosis and Management of Faltering Weight" is intended to remove confusion about diagnostic criteria, increase reliability in the diagnosis of faltering weight, improve workups and diagnosis to make health care utilization more efficient and productive, and decrease overutilization of laboratory testing and imaging in children with faltering weight.

TABLE 1. Select Clinical Guidance from the CPG

1. The definition of faltering weight includes any of the following:
   - Weight-for-length, or BMI-for-age <-1.65 *z* score (5th percentile); or
   - In children aged <2 years, weight gain velocity <-2 *z* score for age (2.3rd percentile); or
   - Decline in weight, weight-for-length, or BMI ≥ 1 *z* score.
2. Accurate anthropometric measurements are essential to monitor growth both in all children and in the diagnosis of faltering weight.
3. The Guideline Panel does not recommend endoscopy in the initial workup of children with faltering weight. Endoscopy with biopsy may be considered, however, in children who have persistent faltering weight or for whom there are concerns for conditions that cannot be diagnosed without endoscopy.
4. In children without specific signs, symptoms, and findings that would prompt a focal evaluation, the Guideline Panel recommends against diagnostic testing as part of the initial routine workup for faltering weight.
5. The Guideline Panel recommends against using socioeconomic status as an assigned risk factor when diagnosing faltering weight.
6. In children who have faltering weight, the Guideline Panel recommends the use of increased calories in the form of oral nutritional supplementation.
7. In children who have faltering weight and documented feeding issues, the Guideline Panel recommends therapy for pediatric feeding disorder.

Key Action Statements (KASs)			
Clinical Question	**KAS**	**Remark**	**Good Practice Statement**
Clinical Question 1. Should socioeconomic status (SES) be used as a risk factor for children with faltering weight, or not?	KAS 1: The AAP Guideline Panel suggests against using SES as an assigned risk factor when diagnosing faltering weight. (Conditional recommendation, very low certainty of evidence.)	Clinicians are encouraged to conduct surveillance for risk factors that are related to social drivers of health during all patient encounters, because these might be predictive of access to recommended therapies and for appropriate referral to support programs such as community organizations and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), etc.	The AAP Guideline Panel emphasizes the importance of social support programs to mitigate the harmful impacts of poverty and other social drivers of health, including food insecurity.
Clinical Question 2. Should diagnostic tests be used to screen for underlying conditions for children with faltering weight?	KAS 2A: In children who have certain conditions that suggest a focal evaluation (ie, severity of malnutrition, time since diagnosis, family history, additional signs or symptoms) or have persistent faltering weight, the AAP Guideline Panel suggests diagnostic testing rather than no testing. (Conditional recommendation, very low certainty of evidence.)		During the initial evaluation of faltering weight or suspected faltering weight, the AAP Guideline Panel recommends that all children receive a thorough history, physical examination, and developmental evaluation (eg, oral-motor, fine motor skills); family and social history; medical and surgical history; and an assessment of growth, feeding history, and other difficulties and concerns (cultural norms, parental feeding practices, breastfeeding history, etc).
	KAS 2B: In children without specified conditions that suggest a focal evaluation, the AAP Guideline Panel recommends against diagnostic testing as part of the initial routine workup for faltering weight. (Strong recommendation, very low certainty of evidence.)	Diagnostic tests as part of the initial workup had very low certainty with trivial benefit and could result in moderate harm, high costs, reduced health equity, and issues with accessibility and feasibility, warranting a strong recommendation against its use. (Second paradigmatic situation from GRADE guidance.[1,2])	
			Accurate anthropometric measurements are essential to monitor growth in all children and in the diagnosis of faltering weight. Recumbent length measurement is recommended for all children younger than 2 y (birth to 23 mos) using an infantometer with a fixed head piece, horizontal backboard, and an adjustable foot piece, when possible. (Some practices use other methods, as needed.) Standing height should be obtained on all children 2 y and older who are able to stand unassisted using a stadiometer with a fixed vertical backboard and an adjustable head piece. For children who cannot stand, PHCPs are encouraged to follow best practice for children with special health care needs. Weight should ideally be obtained using a digital weight scale, without clothes for infants younger than 2 y, and in only light clothing and without shoes for children 2 y and older. For further details on these measurements, see the CDC's *National Health and Nutrition Examination Survey (NHANES): Anthropometry Procedures Manual*.[3]

(Continued on next page)

Key Action Statements (KASs) (Continued)			
Clinical Question	**KAS**	**Remark**	**Good Practice Statement**
Clinical Question 3. Should endoscopy be used for children with faltering weight, or not?	KAS 3A: In children with faltering weight, the AAP Guideline Panel recommends against endoscopy as part of the initial routine workup. (Strong recommendation, very low certainty of evidence.)	Endoscopy as part of the diagnostic workup had very low certainty of trivial benefit (eg, inconclusive results, of little benefit) but could result in moderate harm (procedural complications), high costs, and reduced health equity (including accessibility and feasibility); hence, a strong recommendation is made against its use as part of the initial, routine workup. (Second paradigmatic situation from GRADE guidance.)[1,2]	When referral to a gastroenterologist is needed for faltering weight, the AAP Guideline Panel recommends referral to a pediatric gastroenterologist who can critically assess the need for endoscopy and, when endoscopy is indicated, obtain the necessary biopsy specimens in addition to performing the requisite endoscopy.
	KAS 3B: In children with persistent faltering weight or who have concerns for conditions that cannot be diagnosed without endoscopy, the AAP Guideline Panel suggests endoscopy with biopsy rather than no endoscopy. (Conditional recommendation, very low certainty of evidence.)		
Clinical Question 4. Should increased calories of food/energy be used for children with faltering weight, or not?	KAS 4: In children with faltering weight, the AAP Guideline Panel recommends the use of increased calories of food/energy rather than no increased calories of food/energy. (Strong recommendation, very low certainty of evidence.)	Increased calories of food/energy may result in large benefits and increased health equity with the possibility of small harms (ie, excessive weight gain, added stress, force-feeding), warranting a strong recommendation for the intervention. (Third paradigmatic situation from GRADE guidance.)[1,2]	
Clinical Question 5. Should oral supplements/higher-energy formulas be used for children with faltering weight, or not?	KAS 5: In children with faltering weight, the AAP Guideline Panel suggests the use of oral nutritional supplementation rather than no oral nutritional supplementation. (Conditional recommendation, very low certainty of evidence.)	Use of higher-calorie formulas/ human milk supplementation for infants or oral nutritional supplements for children older than 12 mos may support improved weight gain. However, some families may lack access to these resources (eg, high costs, geographic location, lack of insurance coverage or WIC). Additionally, outcomes could include excessive weight gain, reduced intake of foods at mealtimes, and eventual product burnout. These risks warrant a conditional recommendation for the intervention. When formula is used to increase the energy density of human milk or used as supplement, this should be done with minimal disruption to lactation whenever possible.	
Clinical Question 6. Should therapy for pediatric feeding disorder be used for children with faltering weight who have documented feeding difficulties, or not?	KAS 6: In children with faltering weight who have documented feeding issues, the AAP Guideline Panel suggests therapy for pediatric feeding disorder rather than no therapy for pediatric feeding disorder. (Conditional recommendation, very low certainty of evidence.)		

A brief summary of select clinical guidance from this CPG is provided in Table 1. Please see the Key Action Statements (KASs) table for complete KASs and essential accompanying remarks and good practice statements.

DEFINITION OF FALTERING WEIGHT

Background

The term "failure to thrive" has been in use since the 1930s and has always been more of a descriptive term than a true diagnosis. It originated in order to describe children in resource-abundant nations who had weight and growth concerns but who did not have the overt malnutrition commonly seen in children in resource-limited countries.

Concerns about undernutrition and malnutrition in children with FTT persist. Unfortunately, there has never been consensus on the definition for FTT. Weight (eg, weight-for-age percentiles) has always been central to the diagnosis and, therefore, definition of FTT. Using growth charts (predominantly those from the World Health Organization [WHO] and the Centers for Disease Control and Prevention [CDC]) to plot and track weight has also been important for FTT. Additional anthropometric factors have also been used, such as length/height for age, weight for length/height, and body mass index (BMI). Alternate criteria have emerged, such as absolute mid-upper arm circumference less than 12.5 cm in children younger than 5 years; a child who experiences a slower-than-expected rate of growth; a child who is less than the third or fifth percentile for weight-for-age; a child who falls 2 major percentile lines on a weight-for-age growth chart; or a child for whom the weight-for-age decelerates/crosses 2 major percentile channels on the appropriate disease- and sex-specific growth chart.[8,9]

Despite different trends over time and the ongoing popularity and use of percentile growth charts, no consistent description of FTT has emerged. The lack of a unified definition leads to both under- and overdiagnosis of the condition. Additionally, research in this area is difficult because of the wide variability of criteria.

Further complicating the history of FTT is the previously used classification system of "organic FTT" vs "nonorganic FTT." Organic FTT has been used to attribute the condition to acute or chronic medical conditions such as sepsis or cystic fibrosis. Nonorganic FTT has been used to attribute the condition to other factors, such as social or environmental influences, generally after other organic causes have been ruled out. Often, however, FTT cannot be classified as clearly being attributable to organic vs nonorganic causes. Hence, that classification system was not helpful for patients and was an overly simplistic way to think about this complex condition. Therefore, this classification system is no longer promoted.

The term FTT has also been fraught with controversy that has contributed to the difficulty in determining the criteria used to define it. The word "failure" has led caregivers to feel blamed for their child's condition. The term has also been inconsistently applied, which may exacerbate existing health care inequities.

When all of these factors are considered—the lack of consensus on definition, the negative connotation associated with the word "failure," the term's lack of specificity, and the way the term has been used to further inequities—it is clear that it is time to move past this language. PHPCs have begun to use other terms, like "faltering growth" or "mild malnutrition," to describe this condition because of their concerns about the label of FTT.

Development Approach and Methods

The CPG Guideline Panel worked intentionally to determine both a new name and definition for failure to thrive that would be more sensitive and less stigmatizing toward patients, parents, and caregivers. Using a modified Delphi process involving iterative surveys of the panel and discussion of the results to arrive at consensus, the members developed a revised term, "faltering weight," to describe the condition and a set of characteristics that compose its definition. This process occurred in parallel to and independently of the development of KASs based on systematic evidence reviews. (It should be noted that all of the research that guides the CPG's subsequent recommendations used the term "faltering weight" originally; therefore, that term is used when describing the research on which the CPG's recommendations are based.) Before disseminating any materials for voting, the panel established a threshold of 80% agreement required for any element to be incorporated into the definition. Terms and criteria were circulated for voting until consensus was achieved or until the panel determined through discussion that consensus was not possible.

Proposed Definition

The Guideline Panel considered many prior definitions for this condition. Members discussed updating the definition with regard to *z* scores and providing the corresponding percentiles (when available) to enable the use of these parameters in the absence of an EHR. The Guideline Panel agreed that the goal for the CPG was to function as a screening tool for the early detection of undernutrition on the basis of the view that early intervention is likely to minimize or avoid the sequelae of significant malnutrition.

The Guideline Panel also decided to attempt to use *z* scores (vs percentiles) when possible. Anthropometric *z* scores (as opposed to percentiles) are the global standard for assessing and reporting nutrition status. A *z* score is a statistical measurement of the distance from the mean, where the median *z* score of 0 is the 50th percentile, and −2 *z* score is the 2.3rd percentile on a growth chart. *Z* scores

are available for all standard anthropometric measurements, which allow for a more precise description of anthropometric data than percentiles. *Z* scores do not have lower or upper limits; hence, a child below the first percentile has a specific *z* score (−3.23, for example) that more accurately represents the child's measurement than the term "below the 1st percentile." *Z* scores are particularly useful when measurements are below the first percentile and to describe changes in various anthropometric measurements. (Please see the Implementation Toolkit [https://www.aap.org/en/patient-care/clinical-practice-guidelines-for-diagnosis-and-management-of-faltering-weight/] for more details.)

Z scores also allow for precise descriptions of changes in growth trajectory at extremes of the growth chart (ie, a child whose *z* score changes from −4 to −3.5 over time in percentiles would be below the first percentile at both time points). In addition, when a child shows a change in an anthropometric measurement, a change in 1 *z* score reflects the same degree of change irrespective of the starting *z* score. This factor is not true of percentiles; a drop of 10 percentiles reflects different degrees of decline depending on the starting point. Finally, scores can be used to compare populations regarding growth.

Hence, these definitions of faltering weight are concerned with underlying anthropometric measurements and include any of the following:

- Weight-for-length, or BMI-for-age less than −1.65 *z* score (fifth percentile); or
- In children younger than 2 years, weight gain velocity less than −2 *z* score for age (2.3rd percentile); or
- Decline in weight, weight-for-length, or BMI greater than or equal to 1 *z* score.

For these definitions, as per standard recommendations, weight-for-length *z* score pertains to children younger than 2 years, whereas BMI *z* score pertains to children 2 years or older; corrections should be made, as appropriate, for prematurity. It should be noted that not all children who fulfill these criteria will have undernutrition. The dynamic nature of growth, especially in the first 2 years of life, makes it impossible to generate criteria that include all underweight children and effectively exclude children who are well nourished. For instance, children who are born large for their gestational age will exhibit early declines in anthropometric *z* scores and may meet the above criteria but should not necessarily be considered to be malnourished. There are also data that children born with anthropometric measurement *z* scores greater than 0 (ie, >50th percentile) are much more likely to exhibit such declines in *z* scores during the first 2 years of life.[10]

In addition, some children who are born small for their gestational age may meet the faltering weight *z* score threshold for weight-for-length/BMI *z* score—but may not be undernourished. Similarly, children with genetic conditions may have different growth potentials and may grow differently. In addition, preschool children who are overweight and have shown declines in *z* scores because of active intervention to reduce them would not be considered to have faltering weight. The Appendices include tables for weight gain velocity less than −2 *z* score (2.3rd percentile) for age for the first 2 years of life (see Appendix A, Table 2, and Appendix A, Table 4).

The *z* score cutoff of less than −1.65 was chosen as a mechanism to screen children for faltering weight. Other authorities have chosen lower cutoffs to delineate faltering weight, however, so some children who fall below this cutoff may not actually be undernourished.[11]

Children who meet the criteria for faltering weight will have weight gain velocity that is lower than these values. These weight-gain velocity standards are available from the WHO at intervals of 1 month (up to 12 months of age), 2 months, 3 months, 4 months, and 6 months. In some instances, the −2 *z* score is a negative value. In these cases, the −1 *z* score value is provided. For the first 2 months of life, weight gain norms at shorter intervals are available in a separate table (see Appendix A, Table 1, and Appendix A, Table 3). For these tables, the fifth percentile of weight gain is provided, because the −2 *z* score is not available.

The Guideline Panel deliberately chose to exclude height measurements in isolation from the definition, as it considered these cutoffs as a means of identifying early undernutrition. Children who screen positive should also be assessed for malnutrition using other accepted definitions. Children with decrements in length or height attributable to nutritional reasons have likely had longstanding malnutrition; early diagnosis and intervention of faltering weight should prevent these decrements.

The cutoffs for weight-for-length/BMI *z* score and the criterion for poor weight gain were unanimously approved by the Guideline Panel. The voting for the decline in weight, weight-for-length, or BMI *z* score did not meet the 80% threshold set a priori by the Guideline Panel. The 1.0 *z* score threshold for decline in these scores was voted on by 78.5% of Guideline Panel members, with the rest of the members voting for a decline of 0.7 scores as the cutoff. The 1.0 *z* score threshold for decline in these scores has been recommended by other authorities.[12]

The results reflect the difficulty in selecting a single *z* score drop for these parameters. A 0.7 score drop reflects a drop of 1 major percentile line per the traditional CDC growth charts (where the major percentile lines are the 3rd, 10th, 25th, 50th, 75th, 90th, and 97th). A 1 *z* score change reflects a major percentile line drop on the WHO growth charts where the major percentile lines are actually also *z* scores (2.3rd percentile [−2 *z* score], 15th percentile [−1 *z* score], 50th percentile [0 *z* score], 85th percentile [+1

TABLE 2. Rough Drop in Percentiles After a 1 *z* Score Decline in Any Anthropometric Measurement

Initial Percentile	Percentile After a 1 *z* Score Decline
97th percentile	~80th percentile
95th percentile	~75th percentile
90th percentile	~60th percentile
75th percentile	~35th percentile
50th percentile	~15th percentile
25th percentile	~5th percentile
10th percentile	<1st percentile

Note: The percentiles after the decline are rounded figures and are approximate. In addition, the 1 z score drops at the higher percentiles should be interpreted as faltering weight with some caution.

z score], and 97.7th percentile [+2 *z* score]) (see Table 2). Please note that these are approximate values.

Although the articles that were analyzed to answer the population, intervention, comparator, and outcome (PICO) questions did not include tube-fed children, the Guideline Panel believes that the same criteria can be used to diagnose faltering weight in tube-fed children, although the methods to address the faltering weight may be different.

Conclusion

This updated definition of faltering weight is intended to provide standardized criteria and updated terminology to advance the care of children experiencing undernutrition. Additionally, the definition may be applied in research settings to facilitate consistency within and across studies. Future research may evaluate the impact of applying the new definition in practice.

DEVELOPMENT OF KEY ACTION STATEMENTS

Methodology

Separately and in parallel to the development of a new term and definition of faltering weight, the Guideline Panel developed KASs, or recommendations, following the GRADE approach (for information on GRADE, see https://aap.org/thegradeapproach, gradeworkinggroup.org).[13–15] The overall guideline-development process—including funding of the work, panel formation, management of conflicts of interest, internal and external review, and organizational approval—was guided by American Academy of Pediatrics (AAP) policies and procedures. The process is intended to meet the National Academies of Medicine (formerly the Institute of Medicine) and the Guidelines International Network recommendations for trustworthy guidelines.[16–19]

Guideline Panel Composition, Process, and Support

Panel Formation and Management of Conflicts of Interest

The AAP established a formalized process for receiving and vetting proposals from multiple vendors to streamline the systematic review of evidence for this CPG. Once the vendor selection process was completed, the Evidence Foundation was appointed as the contracted consultant organization to be responsible for conducting the evidence review for the de novo guidelines. The Evidence Foundation is a nonprofit organization that is distinguished by its founders who actively lead and facilitate GRADE Working Group workshops nationwide, focusing on evidence-based CPGs and systematic reviews.

The AAP engaged the expertise of diverse and accomplished Guideline Panel members to facilitate the CPG's development. The Panel members included a chair, vice chair, informatician, epidemiologist, implementation scientist, social worker, parent/caregiver liaison, psychologist, dietitian, endocrinologist, pediatric hospitalist, general pediatricians, pediatric geneticist, and several gastroenterologists through a collaborative partnership with the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN). This dedicated Guideline Panel worked from 2021 to 2024 and participated in orientation calls, an in-person meeting, and monthly conference calls during which they reviewed evidence following the Evidence Foundation's systematic review.

Each member of the Guideline Panel submitted an online conflict of interest form, ensuring transparency and integrity throughout the process.[20] Potential conflicts were reviewed and resolved by the AAP's Conflict of Interest Management Advisory Committee using a process that has been approved by the Board of Directors. The AAP has neither solicited nor accepted any commercial involvement in the development of the content of this publication. All CPGs are funded by the AAP.

Internal and External Review

For transparency, internal and external peer reviewer groups and organizations were invited to provide comment on the CPG as well as the 2 corresponding technical reports (TRs).[21,22] Comments were accepted for a period of 30 days.

The following AAP committees were invited to participate in the peer review process: the Committee on Child Health Financing; Committee on Hospital Care; Committee on Infectious Diseases; Committee on Medical Liability and Risk Management; Committee on Native American Child Health; Committee on Nutrition; Committee on Pediatric Emergency Medicine; and Committee on Practice and Ambulatory Medicine.

The following AAP sections were invited to peer review the guidelines: the Section on Administration and Practice Management; Section on Allergy and Immunology; Section on Breastfeeding; Section on Critical Care; Section on Developmental and Behavioral Pediatrics; Section on Emergency Medicine; Section on Endocrinology; Section on Epidemiology; Section on Public Health and Evidence;

Section on Gastroenterology, Hepatology, and Nutrition; Section on Global Health; Section on Hospital Medicine; Section on Infectious Diseases; Section on International Medical Graduates; Section on Minority Health, Equity, and Inclusion; Section on Neurology; Section on Pediatric Pulmonology and Sleep Medicine; Section on Radiology; and Section on Rheumatology.

Additional peer reviewers included the Family Partnerships Network; Payor Advocacy Advisory Committee; and the AAP Council on Child Abuse and Neglect; Council on Children With Disabilities; Council on Community Pediatrics; Council on Foster Care, Adoption, and Kinship Care; Council on Genetics; and Council on Quality Improvement and Patient Safety.

Finally, external organizations were offered the opportunity to engage in peer review and provide input to the authoring panel. These organizations included the Academy of Nutrition and Dietetics, American Academy of Family Physicians, American Society for Parenteral and Enteral Nutrition, and NASPGHN.

Organizational Approval

The AAP has an extensive organizational approval process that begins following peer review. Senior leader staff review all CPGs and provide comments for clarification and/or improvement. Following revision of the manuscript, the full Board of Directors reviews the draft before it is sent to the AAP Executive Committee for review and approval.

Scope of the Review

The intended audience of the CPG includes health care professionals who are caring for children with faltering weight (such as pediatricians, pediatric gastroenterologists, primary care clinicians, psychologists, social workers, and other providers), caregivers, and policy makers. The intended beneficiaries of the CPG recommendations are children who have faltering weight and their caregivers. Children younger than 5 years with weight faltering should be given greater attention because of the effects on overall development. In addition, because the systematic review was limited to children in this age group, some of the management recommendations may not directly apply to older children.

The Guideline Panel identified the following as relevant subgroups for certain recommendations: children with faltering weight, children with faltering weight who have documented feeding issues, and children with faltering weight and other conditions (ie, severe malnutrition, family history, avoidant/restrictive food intake disorder [ARFID], disordered eating, dysphasia, and additional symptoms).

Concise Statement of Guideline Objectives

AAP CPGs are primarily intended to help PHCPs make decisions about diagnostic and treatment alternatives. Other purposes are to inform policy, education, and advocacy and to articulate future research needs. Although this CPG recommends and suggests evidence-based care, the practice of medicine dictates tailoring care to individual patients and families. Clinicians must make decisions on the basis of each individual patient's clinical presentation. This decision-making ideally occurs through a shared process that considers the patient's and caregiver's values and preferences with respect to the anticipated outcomes of the chosen option. Decisions may be constrained by the realities of a specific clinical setting and local resources, including but not limited to institutional policies, time limitations, and availability of treatments. This CPG may not include all of the appropriate methods of care for the clinical scenarios described. As science advances and new evidence becomes available, recommendations may become outdated. Following these guidelines cannot guarantee successful outcomes.

Statements about the underlying values and preferences as well as qualifying remarks accompanying each recommendation are integral parts of the CPG that serve to facilitate more accurate interpretation and should never be omitted when recommendations from these guidelines are quoted or translated.

PICO Questions

The Guideline Panel participated in the completion of multiple surveys using an online, anonymous SurveyMonkey tool to brainstorm and then prioritize the questions described in Table 3.[23] The Guideline Panel prioritized additional background questions to be addressed in the guideline narrative; these questions did not result in recommendations (see Table 4).

Search Strategy

The accompanying TRs describe the search strategies, including the time period for literature and databases searched, as well as search terms.[21,22] In brief, searches were restricted to studies published in the English language; no restriction was placed on the date of publication. These technical reviews focused on evidence to inform KASs (recommendations).

Inclusion and Exclusion Criteria

Descriptions of the eligibility criteria to answer prioritized PICO questions are provided in the accompanying TRs.[21,22] In summary, studies were included if they described a pediatric population 0 to 5 years of age with FTT who were not being fed via a nasogastric tube and who live in a high-income country (according to the World Bank definition).[24] The Guideline Panel decided to use the World Bank definition of "high-income" in order to best approximate the practice setting in which the CPG is intended to be used.

TABLE 3. Prioritized PICO Questions

Question	Research Process
In children with failure to thrive,[a] is socioeconomic status a risk factor (defined as poor growth or clinician diagnosis)?	Updated systematic literature review
In children with failure to thrive,[a] what are the benefits and harms of performing diagnostic tests to evaluate underlying conditions of faltering weight?	New systematic literature review
In children with failure to thrive,[a] what are the benefits and harms of increased calories of food (alone or in combination) (ie, add peanut butter to diet)?	New systematic literature review
In children with failure to thrive,[a] what are the benefits and harms of feeding oral supplements/higher-calorie formulas (alone or in combination)?	New systematic literature review
In children with failure to thrive,[a] what are the benefits and harms of feeding/speech therapy (alone or in combination) (ie, dietitian, speech therapist, occupational therapist)?	New systematic literature review
What are the benefits and harms of endoscopy in children with failure to thrive?[a] What demographic and clinical features of faltering weight are associated with an increased likelihood of a condition identified on endoscopy?	New systematic literature review

[a] The term "failure to thrive" was used in creating the questions and hence appears in this table. The formulation of the PICO questions preceded the new "faltering weight" nomenclature.

TABLE 4. Questions for the Narrative Section

Question	Research Process
What definitions exist for failure to thrive?[a]	Narrative literature review
What is known about disparities in the evaluation and management of children with failure to thrive?[a] What evaluation and management strategies should health care teams consider to overcome barriers to health equity?	Narrative literature review
What is the prevalence of specific causative conditions identified in children with failure to thrive?[a] What is the prevalence of specific causative conditions in children with failure to thrive[a] who have no other symptoms or signs pointing to such a condition (ie, in children with failure to thrive,[a] what are the other comorbidities/conditions that are diagnosed or identified)?	Narrative literature review

[a] The term "failure to thrive" was used in creating the questions and hence appears in this table. This preceded the new "faltering weight" nomenclature.

Literature Screening Methods

The research team conducted 4 systematic reviews according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards in order to answer the prioritized PICO questions (see Table 2).[25] The systematic review on socioeconomic status (SES) as a risk factor for faltering weight updated a prior review by the National Institute for Health and Care Excellence (NICE).[7] Studies that contained information about the existing definitions of faltering weight, prevalence of underlying conditions, and equity considerations were tagged during screening; information was abstracted from the included studies. Researchers searched for additional evidence related to health equity and costs to address these criteria within the GRADE and evidence-to-decision (EtD) frameworks.[26–28]

Data Extraction

Pertinent information about the study characteristics and results, including information to answer the narrative questions in Table 3, was extracted into a standardized form via Google Sheets. Standardized extraction forms were piloted before use. Data extraction was performed by a member of the research team and checked by another team member.

Certainty Assessment

Risk of bias (RoB) was assessed using the Cochrane Collaboration's Risk of Bias tool for randomized trials (RoB 2.0)[29]; the Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I) tool for nonrandomized studies (ROBINS-I, used for nonrandomized studies of interventions and is the appropriate tool to assess observational studies of interventions for faltering weight)[30]; the Prediction Model Risk Of Bias ASsessment[28] Tool (PROBAST) for prediction models[31]; and the Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2) tool[32] for test accuracy studies.

The certainty in the body of evidence (also known as "quality of the evidence" or "confidence in the estimated effects") was assessed for each effect estimate of the outcomes of interest following the GRADE approach, based on the following domains: RoB, imprecision, consistency and magnitude of the estimates of effects, directness of the evidence, risk of publication bias, presence of large effects, dose-effect relationship, and an assessment of the effect of plausible residual and opposing confounding. The certainty was categorized into 4 levels: high, moderate, low, or very low.[14,23,33]

Data Synthesis and Analysis

For each key question that was addressed with a new or updated systematic evidence review (Table 2), the methodologists and designated clinical leads from the Guideline Panel prepared a GRADE evidence profile and EtD framework using the GRADEpro Guideline Development Tool (http://www.gradepro.org).[26–28,34] The evidence profiles summarize the results of systematic reviews of the literature that were updated or performed for these guidelines. In situations when quantitative synthesis was not possible because of heterogeneity in study designs and/or populations, data were synthesized and reported narratively.

Evidence-to-Decision

The EtD tables addressed beneficial and harmful effects of interventions under consideration, patient values, resource utilization (eg, required resources, cost-effectiveness), health equity, acceptability, and feasibility. The Guideline Panel's respective clinical leads reviewed the draft EtD tables before they were presented to the full Guideline Panel; these leads contributed clinical context and identified additional, indirect evidence. To ensure that recent studies were not missed, during each meeting when the evidence was discussed, Guideline Panel members were asked to bring forward any studies that might fulfill the review eligibility criteria.

During a 2-day in-person meeting (preceded by online communication and virtual meetings about the body of evidence), the Guideline Panel developed recommendations based on the evidence summarized in the profiles and EtD tables. For each recommendation, the Guideline Panel took an individual perspective and voted on judgments for the following criteria: the magnitude of desirable and undesirable effects, values, the balance of benefits and harms, resource requirements, cost-effectiveness, impact on health equity, acceptability, and feasibility.

Guideline Panel members nominated options for voting, and final judgments were decided based on a majority vote. A quorum of Guideline Panel members (eg, 13 or more of the 15 voting members) voted on all decisions. The Guideline Panel agreed on the recommendations (including direction and strength), remarks, and Good Practice Statements through discussion and voting. The final guidelines, including recommendations, were reviewed and approved by all members of the Guideline Panel.

Interpretation of Strong and Conditional Recommendations

The recommendations are labeled as "strong" or "conditional" according to the GRADE approach. The words "the Guideline Panel recommends" are used for *strong* recommendations, and the words "the Guideline Panel suggests" are used for *conditional* recommendations. Table 5 provides GRADE's interpretation of strong and conditional recommendations by patients, clinicians, policy makers, and researchers.

Discordant Recommendations

Infrequently, strong recommendations may be based on low- or very low-certainty evidence in specific scenarios described by the GRADE Working Group.[5] In those situations, the Guideline Panel followed guidance by the GRADE working group, which is outlined in 5 paradigmatic situations, which are described in Table 6.[2] Although discordant recommendations are generally rare, certain clinical topics may yield multiple discordant recommendations because of the research landscape around specific populations or conditions. For example, evidence of harms may be more readily available than evidence of benefits.

TABLE 5. Interpretation of Strong and Conditional Recommendations

Implications for:	Strong Recommendation	Conditional Recommendation
Patients	Most individuals in this situation would want the recommended course of action, and only a small proportion would not.	The majority of individuals in this situation would want the suggested course of action, but many would not. Decision aids may be useful in helping patients to make decisions consistent with their individual risks, values, and preferences.
Clinicians	Most individuals should follow the recommended course of action. Formal decision aids are not likely to be needed to help individual patients and clinicians make decisions consistent with their values and preferences.	Different choices will be appropriate for individual patients; clinicians must help each patient arrive at a management decision consistent with his or her values and preferences. Decision aids may be useful in helping individuals to make decisions consistent with their individual risks, values, and preferences.
Policy makers	The recommendation can be adopted as policy in most situations. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator.	Policy making will require substantial debate and involvement of various contributors. Performance measures should assess whether decision-making is appropriate.
Researchers	The recommendation is supported by credible research or other convincing judgments that make additional research unlikely to alter the recommendation. On occasion, a strong recommendation is based on low or very low certainty of evidence. In such instances, further research may provide important information that alters the recommendations.	The recommendation is likely to be strengthened (for future updates or adaptation) by additional research. An evaluation of the conditions and criteria (and the related judgments, research evidence, and additional considerations) that determined the conditional (rather than strong) recommendation will help identify possible research gaps.

TABLE 6. GRADE's Paradigmatic Situations for Discordant Recommendations
Life-threatening situation with low or very low certainty of benefit.
Low or very low certainty of benefit with high or moderate certainty of harm.
Low or very low certainty of benefit with high or moderate certainty of reduced harm or reduced cost.
High certainty of equivalence between options with low or very low certainty of harm or cost.
Potential catastrophic harm.

Document Review

Before beginning the peer review process, the draft CPG underwent a comprehensive evaluation through plagiarism-detection software, in accordance with the AAP's protocol for new policies. Organizations and internal councils, sections, and committees were invited to review the embargoed manuscript and provide comment. They were afforded 30 days for review per best practice. Reviewers were invited to inform the Guideline Panel of any general or substantive comments for consideration. The Guideline Panel received 283 comments from 27 internal and external collaborative groups. These remarks were disseminated to the Panel's writing groups, which addressed and resolved them prior to finalizing the CPG.

After this comprehensive, rigorous peer review process; comment resolution; and subsequent manuscript finalization, pertinent groups confirmed their approval of the revised CPG. Conflicts of interest were obtained again before publication to confirm that no conflicts existed that might impact authorship. Senior leadership, as well as the AAP Board of Directors and Executive Committee, reviewed and provided input, as necessary, prior to final approval for publication.

KEY CONSIDERATIONS: SOCIOECONOMIC STATUS AND EQUITY

Socioeconomic Status

SES—an indicator of social position that is typically estimated from family income, education level, or occupation status—is associated with a wide variety of health conditions in children.[35,36] The fact that SES is a risk factor for poorer health outcomes raises the question of its association with faltering weight. In addition, regardless of a possible association between SES and faltering weight, health inequalities related to low SES could impact the identification, evaluation, and treatment of children with faltering weight. The results of a review of studies examining the relationship between SES and faltering weight are discussed in this section and in the accompanying TR.[21]

Clinical question 1: Should SES be used as a risk factor for children with faltering weight, or not?

Key Action Statement 1: The AAP Guideline Panel suggests against using SES as an assigned risk factor when diagnosing faltering weight. (Conditional recommendation, very low certainty of evidence.)

Remark for Key Action Statement 1: Clinicians are encouraged to conduct surveillance for risk factors that are related to social drivers of health during all patient encounters, given that they might be predictive of access to recommended therapies and the need for appropriate referral to support programs, such as community organizations, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), etc.

Good Practice Statement: The AAP Guideline Panel emphasizes the importance of entitlement and other social support programs to mitigate the harmful impacts of poverty and social drivers of health, including food insecurity.

Summary of the Evidence

Five observational studies examining the association between SES and FTT met review criteria.[37–41] Blair et al found that parental occupational class had little to no effect on FTT, defined as weight-for-age, weight-for-length, or BMI-for-age, from birth to 9 months of age among infants in the United Kingdom (UK).[37] Another UK sample similarly found that parental affluence, measured by Townsend score, also had little to no effect on FTT in the first 12 months of life. After examining this measure of neighborhood socioeconomic deprivation, the authors reported "no clear trend to poorer growth with higher deprivation quintiles."[38] Data from both studies suggested a possible U-shaped association, with FTT observed most frequently among children in both the lowest and highest SES categories.

A Danish study also reported little to no effect of the municipality where families resided on children's faltering weight in the first 8 months of life.[39] Likewise, a US sample of infants and toddlers found little to no effect of household income on faltering weight, observing that underweight status was less likely among children from the highest SES category when compared with children from the lowest SES category; however, the 95% CI did not exclude the opposite effect (odds ratio [OR]: 0.56; 95% CI: 0.19–1.68).[40]

In contrast to these 4 studies, a Japanese sample found that infants in the lowest quartile of household income had higher rates of faltering weight compared with those in the highest income quartile at 18 months of life (2001 cohort, OR: 1.29; 95% CI: 1.10–1.52; 2010 cohort, OR: 1.27; 95% CI: 1.03–1.56).[41] The presence of more robust national food programs to assist low-SES families in the European and US samples relative to the Japanese sample may explain the heterogeneity in these results, with the strongest association between SES and faltering weight observed in the setting with less support for low-SES families.[38,41]

Thus, although poverty may be associated with faltering weight in low-income countries, the association appears to generally be much weaker in resource-abundant countries.[42] As such, Edwards and colleagues recommended that clinicians be mindful of not inadvertently using SES (or food insecurity, which they also found to be independent of faltering weight) to help make a diagnosis of faltering weight.[40] This is necessary to avoid treating children with similar risk factors differently, potentially leading to SES- or race-related health disparities. Assessing financial stressors or food insecurity can, however, be helpful in identifying and providing needed resources for families.[40]

Additional details regarding the results and EtD framework for this recommendation are available in Appendix B, Table 1, and Appendix B, Table 2, respectively.

Equity

"Equity" and "equality" are often inaccurately used as equivalent constructs but are distinct concepts. With respect to health care, "equity" describes treatment that is fair, impartial, and effective in the context of varying risks other than the presenting problem of faltering weight and associated medical conditions. Such risks are often described as "social drivers of health" and include immigration, language, income, geographic access, household and neighborhood violence, and social status/SES. "Equality," in contrast, is providing the same care to all patients without regard to these factors.

Children who are persistently undernourished[a] are more likely than their well-nourished peers to suffer poverty and inequality in adulthood. Poorly treated faltering weight is a risk factor for future low SES,[43,44] which increases the risk that the children of these individuals will also face undernutrition, thus maintaining a harmful intergenerational cycle that is hard to interrupt.[45]

The multifactorial causes and consequences of faltering weight demand an equitable approach. Thus, a treatment plan must be modified for each patient on the basis of identified physiological/nutritional precipitants and available resources and referrals, reflecting an awareness of each patient's unique sociodemographic factors.

Kachi et al[40] showed that, in the absence of programs outside the health care system to identify and seek to mitigate the impact of social drivers of health, it is difficult to implement equitable identification, evaluation, and treatment of faltering weight.[46–48]

For US families, numerous federal nutrition programs address food insecurity, a social driver that has been associated with faltering weight in some studies.[48] Other less-accessible but essential programs address housing and energy insecurity as well as other hardships that have been linked to faltering weight, whether or not food insecurity is present. The clinical team should become thoroughly familiar with these programs that are potentially available to their patient's families, in terms of both the benefits provided and potential barriers to access. To overcome these barriers, families often may require support from the clinical teams.

Sustained work with in-person navigators in addition to resource lists may facilitate more equitable access to needed services, especially for families with limited English proficiency.[49] The evidence base for this intervention is still in the early stages, however.[50,51]

In addition to the varying resources of the clinical team itself, availability and quality of many needed services are inconsistent throughout the United States because of variations in state policies and budgets, geographic location, and structural racism. Clinicians also do not have equitable access to various specialists that may be needed for optimal diagnosis and treatment when medical complexity contribute to faltering weight.

Addressing mental health in the context of faltering weight must also be considered, studied, and supported by appropriate mental health specialists, including social workers, psychologists, psychiatrists, and developmental specialists. Evaluation of the caregiver-child dyad and family dynamic should be considered. Parental mental health needs may require intervention so that the underlying causes of faltering weight can be adequately addressed, particularly given the potential impact of parents' mental health conditions on medical regimens and adherence to treatment plans.[52,53]

In addition to addressing mental health, other cultural brokers (ie, interpreters, community workers) may be needed to make the appropriate assessment and collaborative treatment plans. Thus, to deliver equitable care, policies are needed to reduce or eliminate barriers to health care and improve access to beneficial social and economic programs.[54]

DIAGNOSIS AND TESTING

Faltering weight is a symptom with many causes. Although testing is often performed (including imaging studies, laboratory tests, and endoscopy), it rarely leads to identification of the underlying cause of faltering weight. Determining the cause or causes of faltering weight is critical for providing appropriate treatment to resolve undernutrition. In some contexts, testing can aid the diagnostic process; PHCPs should use their best clinical judgments to determine the most appropriate tests to use and/or to which specialists to make a referral. In most cases, however, diagnostic testing is not needed and may add to additional worry, costs, and unnecessary or prolonged hospitalization.

[a] The Guideline Panel considers "persistent" to apply when the child is undernourished for 3 or more months, when basic interventions have been conducted, and the child is still not growing as one would expect. Of note, however, this is highly dependent on the child's age.

Diagnostic Tests

Clinical Question 2: Should diagnostic tests be used to screen for underlying conditions for children with faltering weight, or not?

Key Action Statement 2A: In children who have certain conditions that suggest a focal evaluation (ie, severity of malnutrition,[55,56] time since diagnosis, family history, additional signs or symptoms) or have persistent faltering weight, the AAP Guideline Panel suggests diagnostic testing rather than no testing. (Conditional recommendation, very low certainty of evidence.)

Key Action Statement 2B: In children without specific signs, symptoms, and findings that would prompt a focal evaluation, the AAP Guideline Panel recommends against diagnostic testing as part of the initial routine workup for faltering weight. (Strong recommendation, very low certainty of evidence.)

Remark for Key Action Statement 2B: Diagnostic tests as part of the initial workup had very low certainty with trivial benefit, and could result in moderate harm, high costs, reduced health equity, and issues with accessibility and feasibility, warranting a strong recommendation against its use. (Second paradigmatic situation from GRADE guidance.[1,2])

Good Practice Statement: During the initial evaluation of faltering weight or suspected faltering weight, the AAP Guideline Panel recommends that all children receive a thorough history, physical examination, and developmental evaluation (eg, oral-motor, fine motor skills); family and social history; medical and surgical history; and an assessment of growth, feeding history, and other difficulties and concerns (eg, cultural norms, parental feeding practices, and breastfeeding history).

Good Practice Statement: Accurate anthropometric measurements are essential to monitor growth in all children and in the diagnosis of faltering weight. Recumbent length measurement is recommended for all children younger than 2 years (birth through 23 months) using an infantometer with a fixed head piece, horizontal backboard, and adjustable foot piece, when possible. (Some practices use other methods, as needed.) Standing height should be obtained using a stadiometer with a fixed vertical backboard and an adjustable head piece for all children 2 years and older who are able to stand unassisted. For children who cannot stand, PHCPs are encouraged to follow best practice for children with special health care needs. Weight should ideally be obtained using a digital weight scale, without clothes for infants younger than 2 years, and in only light clothing and without shoes for children 2 years and older. For further details on these measurements, see the CDC's *National Health and Nutrition Examination Survey (NHANES): Anthropometry Procedures Manual*.[3]

Summary of the Evidence

Six studies (3 retrospective studies[57–59] and 3 prospective cohort studies)[60–62] were identified that examined diagnostic tests vs no diagnostic tests to evaluate underlying conditions in children with FTT. Three studies evaluated diagnostic tests in children referred to a clinic requiring evaluation for FTT,[60,62,63] and the others[57,58,61] evaluated diagnostic tests in hospitalized children with a confirmed or suspected diagnosis of FTT.

Of the 6 included studies, 3 assessed only laboratory tests[57,62,63]; 2 assessed laboratory, imaging, and endoscopic evaluations[60,61]; and 1 had no mention of a test used.[57] Lastly, 1 study reported on the number of tests performed,[61] 3 reported on the prevalence of underlying conditions only,[58,60,63] and 2 reported on both test accuracy and the prevalence of underlying conditions.[57,62]

Benefits

Two studies reported diagnostic test accuracy estimates when evaluating the underlying conditions of children with FTT.[57,62] Adedoyin et al reported that bicarbonate levels were normal in 35 of 36 children using venous blood gas testing, compared with 9 of 36 children using routine biochemical testing, none of whom required reevaluation for renal tubular acidosis (very low certainty).[62] A study by Puls et al reported the sensitivity and specificity of using weight as a tool to differentiate inadequate intake from other underlying conditions of FTT at 91.1% and 22.2%, respectively (very low certainty).[57]

All of the included studies investigated the prevalence of underlying conditions among children with FTT. Two studies reported the prevalence of distinct underlying causes of FTT (range: 2.8% to 14%) (very low certainty).[57,61]

Seven studies reported organic and nonorganic causes. Although the terms "organic" and "nonorganic" are outdated, most of the included studies categorized the ultimate cause of FTT in this way. For the purposes of this CPG, the terminology reported in the included studies is used without modification. Four studies reported a prevalence of organic causes ranging from 18% to 31%,[57,58,61,63] and 3 studies reported a prevalence of nonorganic causes ranging from 45% to 89% (very low certainty).[58,60,63] Additionally, 1 study reported a prevalence of mixed (ie, both organic and nonorganic) causes at 35%,[63] and 2 studies reported a prevalence of unidentifiable causes ranging from 2% to 24%.[58,63]

Two studies reported the utility of tests in aiding the diagnosis of underlying causes of FTT.[60,61] In an outpatient cohort of children seen for FTT in a gastroenterology clinic, Larson-Nath and Goday found that 6.8% of laboratory tests, imaging tests, and endoscopic evaluations led to a diagnostic etiology of FTT (very low certainty).[60] In a separate cohort of children admitted to the hospital with FTT,

Larson-Nath et al found that 1% of laboratory tests, 5% of radiologic tests, and none of the endoscopies led to a cause of FTT (very low certainty).[61] Another study (Berwick et al) reviewed the medical records of 122 infants who were admitted to the hospital with FTT and found that 0.8% of all tests showed an abnormality that contributed to a diagnosis of an underlying etiology.[6]

Harms

No included studies reported on the undesirable effects of diagnostic tests to evaluate underlying conditions in children with FTT. The Guideline Panel discussed potential harms, including an increased risk of false-positive results. Adedoyin et al suggest that a low-serum bicarbonate on routine biochemistry may overestimate those who are at risk of renal tubular acidosis who require further evaluation by nephrology.[62]

Furthermore, added tests may delay the processing of results; may be unnecessary; and may increase costs, hospital admissions, subspecialty referrals, and family anxiety.[64] Low pretest probability results in low positive predictive value, which may result in a testing cascade of normal tests. For families with low SES or transportation issues, added testing may also lead to unnecessary trips to the doctor and, in more challenging cases, potential involvement of child protective services because of noncompliance with medical care (even though that care may later be found to have been unnecessary).

Overall, the certainty of the estimated effects is very low because of RoB (concerns with external validity and internal validity), indirectness (the patient population was recruited from a hospitalized or subspecialty clinic setting instead of a general pediatrician setting), and imprecision (studies did not meet the optimal information size to estimate test accuracy).

Additional details regarding the results informing this recommendation are available in Appendix B, Table 3.

Other EtD Criteria and Considerations

For all children with faltering weight, the Guideline Panel judged that the balance of effects probably favors no diagnostic tests to evaluate underlying conditions because of the tests' trivial benefits and moderate harms. On the basis of the body of available evidence, in the absence of persistent faltering weight (ie, duration of 3 or more months, see footnote above) or findings on history or physical examination that suggest a cause of faltering weight, diagnostic testing is not indicated and may not have an added value for suggesting an underlying cause of faltering weight.

Although diagnostic tests may have the potential to identify causes of faltering weight, there is an emphasis on the risks of false-positive results and the low prevalence of underlying conditions. Although there is variability in the acceptability of diagnostic tests, the Guideline Panel agreed they were probably feasible. There was, however, possibly important uncertainty or variability in the values of patients and caregivers based on the polarized opinions of caregivers and the broad spectrum of possible tests that could be performed.

The Guideline Panel considered evidence from Larson-Nath et al, which assessed hospital charges and found that patients with nonorganic FTT spent $648 on initial laboratory evaluations—not including any genetic testing.[61] On the basis of these considerations, the Guideline Panel judged that there are moderate costs associated with diagnostic tests to evaluate underlying conditions.

Additionally, the Guideline Panel acknowledged the difference in considerations and implications of diagnostic tests for children with persistent faltering weight, family history, and/or signs or symptoms that require additional diagnostic testing. For example, Casey et al suggest that children and high-risk families may require more intensive therapy (ie, inpatient management, foster care placement, psychiatric care, etc). Other children who are not high-risk may only need supportive and nutritional care.[63] Testing rarely leads to a diagnosis without signs or symptoms of an underlying process that leads to faltering weight and, in those cases, the child would not respond to nutritional interventions alone.[61]

Therefore, the Guideline Panel determined that the balance of effects favors diagnostic tests to evaluate underlying conditions given the moderate benefits and small harms, in the setting of persistent faltering weight, family history, and/or signs or symptoms on history or examination. The Guideline Panel also found it difficult to identify timelines for reevaluation, testing, and/or hospitalization. The Panel believes that this depends on the child's age, expected growth velocity, and severity of faltering weight; it will need to be addressed using clinical judgment.

The Guideline Panel suggests that breastfed infants with faltering weight benefit from a thorough breastfeeding assessment conducted by a trained lactation professional or other PHCP who is comfortable with managing faltering weight in these infants. Supplementation in breastfed infants should be limited, when appropriate, and conducted under the guidance of a trained lactation professional in order to preserve lactation and the breastfeeding relationship.

Finally, although micronutrient deficiencies may accompany faltering weight, such deficiencies are outside the scope of this CPG. The Guideline Panel believes that a thorough dietary history (conducted with or without the aid of a pediatric dietitian) may increase the suspicion for such micronutrient deficiencies, which can be confirmed through judicious testing and then treated.

Additional details regarding the EtD framework for this recommendation are available in Appendix B, Table 4.

Endoscopy

Clinical Question 3: Should endoscopy be used for children with faltering weight, or not?

Key Action Statement 3A: In children with faltering weight, the Guideline Panel recommends against endoscopy as part of the initial routine workup. (Strong recommendation, very low certainty of evidence.)

Remark for Key Action Statement 3A: Endoscopy as part of the diagnostic workup had very low certainty of trivial benefit (inconclusive results of little benefit) but could result in moderate harm (procedural complications), high costs, and reduced health equity (including accessibility and feasibility). These considerations warrant a strong recommendation against using endoscopy as part of the initial, routine workup. (Second paradigmatic situation from GRADE guidance.[1,2])

Key Action Statement 3B: In children with persistent faltering weight or who have concerns for conditions that cannot be diagnosed without endoscopy, the Guideline Panel suggests endoscopy with biopsy rather than no endoscopy. (Conditional recommendation, very low certainty of evidence.)

Good Practice Statement: When referral to a gastroenterologist is needed for faltering weight, the CPG recommends referral to a pediatric gastroenterologist who can critically assess the need for endoscopy and, when endoscopy is indicated, obtain the necessary biopsy specimens in addition to performing the requisite endoscopy.

Summary of the Evidence

Nine retrospective cohort studies were identified to inform the comparison of endoscopy vs no endoscopy for children with FTT.[60,61,65–71] Of these, 7 studies[60,65–69,71] included children referred for endoscopy; 1 included children who required surgical correction of gastroesophageal reflux,[70] most of which were indicated by FTT; and 1 included children who were hospitalized with a diagnosis of FTT.[61] Seven studies reported on the endoscopic diagnosis of conditions[60,61,65–70]; 2 reported on the histologic findings of endoscopies[66,68]; and 1 reported on the odds of an endoscopic and histologic abnormality in children presenting with FTT.[69]

Benefits

Seven studies reported on the endoscopic diagnosis of conditions in children with FTT.[60,61,65,67–70] Four studies showed that 5.9% to 94.1% of endoscopies for FTT had abnormal findings, either grossly or histologically abnormal (very low certainty).[60,65,69,70] In 3 studies, none of the patients with FTT had abnormal findings on endoscopy (very low certainty).[61,67,68] Two studies reported on positive histologic results in children with FTT, suggesting that 7.1% to 59.6% of the included patients had positive histopathology (very low certainty).[66,68]

Sheiko et al reported on the odds of FTT and endoscopic and histologic abnormality.[69] The researchers found that 20% of children undergoing endoscopy for FTT had visual or histologic abnormalities. Additionally, compared with children undergoing endoscopy for abdominal pain, very low-certainty evidence suggested that children undergoing endoscopy for FTT may have decreased odds of endoscopic abnormality (OR: 0.83; 95% CI: 0.44–1.57) and increased odds of histologic abnormality (OR: 1.16; 95% CI: 0.66–2.03). This study did not comment on how many of the children had symptoms in addition to FTT or whether the finding on endoscopy was the cause of FTT.

Harms

There was no evidence identified about children undergoing endoscopy specifically with FTT. Indirect evidence from 3 studies reported on the harms and adverse events experienced by children undergoing endoscopy, however.[72–74]

A single-center study included 6591 children undergoing esophagogastro-duodenoscopy, of whom 2% were infants and 24% were toddlers.[74] The authors reported that 1.2% had a grade 2 adverse event, most commonly attributable to abdominal pain, fever, bleeding, and chest pain. Biber et al reported that 4.8% of anesthesia-related complications in children undergoing endoscopy were primarily attributable to persistent desaturations, airway obstruction, cough, and laryngospasm.[72] There were no deaths and cardiopulmonary resuscitation was not required. Lastly, 1 study included children undergoing hernia repair and receiving spinal vs general anesthesia; the findings suggested little to no difference in cognitive impairment at 5 years of age (mean difference [MD]: 0.6 points lower; 95% CI: 3.3 points lower to 2.1 points higher; very low certainty).[73]

Overall, the certainty of the estimated effects is very low because of concerns with study design and risk of bias (patient selection), indirectness, inconsistency, and small sample size.

Additional details regarding the results informing this recommendation are available in Appendix B, Table 5.

Other EtD Criteria and Considerations

For all children with faltering weight, the Guideline Panel judged endoscopy as part of the diagnostic workup as having very low certainty of trivial benefit (low yield of endoscopy elucidating a cause of faltering weight when other signs or symptoms are absent) and as possibly resulting in moderate harm from procedural complications, high costs, reduced health equity, and issues with accessibility and feasibility. This warranted a strong recommendation

against its use (second paradigmatic situation from GRADE guidance).[1,2]

Additionally, the Guideline Panel emphasized the difference in considerations and implications of endoscopy for children (a) who have faltering weight with other symptoms that may warrant an endoscopy; (b) who have persistent faltering weight while following treatment recommendations; or (c) with faltering weight and concerns for conditions that cannot be diagnosed without endoscopy. The Guideline Panel agreed that these populations may experience a greater benefit and small harms from undergoing endoscopy. The Guideline Panel highlighted the procedure's large direct and indirect costs and the fact that acceptability and feasibility of endoscopy vary by population and clinical situation, agreeing that endoscopy probably reduces equity.

Children should be considered for endoscopy if they have faltering weight as well as persistent vomiting, significant feeding problems, other atopic diseases (particularly food allergies), dysphagia, positive screening for celiac disease, and/or family history of celiac disease or eosinophilic esophagitis. As with other diagnostic testing, if faltering weight persists after interventions to improve weight, it is reasonable to consider endoscopy to identify a cause of faltering weight, even in the absence of other symptoms. Although endoscopy can support other diagnoses that may present with faltering weight as a symptom, it typically requires anesthesia, which has inherent risks.

Concerns have been raised about anesthetic exposure in animal models, in which neuronal elimination with subsequent learning and memory impairment have been demonstrated.[75] Although some cohort studies in young children who have undergone anesthesia have demonstrated changes in cerebral imaging and changes in cognition, other studies have not corroborated these findings. Importantly, a randomized study of approximately 4000 infants undergoing herniorrhaphy showed no difference in neurodevelopmental outcomes at 5 years of age when general anesthesia was compared with awake-regional anesthesia.[73]

On the basis of these findings, the Guideline Panel highlighted the importance of discussing the benefits and harms of the procedure with the patient and caregiver. When making these judgments, the Guideline Panel emphasized that endoscopy should be performed by a pediatric gastroenterologist to minimize risks and biopsies should be obtained for patients, even in the setting of grossly normal tissue, to ensure highest diagnostic yield.

Additional details regarding the EtD framework for this recommendation are available in Appendix B, Table 6.

CO-OCCURRING CONDITIONS

A realistic fear for parents and pediatricians is that an underlying condition is present in a child who has faltering weight. This has previously been described as "organic" vs "nonorganic" faltering weight (see above). Currently, initial efforts are focused on nutritional modifications to increase weight gain. If that fails, attention turns to investigating various organ systems within the body that can impact weight gain.

Children who are hospitalized with FTT often have a higher incidence of these co-occurring conditions within some organ systems but not others. Of course, there remains a question of correlation: does the co-occurring condition cause faltering weight or not?

The prevalence of co-occurring conditions is not trivial and can often be detected with a thorough history, physical examination, and basic testing. Co-occurring conditions are rare but important to consider on the differential diagnosis for children with faltering weight. Knowing the prevalence of these conditions in both the hospital and outpatient settings can guide the PHCP on further evaluation for a child with faltering weight.

Hospitalized Populations

When evaluating a child who has been hospitalized for faltering weight, consider the 5 most-common co-occurring conditions that were identified in 3 studies obtained in the systematic review (see Table 7).[57,60,61] The cumulative sample size is low and should be interpreted within the context of the patient's clinical picture. These conditions are as follows:

1. Congenital heart disease
2. Gastroesophageal reflux disease (GERD)
3. Swallowing dysfunction
   a. Dysphagia
   b. Anatomic abnormalities, such as laryngomalacia or cleft palate
4. Neurologic disease
5. Genetic abnormalities/congenital syndrome

Outpatient Populations

When evaluating a child in the outpatient setting for faltering weight, consider the 5 most-common co-occurring conditions,[57,60,68] which were derived from the same articles referenced above (see Table 8). As above, the cumulative sample size is low and should be interpreted within the context of the patient's clinical picture. These conditions are as follows:

1. Gastrointestinal disease
2. Pulmonary disease
3. Food allergy
4. Genetic abnormalities/congenital syndrome
5. Neurologic disease

TABLE 7. Co-occurring Conditions in Children Hospitalized for Faltering Weight

Hospitalized Populations		
Category	**Condition as Reported in Source Study**	**Prevalence Data (Source)**
Neurologic (eg, increased intracranial pressure [ICP], brain malformations, cerebral palsy)	Neurologic disease	8/43, 19% (Larson-Nath 2018)
	Epilepsy or neurologic impairment including cerebral palsy	23/666, 3.5% (Helin 2020)
Swallowing dysfunction or aspiration (sometimes attributable to neurologic conditions but not necessarily)	Dysphagia	74/331, 22.4% (Puls 2018)
	Upper airway abnormalities (laryngomalacia, cleft lip and/or palate)	7/43, 16% (Larson-Nath 2018)
Congenital heart disease (less often acquired)	Cardiac disorders	13/43, 30% (Larson-Nath 2018)
Pulmonary disease (eg, cystic fibrosis, bronchopulmonary dysplasia)	Pulmonary disease	4/43, 9% (Larson-Nath 2018)
Kidney disease (eg, renal tubular acidosis)	Renal disease	1/43, 2% (Larson-Nath 2018)
Gastritis/esophagitis (eg, eosinophilic esophagitis, *Helicobacter pylori* infection)	"Gastrointestinal disorders"	3/43, 7% (Larson-Nath 2018)
	"Functional GI disorders"	47/666, 7.6% (Helin 2020)
GERD	GERD	93/331, 28.1% (Puls 2018)
Food allergy (immunoglobulin E [IgE] or otherwise)	Atopy (eczema or food and/or environmental allergies)	1/43, 2% (Larson-Nath 2018)
	Food allergies with GI symptoms	26/666, 3.9% (Helin 2020)
Genetic abnormalities (eg, chromosomal abnormalities, single gene mutations)	Genetic/metabolic disorders	6/43, 14% (Larson-Nath 2018)
	"Congenital syndrome"	75/666, 11.3% (Helin 2020)
Other	"Organic pathology"	63/331, 19% (Puls 2018)
	"Developmental delay"	16/43, 37% (Larson-Nath 2018)
	Hematologic disease	1/43, 2% (Larson-Nath 2018)
	Orthopedic disorders	3/43, 7% (Larson-Nath 2018)
	Dermatologic disease	1/43, 2% (Larson-Nath 2018)
	"Chronic condition such as asthma and/or atopy"	100/666, 15% (Helin 2020)

TREATMENT

Nutritional support is important for children with faltering weight in order to maintain the nutritional status of the child and to encourage growth and development. Increased caloric intake may be used to promote weight gain, support development, and improve the child's overall health; this is the current standard of care. Yet, there are questions with respect to the efficacy of increased caloric intake. In addition, the evidence is uncertain with respect to the efficacy of oral nutritional supplements used to treat faltering weight.

Although studies from the developing world were excluded from the review, there are studies correlating that early stunting (which is, presumably, the result of untreated faltering weight) lead to significant worse cognitive, social outcomes in adulthood.[76] Equally important is the fact that, when children recovered from this early malnutrition (again, presumably via weight gain leading to gains in height), children up to at least 15 years of age have better academic and cognitive outcomes.[77,78] Hence, the KAS focus on weight gain as a crucial goal in reversing faltering weight.

Increased Calories

Treatment Clinical Question 1: Should increased calories of food/energy be used for children with faltering weight, or not?

Key Action Statement 4: In children with faltering weight, the Guideline Panel recommends the use of increased calories of food/energy rather than no increased calories of food/energy. (Strong recommendation, very low certainty of evidence.)

Remark for Key Action Statement 4: Increased calories of food/energy may result in large benefits and increased health equity with the possibility of small harms (ie, excessive weight gain, added stress, force-feeding), warranting a strong recommendation for the intervention (third paradigmatic situation from GRADE guidance).[1,2]

Summary of the Evidence

One retrospective cohort study examined increased calories of food/energy vs no increased calories of food/energy in children with FTT and reported on weight gain assessed with growth quotient.[79]

TABLE 8. Co-occurring Conditions in Children in Outpatient Settings for Faltering Weight

Outpatient Populations		
Category	**Condition as Reported in Source Study**	**Prevalence Data (Source)**
Neurologic (eg, increased ICP, brain malformations, cerebral palsy)	Neurologic disease	14/154, 9% (Casey 1984) 7/44, 16% (Larson-Nath 2016)
Swallowing dysfunction or aspiration (sometimes attributable to neurologic conditions but not necessarily)	Upper airway abnormalities (laryngomalacia, cleft lip and/or palate)	3/44, 7% (Larson-Nath 2016)
Congenital heart disease (less often acquired)	Cardiologic disease	5/154, 3% (Casey 1984)
	Congenital heart disease	1/44, 2% (Larson-Nath 2016)
Pulmonary disease (eg, cystic fibrosis, bronchopulmonary dysplasia)	Respiratory disease	28/154, 18% (Casey 1984)
	Pulmonary disease	11/44, 25% (Larson-Nath 2016)
Kidney disease (eg, renal tubular acidosis)	Renal tubular acidosis	1/36, 2.8% (Adedoyin 2003)
	Renal disease	2/44, 5% (Larson-Nath 2016)
Food allergy (IgE or otherwise)	Atopy (eczema or food and/or environmental allergies)	7/44, 16% (Larson-Nath 2016)
Gastrointestinal tract infections	Gastrointestinal disease	52/154, 34% (Casey 1984)
Genetic abnormalities (eg, chromosomal abnormalities, single gene mutations)	Genetic/metabolic disorders	2/44, 5% (Larson-Nath 2016)
	Inborn errors of metabolism	NR
	Storage diseases	NR
	"Congenital syndrome"	29/154, 19% (Casey 1984)
	Serious congenital disorders including hydrocephalus, malformations of vital organs, metabolic diseases, Down syndrome	91/6090, 1.5% (Olsen 2010)
Developmental differences	"Development" disease	20/154, 13% (Casey 1984)
	Developmental delay"	17/44, 39% (Larson-Nath 2016)
	"Other" disease	8/154, 5% (Casey 1984)
	Attention-deficit/hyperactivity disorder	5/44, 11% (Larson-Nath 2016)
	Hematologic disease	2/44, 5% (Larson-Nath 2016)
	Orthopedic disorders	2/44, 5% (Larson-Nath 2016)

Benefits

Bithoney and colleagues evaluated the impact on the weight gain of 160 children with FTT of a multidisciplinary team treatment consisting of calorie-dense formulas and prescription of high-calorie foods and a primary care clinic approach where patients received usual care.[79] Although the treatment received at a multidisciplinary growth clinic may result in increased weight compared with treatment received at a primary care clinic (MD: 0.57; 95% CI: 0.44 higher to 0.7 higher), the evidence is very uncertain. Furthermore, although the study authors may have found a significant increased mean difference of weight gain for both growth quotient and mean grams per day, they combined the intervention of interest with other therapies and services; this makes the true impact of the intervention difficult to determine.

Harms

No included studies reported on the harms of increased calories/energy in children with faltering weight. However, the Guideline Panel discussed potential harms that could occur as a result of increasing calories in children's diets. These harms include added stress to the caregiver and child around feeding and an increased risk of excessive weight gain because of inappropriate implementation or prolonged duration of treatment without consideration of evolving nutritional needs. There is also a risk of force-feeding of children using this approach if caregivers are too aggressive in trying to get their child to gain weight. Overall, the certainty of the evidence is very low because of serious concerns with risk of bias, indirectness, and imprecision.

Additional details regarding the results informing this recommendation are available in Appendix B, Table 7.

Other EtD Criteria and Considerations

The Guideline Panel judged increased calories of food/energy as possibly resulting in large benefits and increased health equity with the possibility of small harms (excessive weight gain, added stress), warranting a strong recommendation for the intervention (third paradigmatic situation from GRADE guidance).[1,2]

Increasing calories of food/energy that contains the macronutrient and micronutrients needed for optimal growth (eg, complete nutrition) is generally acceptable and feasible; however, this varies based on food type, access, and any additional preparation required.

Another important consideration is the magnitude of the resources required, because many factors can affect implementation. These include the age of the child, availability of insurance and social support systems, the type of food needed, and the possibility of increasing calories being coupled with education. Individuals with reduced access to resources (such as that stemming from financial situations or geographic location) may not be able to provide increased calories from food or beverages to their children with faltering weight.

It is important to assess energy being consumed vs energy goals. A pediatric dietitian could play a vital role in this regard. A careful assessment should also be made to avoid force-feeding children. Some children will benefit from a formal evaluation by a feeding therapist prior to trying to increase energy provision.

When making a judgment about patients' and caregivers' values, the Guideline Panel noted that caregivers would find their child's weight gain very important to them while considering the possibility of excessive weight gain. The Guideline Panel highlighted the importance of addressing lifestyle during the assessment. It is also important to provide education on the desirable and undesirable consequences of increasing calories of food/energy, appropriate strategies for providing increased calories of foods, factors that can support diet adequacy (eg, structured family mealtimes and modeling of preferred mealtime behaviors), and factors that impede intake of adequate calories from healthful foods (eg, excess fluid intake).

The Guideline Panel emphasizes the importance of regular follow-up to monitor for excess weight gain and to support offering a variety of healthful foods. Screening of caregivers for perceptions regarding weight and diet (including disordered eating habits) may be indicated. Adjustments to foods served should be made if excessive weight gain occurs.

Additional details regarding the EtD framework for this recommendation are available in Appendix B, Table 8.

Oral Supplementation

Clinical Question 5: Should oral supplements[b]/higher-calorie formulas[c] be used for children with faltering weight, or not?

Key Action Statement 5: In children with faltering weight, the Guideline Panel suggests the use of oral nutritional supplementation rather than no oral nutritional supplementation. (Conditional recommendation, very low certainty of evidence.)

Remark for Key Action Statement 5: Use of higher-calorie formulas/human milk supplementation for infants or oral nutritional supplements for children older than 12 months may support improved weight gain. However, some families may lack access to these resources (eg, because of high costs, geographic location, and/or lack of insurance coverage or WIC). Additionally, outcomes could include excessive weight gain, reduced intake of foods at mealtimes, and eventual product burnout. These risks warrant a conditional recommendation for the intervention. When formula is used to increase the energy density of human milk or used as a supplement, it should be done with minimal disruption to lactation whenever possible.

Summary of the Evidence

Two studies (1 retrospective cohort and 1 crossover cohort study) evaluated the effect of oral supplementation/higher-calorie formula vs no oral supplementation/higher-calorie formula in children with FTT.[79,80] Bithoney et al included children who were referred to a growth nutrition clinic for FTT,[79] and Khoshoo et al included children with "non-organic" FTT.[80] Of the 2 studies, 1 reported on weight gain assessed with growth quotient,[79] and the other reported on weight gain assessed with mean grams per day gained and energy intake.[80]

Benefits

Bithoney et al informed both the clinical question on increased calories of food/energy and the clinical question on oral supplementation/higher-calorie formula in which a multidisciplinary team group approach may result in increased weight gain in children with FTT, compared with a primary care clinic approach (MD: 0.57; 95% CI: 0.44 higher to 0.70 higher; very low certainty).[79]

Khoshoo et al conducted a crossover study in which children with malnutrition received a regular-strength formula for 3 days and then a higher-calorie formula for 3 days after a wash-out period.[80] Very low-certainty evidence suggested that, compared with regular-strength formula, higher-calorie formula may increase weight gain (MD: 17.8 g/d more; 95% CI: 12 g/d fewer to 47.6 g/d more) and energy intake (MD: 121 kJ/kg/d more; 95% CI: 25.6 kJ/kg/d fewer to 267.6 kJ/kg/d more).

Finally, very low-certainty evidence from an abstract reporting the results of a randomized controlled trial (RCT) suggests that, compared with children who did not receive oral nutritional supplements, children aged 2 to 12 years who received oral nutritional supplements may experience an increase in body weight (MD: 0.1 kg higher;

[b] Oral supplements are typically ≥30 kcal/oz formulas that are used in children older than 1 year; all of these beverages can be used via tubes.

[c] High-calorie formulas are any nutritious beverages that have an energy density >20 kcal/oz.

95% CI: 0.04 kg higher to 0.16 kg higher) and energy intake (MD: 56 kcal/d higher; 95% CI: 28.46 kcal/d higher to 83.54 kcal/d higher).[81]

Additionally, indirect evidence from 2 studies was used to inform the clinical question.[60,82] A systematic review that included older children (aged 9 months to 12 years) and children with varying degrees of undernutrition from a low- to middle-income country (n = 2287) showed that children in the supplementation (eg, intervention) group experienced greater gains in weight (0.423 kg, [0.234, 0.613]) and height (0.417 cm [0.059, 0.776]) vs control groups.[82] The other study described gains in weight *z* score (0.28 ± 0.41), height *z* score (0.12 ± 0.53), weight-for-length *z* score ($0.24 \pm 0.1.1$), and BMI *z* score ($0.45 \pm 0.1.4$) in 70 children younger than 2 years after clinicians recommended increasing calories, avoiding grazing, and structuring meals and snacks.[60]

Finally, a systematic review of 10 RCTs showed significantly improved weight and height gain in children treated with oral nutrition supplementation, which was likely attributable to improved nutrition intake.[83]

Harms

No adverse events were reported in the crossover study by Khoshoo et al. Specifically, there were no abnormal serum electrolyte values for all infants.[80] The Guideline Panel discussed other potential harms, including increased costs; treatment discontinuation because of allergies to milk, soy, or other formula components; excessive weight gain; increased risk for dental caries; the potential of slowing oral feeding progress resulting from a preference of formula over solids; and increased caregiver and child stress and anxiety over additional formula intake in a child with feeding difficulties. The Guideline Panel also noted similar potential harms that could occur from increasing calories in children's diets with oral supplements, as seen with increasing overall calories. These include added stress to the caregiver and child around feeding and an increased risk of excessive weight gain because of inappropriate implementation or prolonged duration of treatment without consideration of evolving nutritional needs. There is also a risk of force-feeding children using this approach, if caregivers are too aggressive in trying to get their child to gain weight.

Overall, the certainty of the evidence is very low because of very serious concerns with risk of bias, indirectness, and imprecision.

Additional details regarding the results informing this recommendation are available in Appendix B, Table 9.

Other EtD Criteria and Considerations

The end-goal of this intervention is weight gain and maintenance with solid foods. Nonetheless, the Guideline Panel discussed the fact that caregivers may have negative perceptions of weight gain because of a misunderstanding of pediatric weight measurements and/or the increased risk of excessive weight gain. Although there is probably no important uncertainty or variability in the values of patients and caregivers, the Guideline Panel highlighted the importance of providing education on the pros and cons of oral nutritional supplementation and higher-calorie foods. Screening caregivers for their perceptions regarding weight and diet—including disordered eating habits—may also be indicated.

Additionally, patients who are prescribed oral nutritional supplements and high-calorie formulas should be regularly monitored to assess changes in anthropometry. It is acceptable and feasible to implement oral nutritional supplements and higher-calorie foods for most families. Nonetheless, in practice, treatment will often involve multiple, simultaneous interventions, including education. The Guideline Panel agreed that there are moderate costs associated with oral nutritional supplements and higher-calorie foods, although this depends on various factors such as the child's age, duration of supplementation, insurance, and availability of social support programs.

Although oral nutritional supplements and higher-calorie foods are not inherently inequitable, the aforementioned factors could potentially increase inequality. Some families have more resources and can more easily access special nutritional supplements and formulas through insurance coverage, enrollment in WIC or the Supplemental Nutrition Assistance Program (SNAP), or personal wealth.

Additional details regarding the EtD framework for this recommendation are available in Appendix B, Table 10.

Therapy

Clinical Question 6: Should therapy for pediatric feeding disorder be used for children with faltering weight who have documented feeding difficulties, or not?

Key Action Statement 6: In children with faltering weight who have documented feeding issues, the Guideline Panel suggests therapy for pediatric feeding disorder rather than no therapy for pediatric feeding disorder. (Conditional recommendation, very low certainty of evidence.)

Feeding difficulties (defined as "pediatric feeding disorder") can commonly be associated with faltering weight. Pediatric feeding disorder includes 4 domains: medical, nutrition, feeding skill, and psychosocial. Children may need care in all of these domains and may benefit from a multidisciplinary team that includes pediatric dietitians and pediatric psychologists. Symptoms include feeding refusal, certain texture preferences, and difficulty swallowing.

Assessment and potential intervention to address these feeding difficulties can be beneficial. The American Speech-Language-Hearing Association's National Center for Evidence-based Practice defines oral-motor exercise treatments as follows: activities involving sensory

stimulation to or actions of the lips, jaw, tongue, soft palate, larynx, and respiratory muscles, which are intended to influence the physiological underpinnings of the oropharyngeal mechanism and, thus, improve its functions.[84] The specialists who typically provide such therapies include speech-language pathologists and occupational therapists. It is ideal for these therapists to have training in pediatric dysphagia and pediatric feeding disorders.

Summary of the Evidence

Three studies (2 RCTs[85,86] and 1 observational study[79]) were identified to inform the assessment of providing therapy for feeding difficulties vs no therapy for feeding difficulties in children with FTT. The studies reported on various feeding interventions, but none directly evaluated feeding or speech therapy.

Bithoney et al evaluated the impact of multidisciplinary clinic team treatment consisting of calorie-dense formulas and prescription of high-calorie foods, compared with a primary care clinic approach where patients received usual care for weight gain.[79] Two studies (Black et al, Raynor et al) compared a clinic-plus-home intervention with a clinic-only intervention.[85,86]

Wright et al compared a structured health visitor management intervention (which included a diagnosis of FTT and visits by a health visitor with special training in identifying dietary problems) with standard management.[87]

Three studies assessed weight gain,[79,85,86] and 2 assessed height.[85,86] Additionally, 1 study assessed energy intake,[86] and 2 studies assessed cognitive and motor development.[85,86]

Benefits

Low-certainty evidence from 2 RCTs suggested that feeding and speech therapy results in a small increase in weight gain as assessed with BMI and weight *z* score, compared with no feeding and speech therapy (standardized mean difference: 0.01 SD lower; 95% CI: 0.29 SD lower to 0.26 SD higher).[85,86]

Bithoney et al also suggested that children treated at a multidisciplinary growth clinic experienced an increase in weight gain when assessed with a growth quotient compared with children treated at a primary care clinic, but the evidence is very uncertain (MD: 0.57 higher; 95% CI: 0.44 higher to 0.7 higher).[79] Additionally, low-certainty evidence suggests that feeding and speech therapy increase height as assessed using a *z* score compared with no feeding and speech therapy (MD: 0.09 SD higher; 95% CI: 0.18 lower to 0.37 higher).[85,86]

Raynor et al suggested that feeding and speech therapy may increase the number of children who received greater than 85% of the expected average requirement for energy on the basis of age, compared with no feeding and speech therapy. The evidence is very uncertain, however (relative risk: 1.17; 95% CI: 0.86–1.59).[86] Black et al and Raynor et al reported that home visitor care resulted in an increase in cognitive development (MD: 3.67 higher; 95% CI: 1.8 lower to 9.14 higher) and motor development (MD: 1.57 higher; 95% CI: 2.56 lower to 5.69 higher), compared with children who only received care in a primary care clinic (low certainty evidence).[85,86]

Harms

No included studies reported on the undesirable effects of feeding and speech therapy in children with faltering weight. However, the Guideline Panel discussed potential harms, including time and costs related to additional therapies, a potential delay in care, and caregiver anxiety.

Overall, the certainty of the evidence is very low because of very serious concerns of risk of bias, imprecision, and indirectness.

Additional details regarding the results informing this recommendation are available in Appendix B, Table 11.

Other EtD Criteria and Considerations

Multiple medical and ancillary specialists are needed to implement this recommendation. In most instances, children will be ideally served by obtaining therapy from a speech-language pathologist or occupational therapist who has training in pediatric feeding issues. Feeding therapy may benefit from input by other specialists—such as dietitians and behavioral psychologists—who may provide services either as part of a formal feeding program or otherwise. The engagement of social workers and nurses may also be necessary. Other medical specialists may also play a role in directing and assisting with these therapies through concomitant medical management. These specialists include pediatric gastroenterologists; ear, nose, and throat surgeons; pediatric pulmonologists; developmental-behavioral physicians; and pediatric neurologists.

One of the challenges for children who need these therapies is the lack of access to these services. Telehealth options for such therapies should be available and reimbursed to allow children in all areas of the country to receive feeding therapy. Additionally, the lack of feeding therapists (both speech-language pathologists and occupational therapists) and behavioral psychologists who are trained in pediatric feeding should be addressed by improving and encouraging training in these fields. Finally, because these therapies can be vital for children who need them, the need for therapies should be normalized.

The Guideline Panel discussed the importance of obtaining a complete history to identify children who could benefit from feeding and speech therapy. Although feeding and speech therapy is probably acceptable to key parties, the Guideline Panel discussed important considerations that may affect its feasibility. There are moderate direct and indirect costs associated with feeding and speech

therapy stemming from factors that include insurance coverage, supplemental interventions, and transportation. There are important tradeoffs for parents and caregivers, because feeding therapy requires significant time commitments and feasibility may depend on parental availability. More importantly, as noted, there is limited access to feeding and speech therapy providers across the United States.

The Guideline Panel emphasized the need for a concerted effort to increase the number of speech-language pathologists and occupational therapists trained in pediatric dysphagia and pediatric feeding disorders and telehealth options to increase accessibility for those in rural settings. Attention to issues that affect equitable access to care is also needed, to ensure that all children who need services can access them.

Additional details regarding the EtD framework for this recommendation are available in Appendix B, Table 12.

IMPLEMENTATION CONSIDERATIONS

As with any CPG, barriers to implementation need to be considered. Awareness of the guideline, time and resources to implement the recommendations, resistance to change, and biases are common barriers among health care clinicians. Each of these barriers can be addressed through thoughtful implementation.

Children and their caregivers may face barriers as well, such as access to nutritious food, limited health care availability in their community, low health literacy, and SES-related challenges. Clinicians will need to be cognizant of these barriers when diagnosing and treating a child with faltering weight.

It is essential to educate key partners of both the name change from "failure to thrive" to "faltering weight" and the change in diagnostic criteria (specifically, the use of *z* scores). Educating clinicians, the health care team, patients, and their families will be part of the implementation process. Using all available and multidisciplinary resources will be key to guideline implementation as well as to the successful diagnosis and treatment of children with faltering weight. Dietitians and social workers, specifically, will have unique input and insight into caring for children with faltering weight and should be included in CPG implementation whenever possible.

Changes in EHR systems will be vital to the seamless implementation of this guideline. Health care professionals are encouraged to work with their EHR systems to ensure that *z* scores for weight and BMI are automatically computed by the system (as well as for height and head circumference). Billing codes for faltering weight will need to be available for clinicians, billers, and coders to use. It may be helpful for EHR systems to identify patients who meet faltering weight criteria, possibly by highlighting entered weights with different colors or by other means of clinical decision support.

An Implementation Toolkit (https://www.aap.org/en/patient-care/clinical-practice-guidelines-for-diagnosis-and-management-of-faltering-weight/) has been created in tandem with this CPG to help overcome barriers to its implementation. The Toolkit will help clinicians understand the name change, the use of *z* scores, and the CPG's Key Action Statements. The Toolkit includes information for patients and caregivers as well as guidance for clinicians who are describing the diagnosis of faltering weight to patients and their caregivers. An algorithm is provided in this CPG to assist with the diagnostic and management process. Inclusion of the algorithm in EHRs and other educational supports will help reduce time and resource barriers. The Toolkit also includes a key driver diagram and metrics to use during implementation (see Figure 1).

Quality improvement initiatives that provide maintenance of certification credit will help clinicians become aware of this CPG and allow them to implement its recommendations efficiently and consistently. The inclusion of faltering weight in other CME and maintenance of certification activities will also help eliminate barriers to implementation.

It will also be necessary to implement local and federal policies that support changes to the EHR (eg, *z* score inclusion), make changes to the billing codes, and ensure payment for clinicians who care for children with faltering weight. These actions are requisite to reducing barriers to guideline implementation.

Barriers to the treatment and monitoring of children with faltering weight will also need to be addressed. The first-line treatment for any child with faltering weight will be to increase energy/calories consumed. High-calorie/high-energy beverages should be made available to families whenever faltering weight is accompanied by pediatric feeding disorder.

It will be essential for clinicians to assist caregivers in determining how best to meet this goal. A clinician or other team member will need to educate caregivers on how to increase energy/calories and determine how this will be monitored in different settings (eg, home, school, or childcare). Ideally, the clinician or other team member will estimate the current caloric intake by comparing the child's consumption (either observed or recorded) with age- and sex-based energy requirements. Strategies to increase calories include mixing formula or human milk to a higher-calorie concentration, mixing baby cereals with infant formula or human milk instead of water, and using calorically dense additives (such as oil, avocado, cream, butter, peanut butter, other nut butters, etc). See information in the Implementation Toolkit to aid with this process.

RESEARCH PRIORITIES

There is a profound lack of evidence surrounding most issues that concern faltering weight. In addition, there is

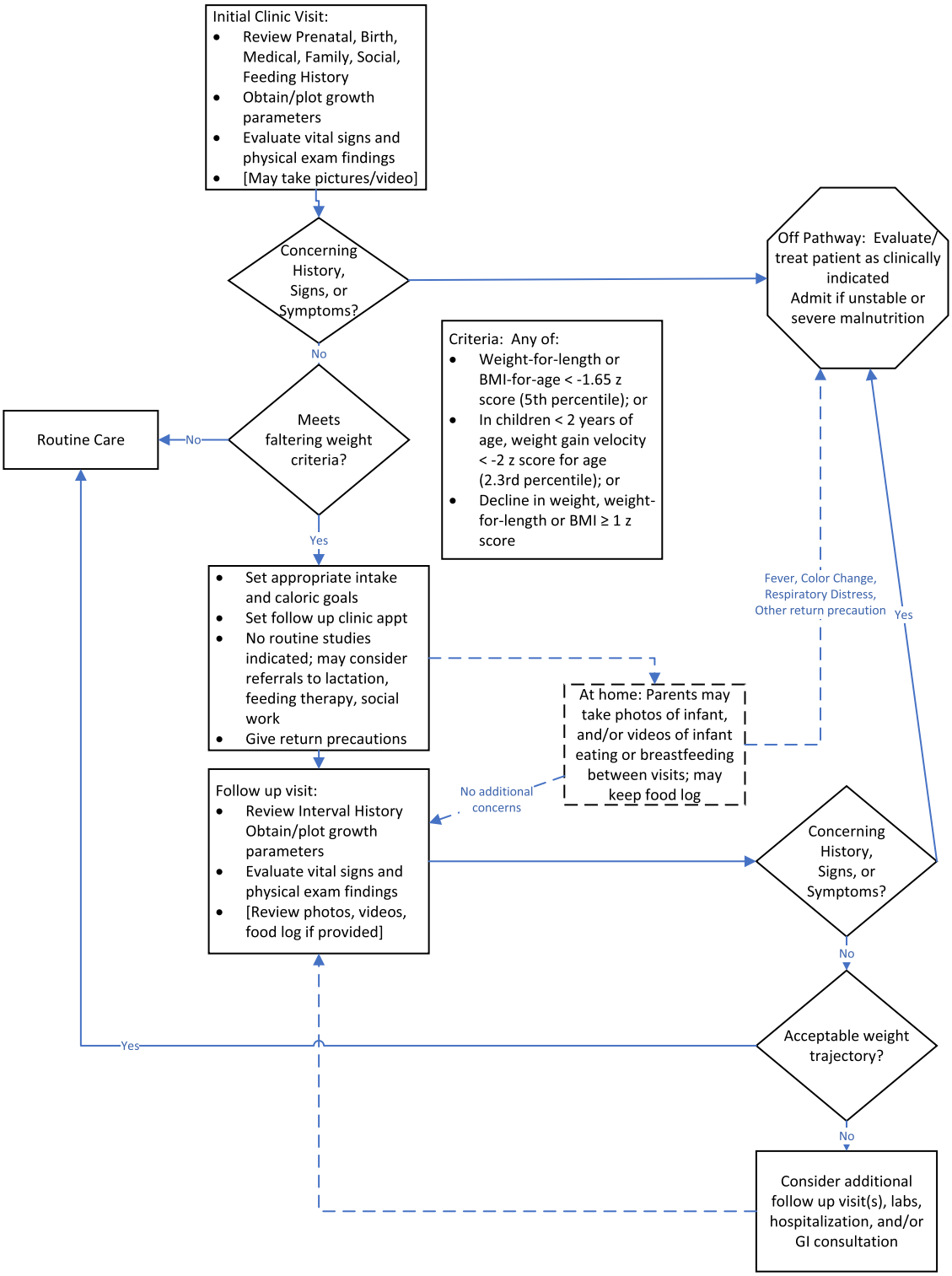

FIGURE 1.
Diagnosis and treatment of faltering weight.

also a lack of large, prospective studies—especially studies conducted in the primary care setting. As a result, this CPG's systematic review—as well as the KASs that stem from it—live with a lack of evidence.

Studies on faltering weight should ideally be conducted in the primary care setting except for studies that are directly pertinent to hospitalization or subspecialists. There is also a need for additional studies (particularly for large prospective studies) conducted in high-resource countries to answer questions about diagnosis, evaluation, and treatment. Smaller cohort studies and/or RCTs are also needed to address more specific questions in subsets of children with faltering weight.

Research is needed to validate the Guideline Panel's definition of faltering weight. The Guideline Panel reviewed a number of resources when determining the new definition but did not reach a unanimous consensus. Prospectively identified patients who do and do not meet the provided definition can help further refine the definition in future revisions of this CPG.

There is also the concern that several aspects of RCTs conducted on children with faltering weight may be unethical. For example, the question of whether increased energy/calories and/or high-calorie oral supplements should be used for children with faltering weight is ethically impossible to study in a randomized fashion. Nuanced approaches such as comparative studies with different forms of calorie supplementation may be necessary and should address the weight gain/growth in children who are provided higher energy through energy supplements (eg, mixed in food) vs higher-calorie formulas.

Other factors related to caloric supplementation that need to be investigated include the timelines during which increased calories are needed and are most beneficial for children with faltering weight. Although the immediate impact of increased caloric intake is likely to be improved weight gain, the long-term impacts of such calorie augmentation should be researched, with regard to both likely positive outcomes (eg, improved development) and potential negative outcomes (eg, cardiovascular sequelae). Finally, the role of early calorie supplementation in reducing downstream costs of care should also be researched.

The question of whether endoscopy should be used for children with faltering weight needs to be addressed in prospective studies. Although RCTs are ideal, observational studies should help advance the understanding of when endoscopy is necessary. In such studies, all children with faltering weight could be clearly categorized and the endoscopy and biopsies assessed with respect to whether the results changed the therapy used.

The true prevalence of conditions that present with faltering weight is unclear. They have primarily been assessed in specialty clinics where prevalence is likely higher because of the study population. Large-population cohorts may help answer this question and inform whether it is helpful to perform additional studies, such as RCTs, to randomize children to early vs later diagnostic testing.

Similarly, the question of whether therapy for feeding difficulties should be used for children with faltering weight who have documented feeding issues can also be explored through randomization/wait control. Children in whom feeding difficulties are diagnosed should undergo specific forms of feeding therapy and their outcomes should be compared for improvement in oral skills, oral intake, and, ultimately, growth outcomes. This research also needs to be conducted with various forms of feeding therapy. Once a few candidate therapies are available, RCTs can be used to compare these therapies head-to-head.

Finally, there are pending questions about faltering weight in immigrant communities. It is not known what proportion of young immigrant children and children of immigrants show growth faltering when they come to the United States and/or present for health care. Whether these children experienced preexisting primary macro- or micronutrient malnutrition or a preexisting chronic illness is also not known. There is a benefit to examining whether rates of faltering weight differ by country of origin, by the parent's country of origin, or by other characteristics within immigrant populations.

The identified research priorities will answer the questions that were initially proposed by this systematic review with firmer evidence gathered from high-quality studies.

CONCLUSION

This CPG renames the condition formerly called "failure to thrive" as "faltering weight." It also standardizes diagnostic criteria and proposes initial management for this condition as well as an equitable approach. Because this CPG was codeveloped with NASPGHAN, it also provides guidance regarding considerations for endoscopy in children with faltering weight.

Challenges remain regarding the adoption of this CPG, and doing so will require changes in EHRs and, potentially, in office procedures. Education of patients, families, pediatricians, and the health care team—along with enhanced information technology solutions—will be needed to help translate these recommendations into clinical practice.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
BMI: body mass index
CDC: Centers for Disease Control and Prevention
CPG: clinical practice guideline
EHR: electronic health record
EtD: evidence-to-decision
FTT: failure to thrive
GERD: gastroesophageal reflux disease
GRADE: Grading of Recommendations Assessment, Development, and Evaluation
KAS: Key Action Statement
NASPGHAN: North American Society for Pediatric Gastroenterology, Hepatology and Nutrition
PHCP: pediatric health care provider
PICO: population, intervention, comparator, and outcome
RCT: randomized controlled trial
SES: socioeconomic status
WIC: Special Supplemental Nutrition Program for Women, Infants, and Children
UK: United Kingdom
WHO: World Health Organization

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The guidance in this statement does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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REFERENCES

1. Andrews JC, Schünemann HJ, Oxman AD, et al. GRADE guidelines: 15. Going from evidence to recommendation-determinants of a recommendation's direction and strength. *J Clin Epidemiol*. 2013;66(7):726–735. PubMed doi: 10.1016/j.jclinepi.2013.02.003
2. Alexander PE, Brito JP, Neumann I, et al. World Health Organization strong recommendations based on low-quality evidence (study quality) are frequent and often inconsistent with GRADE guidance. *J Clin Epidemiol*. 2016;72:98–106. PubMed doi: 10.1016/j.jclinepi.2014.10.011
3. Centers for Disease Control and Prevention. *National Health and Nutrition Examination Survey (NHANES): Anthropometry Procedures Manual*. Centers for Disease Control and Prevention; 2021. Accessed March 31, 2025. https://wwwn.cdc.gov/nchs/data/nhanes/public/2021/manuals/2021-Anthropometry-Procedures-Manual-508.pdf
4. Schwartz ID. Failure to thrive: an old nemesis in the new millennium. *Pediatr Rev*. 2000;21(8):257–264. PubMed doi: 10.1542/pir.21.8.257
5. Jaffe AC. Failure to thrive: current clinical concepts. *Pediatr Rev*. 2011;32(3):100–107. PubMed doi: 10.1542/pir.32.3.100
6. Berwick DM, Levy JC, Kleinerman R. Failure to thrive: diagnostic yield of hospitalisation. *Arch Dis Child*. 1982;57(5):347–351. PubMed doi: 10.1136/adc.57.5.347
7. National Guideline Alliance (UK). Faltering growth–recognition and management. National Institute for Health and Care Excellence; 2017 Sep. NICE Guideline, No. 75. Accessed July 22, 2023. https://www.ncbi.nlm.nih.gov/books/NBK458459/
8. Olsen EM, Petersen J, Skovgaard AM, Weile B, Jørgensen T, Wright CM. Failure to thrive: the prevalence and concurrence of anthropometric criteria in a general infant population. *Arch Dis Child*. 2007;92(2):109–114. PubMed doi: 10.1136/adc.2005.080333
9. World Health Organization. *Guideline: Updates on the Management of Severe Acute Malnutrition in Infants and Children*. World Health Organization; 2013.
10. Mei Z, Grummer-Strawn LM. Comparison of changes in growth percentiles of US children on CDC 2000 growth charts with corresponding changes on WHO 2006 growth charts. *Clin Pediatr (Phila)*. 2011;50(5):402–407. PubMed doi: 10.1177/0009922810392774
11. Cooke R, Goulet O, Huysentruyt K, et al. Catch-up growth in infants and young children with faltering growth: expert opinion to guide general clinicians. *J Pediatr Gastroenterol Nutr*. 2023;77(1):7–15. PubMed doi: 10.1097/MPG.0000000000003784
12. Hulst JM, Huysentruyt K, Gerasimidis K, et al; Special Interest Group Clinical Malnutrition of ESPGHAN. A practical approach to identifying pediatric disease-associated undernutrition: a position statement from the ESPGHAN Special Interest Group on Clinical Malnutrition. *J Pediatr Gastroenterol Nutr*. 2022;74(5):693–705. PubMed doi: 10.1097/MPG.0000000000003437
13. Langer G, Meerpohl JJ, Perleth M, Gartlehner G, Kaminski-Hartenthaler A, Schünemann H. [GRADE guidelines: 1. Introduction - GRADE evidence profiles and summary of findings tables]. *Z Evid Fortbild Qual Gesundhwes*. 2012;106(5):357–368. PubMed doi: 10.1016/j.zefq.2012.05.017
14. Guyatt GH, Oxman AD, Vist GE, et al; GRADE Working Group. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008;336(7650):924–926. PubMed doi: 10.1136/bmj.39489.470347.AD
15. Schünemann HJ, Wiercioch W, Brozek J, et al. GRADE Evidence to Decision (EtD) frameworks for adoption, adaptation, and de novo development of trustworthy recommendations: GRADE-ADOLOPMENT. *J Clin Epidemiol*. 2017;81:101–110. PubMed doi: 10.1016/j.jclinepi.2016.09.009
16. Schünemann HJ, Wiercioch W, Etxeandia I, et al. Guidelines 2.0: systematic development of a comprehensive checklist for a successful guideline enterprise. *CMAJ*. 2014;186(3):E123–E142. PubMed doi: 10.1503/cmaj.131237
17. Schünemann HJ, Al-Ansary LA, Forland F, et al; Board of Trustees of the Guidelines International Network. Guidelines International Network: principles for disclosure of interests and management of conflicts in guidelines. *Ann Intern Med*. 2015;163(7):548–553. PubMed doi: 10.7326/M14-1885
18. Graham R, Mancher M, Miller Wolman D, et al, eds. *Clinical Practice Guidelines We Can Trust*. National Academies Press; 2011, 10.17226/13058.
19. Qaseem A, Forland F, Macbeth F, Ollenschläger G, Phillips S, van der Wees P; Board of Trustees of the Guidelines International

Network. Guidelines International Network: toward international standards for clinical practice guidelines. *Ann Intern Med.* 2012; 156(7):525–531. PubMed doi: 10.7326/0003-4819-156-7-201204030-00009

20. Lo B, Field MJ, eds. *Conflict of Interest in Medical Research, Education, and Practice*. National Academies Press (US); 2009. doi: 10.17226/12598
21. AlShenaiber L, Senerth E, Babatunde I, et al. The impact of socioeconomic status and different treatment modalities on children with faltering weight: results of four technical reviews: Technical report. *Pediatrics.* 2026;157(4):e2025076121. PubMed doi: 10.1542/peds.2025-076121
22. El Mikati IK, Ibrahimi NI, Alshorman A, et al. The benefits and harms of endoscopy and other diagnostic tests to detect underlying conditions in children with faltering weight: results of two technical reviews: Technical report. *Pediatrics.* 2026;157(4): e2025076121. PubMed doi: 10.1542/peds.2025-076120
23. Guyatt GH, Oxman AD, Kunz R, et al. GRADE guidelines: 2. Framing the question and deciding on important outcomes. *J Clin Epidemiol.* 2011;64(4):395–400. PubMed doi: 10.1016/j.jclinepi.2010.09.012
24. Word Bank. High Income. World Bank Open Data. Accessed July 22, 2023. https://data.worldbank.org/income-level/high-income
25. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021;372(71):n71. PubMed doi: 10.1136/bmj.n71
26. Alonso-Coello P, Oxman AD, Moberg J, et al; GRADE Working Group. GRADE Evidence to Decision (EtD) frameworks: a systematic and transparent approach to making well informed healthcare choices. 2: Clinical practice guidelines. *BMJ.* 2016;353:i2089. PubMed doi: 10.1136/bmj.i2089
27. Alonso-Coello P, Schünemann HJ, Moberg J, et al; GRADE Working Group. GRADE Evidence to Decision (EtD) frameworks: a systematic and transparent approach to making well informed healthcare choices. 1: Introduction. *BMJ.* 2016;353(353):i2016. PubMed doi: 10.1136/bmj.i2016
28. Schünemann HJ, Mustafa R, Brozek J, et al; GRADE Working Group. GRADE Guidelines: 16. GRADE evidence to decision frameworks for tests in clinical practice and public health. *J Clin Epidemiol.* 2016; 76:89–98. PubMed doi: 10.1016/j.jclinepi.2016.01.032
29. Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ.* 2019;366: l4898. PubMed doi: 10.1136/bmj.l4898
30. Sterne JA, Hernán MA, Reeves BC, et al. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ.* 2016;355:i4919. PubMed doi: 10.1136/bmj.i4919
31. Wolff RF, Moons KGM, Riley RD, et al; PROBAST Group†. PROBAST: a tool to assess the risk of bias and applicability of prediction model studies. *Ann Intern Med.* 2019;170(1):51–58. PubMed doi: 10.7326/M18-1376
32. Whiting PF, Rutjes AW, Westwood ME, et al; QUADAS-2 Group. QUADAS-2: a revised tool for the quality assessment of diagnostic accuracy studies. *Ann Intern Med.* 2011;155(8):529–536. PubMed doi: 10.7326/0003-4819-155-8-201110180-00009
33. Atkins D, Eccles M, Flottorp S, et al; GRADE Working Group. Systems for grading the quality of evidence and the strength of recommendations I: critical appraisal of existing approaches The GRADE Working Group. *BMC Health Serv Res.* 2004;4(1):38. PubMed doi: 10.1186/1472-6963-4-38
34. Bro ek J, Nowak A, Kunstman P, Schünemann HJ. GRADEpro Guideline Development Tool (G2DT) Computer Program Version 2.xx. 2014. Accessed March 31, 2025. http://www.guidelinedevelopment.org
35. Bradley RH, Corwyn RF. Socioeconomic status and child development. *Annu Rev Psychol.* 2002;53(1):371–399. PubMed doi: 10.1146/annurev.psych.53.100901.135233
36. Poulain T, Vogel M, Kiess W. Review on the role of socioeconomic status in child health and development. *Curr Opin Pediatr.* 2020; 32(2):308–314. PubMed doi: 10.1097/MOP.0000000000000876
37. Blair PS, Drewett RF, Emmett PM, Ness A, Emond AM. Family, socioeconomic and prenatal factors associated with failure to thrive in the Avon Longitudinal Study of Parents and Children (ALSPAC). *Int J Epidemiol.* 2004;33(4):839–847. PubMed doi: 10.1093/ije/dyh100
38. Wright CM, Parkinson KN, Drewett RF. The influence of maternal socioeconomic and emotional factors on infant weight gain and weight faltering (failure to thrive): data from a prospective birth cohort. *Arch Dis Child.* 2006;91(4):312–317. PubMed doi: 10.1136/adc.2005.077750
39. Olsen EM, Skovgaard AM, Weile B, Petersen J, Jørgensen T. Risk factors for weight faltering in infancy according to age at onset. *Paediatr Perinat Epidemiol.* 2010;24(4):370–382. PubMed doi: 10.1111/j.1365-3016.2010.01118.x
40. Edwards B, Schaefer EW, Murray-Kolb LE, Daymont C. Evaluation of income and food insecurity as risk factors for failure to thrive: an analysis of national survey data. *Clin Pediatr (Phila).* 2023;62(8): 862–870. PubMed doi: 10.1177/00099228221150705
41. Kachi Y, Fujiwara T, Yamaoka Y, Kato T. Parental socioeconomic status and weight faltering in infants in Japan. *Front Pediatr.* 2018; 6:127. PubMed doi: 10.3389/fped.2018.00127
42. Harris J, Nisbett N. The basic determinants of malnutrition: resources, structures, ideas and power. *Int J Health Policy Manag.* 2021;10(12):817–827. PubMed doi: 10.34172/ijhpm.2020.259
43. Hampl SE, Hassink SG, Skinner AC, et al. Clinical practice guideline for the evaluation and treatment of children and adolescents with obesity. *Pediatrics.* 20231;151(2):e2022060640. DOI: https://doi.org/10.1542/peds.2022-060640.
44. Siddiqui F, Salam RA, Lassi ZS, Das JK. The intertwined relationship between malnutrition and poverty. *Front Public Health.* 2020;8:453. PubMed doi: 10.3389/fpubh.2020.00453
45. Alvear-Vega S, Vargas-Garrido H. Social determinants of malnutrition in Chilean children aged up to five. *BMC Public Health.* 2022; 22(1):44. PubMed doi: 10.1186/s12889-021-12455-4
46. Brown JE, Serdula M, Cairns K, et al. Ethnic group differences in nutritional status of young children from low-income areas of an urban county. *Am J Clin Nutr.* 1986;44(6):938–944. PubMed doi: 10.1093/ajcn/44.6.938

47. Tang MN, Adolphe S, Rogers SR, Frank DA. Failure to thrive or growth faltering: medical, developmental/behavioral, nutritional, and social dimensions. *Pediatr Rev.* 2021;42(11):590–603. PubMed doi: 10.1542/pir.2020-001883

48. Food Research and Action Center. Accessed March 31, 2025. http://www.FRAC.org

49. National Cancer Institute. *NCI Dictionary of Cancer Terms: Patient Navigator*. Accessed March 31, 2025. https://www.cancer.gov/publications/dictionaries/cancer-terms/def/patient-navigator

50. Frank DA, Rogers S. Failure to thrive and population health: the impact of disparities and social determinants. In: Vachani JG, ed. *Failure to Thrive and Malnutrition: A Practical, Evidence-Based Clinical Guide*. Springer Nature Switzerland AG; 2023:103–142.

51. Kenyon CC, McPeak KE, Fiks AG. Improving child health care outcomes through social needs intervention-a Signal. *JAMA Netw Open*. 2020;3(6):e206456. PubMed doi: 10.1001/jamanetworkopen.2020.6456

52. Kalaman CR, Ibrahim N, Shaker V, et al. Parental factors associated with child or adolescent medication adherence: a systematic review. *Healthcare (Basel)*. 2023;11(4):501. PubMed doi: 10.3390/healthcare11040501

53. Barker DH, Quittner AL. Parental depression and pancreatic enzymes adherence in children with cystic fibrosis. *Pediatrics*. 2016;137(2):e20152296. PubMed doi: 10.1542/peds.2015-2296

54. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Arch Intern Med*. 2000;160(14):2101–2107. PubMed doi: 10.1001/archinte.160.14.2101

55. Goldberg DL, Becker PJ, Brigham K, et al. Identifying malnutrition in preterm and neonatal populations: recommended indicators. *J Acad Nutr Diet*. 2018;118(9):1571–1582. PubMed doi: 10.1016/j.jand.2017.10.006

56. Becker P, Carney LN, Corkins MR, et al; Academy of Nutrition and Dietetics; American Society for Parenteral and Enteral Nutrition. Consensus statement of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition: indicators recommended for the identification and documentation of pediatric malnutrition (undernutrition). *Nutr Clin Pract*. 2015;30(1):147–161. PubMed doi: 10.1177/0884533614557642

57. Puls HT, Plencner L, Krager M, Frazier TN, Hall M, Bettenhausen JL. The diagnostic accuracy of inhospital weight gain for differentiating neglect from other failure to thrive etiologies. *Hosp Pediatr*. 2018;8(10):620–627. PubMed doi: 10.1542/hpeds.2018-0035

58. Sills RH. Failure to thrive. The role of clinical and laboratory evaluation. *AJDC*. 1978;132(10):967–969. PubMed doi: 10.1001/archpedi.1978.02120350031003

59. Moy L, Levine J. Capsule endoscopy in the evaluation of patients with unexplained growth failure. *J Pediatr Gastroenterol Nutr*. 2009;48(5):647–650. PubMed doi: 10.1097/MPG.0b013e31818b0ac7

60. Larson-Nath CM, Goday PS. Failure to thrive: a prospective study in a pediatric gastroenterology clinic. *J Pediatr Gastroenterol Nutr*. 2016;62(6):907–913. PubMed doi: 10.1097/MPG.0000000000001099

61. Larson-Nath C, St Clair N, Goday P. Hospitalization for failure to thrive: a prospective descriptive report. *Clin Pediatr (Phila)*. 2018;57(2):212–219. PubMed doi: 10.1177/0009922817698803

62. Adedoyin O, Gottlieb B, Frank R, et al. Evaluation of failure to thrive: diagnostic yield of testing for renal tubular acidosis. *Pediatrics*. 2003;112(6 Pt 1):e463–e466. PubMed doi: 10.1542/peds.112.6.e463

63. Casey PH, Wortham B, Nelson JY. Management of children with failure to thrive in a rural ambulatory setting. Epidemiology and growth outcomes. *Clin Pediatr (Phila)*. 1984;23(6):325–330. PubMed doi: 10.1177/000992288402300604

64. Mold JW, Stein HF. The cascade effect in the clinical care of patients. *N Engl J Med*. 1986;314(8):512–514. PubMed doi: 10.1056/NEJM198602203140809

65. Fachler T, Shteyer E, Orlanski Meyer E, et al. Pediatric gastrointestinal endoscopy: diagnostic yield and appropriateness of referral based on clinical presentation: a pilot study. *Front Pediatr*. 2021;9:607418. PubMed doi: 10.3389/fped.2021.607418

66. Alabd Alrazzak B, Husien T, Preston DL, Elitsur Y. Upper endoscopy in children: do symptoms predict positive findings? *Clin Pediatr (Phila)*. 2014;53(5):474–478. PubMed doi: 10.1177/0009922814528034

67. Quak SH, Lam SK, Low PS. Upper gastrointestinal endoscopy in children. *Singapore Med J*. 1990;31(2):123–126. PubMed

68. Helin N, Kolho KL, Rintala R, Merras-Salmio L. Upper endoscopy for non-acute non-specific symptoms is seldom beneficial for children under the age of seven. *Acta Paediatr*. 2020;109(4):827–835. PubMed doi: 10.1111/apa.15027

69. Sheiko MA, Feinstein JA, Capocelli KE, Kramer RE. Diagnostic yield of EGD in children: a retrospective single-center study of 1000 cases. *Gastrointest Endosc*. 2013;78(1):47–54.e1. PubMed doi: 10.1016/j.gie.2013.03.168

70. Davidson BR, Hurd DM, Johnstone MS. Nissen fundoplication and pyloroplasty in the management of gastro-oesophageal reflux in children. *Br J Surg*. 1987;74(6):488–490. PubMed doi: 10.1002/bjs.1800740621

71. Tori AJ, Carroll AE, Gupta SK. Disaccharidase activity in infants and comparison based on symptoms and histological changes. *J Pediatr Gastroenterol Nutr*. 2007;45(2):194–198. PubMed doi: 10.1097/MPG.0b013e31804c98cc

72. Biber JL, Allareddy V, Allareddy V, et al. Prevalence and predictors of adverse events during procedural sedation anesthesia-outside the operating room for esophagogastroduodenoscopy and colonoscopy in children: age is an independent predictor of outcomes. *Pediatr Crit Care Med*. 2015;16(8):e251–e259. PubMed doi: 10.1097/PCC.0000000000000504

73. McCann ME, de Graaff JC, Dorris L, et al; GAS Consortium. Neurodevelopmental outcome at 5 years of age after general anaesthesia or awake-regional anaesthesia in infancy (GAS): an international, multicentre, randomised, controlled equivalence trial. *Lancet*. 2019;393(10172):664–677. PubMed doi: 10.1016/S0140-6736(18)32485-1

74. Kramer RE, Narkewicz MR. Adverse events following gastrointestinal endoscopy in children: classifications, characterizations, and implications. *J Pediatr Gastroenterol Nutr*. 2016;62(6):828–833. PubMed doi: 10.1097/MPG.0000000000001038

75. Rosenblatt A, Kremer M, Swanson B, Shah R. Anesthesia exposure in the young child and long-term cognition: an integrated review. *AANA J*. 2019;87(3):231–242. PubMed

76. Hoddinott J, Behrman JR, Maluccio JA, et al. Adult consequences of growth failure in early childhood. *Am J Clin Nutr*. 2013;98(5):1170–1178. PubMed doi: 10.3945/ajcn.113.064584

77. Fink G, Rockers PC. Childhood growth, schooling, and cognitive development: further evidence from the Young Lives study. *Am J Clin Nutr*. 2014;100(1):182–188. PubMed doi: 10.3945/ajcn.113.080960

78. Crookston BT, Schott W, Cueto S, et al. Postinfancy growth, schooling, and cognitive achievement: Young Lives. *Am J Clin Nutr*. 2013;98(6):1555–1563. PubMed doi: 10.3945/ajcn.113.067561

79. Bithoney WG, McJunkin J, Michalek J, Snyder J, Egan H, Epstein D. The effect of a multidisciplinary team approach on weight gain in nonorganic failure-to-thrive children. *J Dev Behav Pediatr*. 1991;12(4):254–258. PubMed doi: 10.1097/00004703-199108000-00007

80. Khoshoo V, Reifen R. Use of energy-dense formula for treating infants with non-organic failure to thrive. *Eur J Clin Nutr*. 2002;56(9):921–924. PubMed doi: 10.1038/sj.ejcn.1601406

81. O'Reilly M, Boland S, Slattery D, Ward F. A prospective, randomised, open labelled trial to examine the clinical efficacy of an oral nutritional supplement with regards to improving the nutritional status of undernourished children (2–10 years) in the hospital and community setting over 6 weeks. *Clin Nutr ESPEN*. 2015;10(5):e202–e203. PubMed doi: 10.1016/j.clnesp.2015.03.060

82. Zhang Z, Li F, Hannon BA, et al. Effect of oral nutritional supplementation on growth in children with undernutrition: a systematic review and meta-analysis. *Nutrients*. 2021;13(9):3036. PubMed doi: 10.3390/nu13093036

83. Cawood AL, Smith C, Kinnear FJ, et al. Effect of oral nutritional supplements on outcomes in children presenting with, or at risk of, faltering growth in clinical settings: A systematic review and meta-analysis. *J Child Health Care*. 2025;29(1):222–244. PubMed doi: 10.1177/13674935231185181

84. Arvedson J, Clark H, Lazarus C, Schooling T, Frymark T. The effects of oral-motor exercises on swallowing in children: an evidence-based systematic review. *Dev Med Child Neurol*. 2010;52(11):1000–1013. PubMed doi: 10.1111/j.1469-8749.2010.03707.x

85. Black MM, Dubowitz H, Hutcheson J, Berenson-Howard J, Starr RH Jr. A randomized clinical trial of home intervention for children with failure to thrive. *Pediatrics*. 1995;95(6):807–814. PubMed doi: 10.1542/peds.95.6.807

86. Raynor P, Rudolf MC, Cooper K, Marchant P, Cottrell D, Blair M. A randomised controlled trial of specialist health visitor intervention for failure to thrive. *Arch Dis Child*. 1999;80(6):500–506. PubMed doi: 10.1136/adc.80.6.500

87. Wright CM, Callum J, Birks E, Jarvis S. Effect of community based management in failure to thrive: randomised controlled trial. *BMJ*. 1998;317(7158):571–574. PubMed doi: 10.1136/bmj.317.7158.571