

Review

Evaluation and Management of Pediatric Feeding Disorder

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Abstract: Feeding disorders are increasingly common in children, especially as medical advancements improve the life expectancy of children born with prematurity and complex medical conditions. The most common symptoms include malnutrition, refusal to eat and drink, food pocketing, disruptive feeding behavior, slow feeding, food selectivity or rigid food preferences, limited appetite, and delayed feeding milestones. A unifying diagnostic definition of pediatric feeding disorder has been proposed by a panel of experts to improve the quality of health care and advance research. Referral to specialized care should be considered when feeding problems are complex or difficult to resolve. In this review, we provide an overview of the evaluation and management of pediatric feeding disorders and information that may be useful when considering whether referral to specialized care may be beneficial.

Keywords: feeding disorder; children; management



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1. Introduction

Feeding is an extremely complex process. It requires several systems to interact, namely the central and peripheral nervous systems, oropharyngeal mechanism, cardiopulmonary system, and gastrointestinal (GI) tract, and is supported by craniofacial structures and the musculoskeletal system. In addition to these physiological factors of feeding, cultural background is a critical yet commonly overlooked aspect of feeding. For example, there are particular tastes and activities associated with meals that are unique to a family unit and are dependent on the family's history and experiences [1]. Furthermore, children have individual taste and texture preferences that often change as they mature [2]. When any of these factors are disrupted, the risk of a child developing a feeding disorder and associated complications increases. In reality, multiple factors are often disrupted in children, resulting in the development and persistence of feeding disorders.

2. Pediatric Feeding Disorder (PFD)

Feeding disorders are often observed in the first one to three years of life when a child has poor weight gain, decreased oral intake, and/or delayed development of feeding skills. The most common symptoms include malnutrition, refusal to eat and drink, food pocketing, disruptive feeding behavior, slow feeding (>30 min to finish), food selectivity or rigid food preferences, limited appetite, and delayed feeding milestones. Feeding disorders are relatively common, occurring in up to 45% of children in the general population [3,4], and in up to 80% of children with developmental disabilities and complex medical conditions [5–7]. Feeding disorders are chronic conditions that tend to worsen over time [8,9]. It has also been found that feeding disorders in early childhood are predictive of symptoms of bulimia nervosa and anorexia nervosa in adolescence [10]. The prevalence of feeding disorders continues to increase as medical advancements improve the life expectancy of infants and children born with prematurity, low birth weight, and complex medical conditions [11,12].

Previous descriptions of pediatric feeding disorder (PFD) did not include the functional limitations that these patients with this condition experience [13]. PFD had previously been described as organic versus non-organic or focused on a single system or diagnosis [14,15]. In 2019, an expert group published a consensus definition of PFD, which

recognized functional impairment in the diagnosis of PFD, based on the World Health Organization's (WHO) International Classification of Functioning, Disability, and Health [16]. In this new consensus definition, PFD is defined as impaired oral intake that is not age appropriate and is associated with at least one dysfunctional domain: medical; nutritional; feeding skills; and psychosocial (Table 1). Symptoms of PFD must be present daily for at least two weeks. In acute PFD, symptoms are present for less than three months, and in chronic PFD, symptoms persist for longer than three months. The new definition allows for a unified and consistent approach to identifying patients affected by PFD.

Table 1. Diagnostic criteria for Pediatric Feeding Disorder.

A. A Disturbance in Oral Intake of Nutrients, Inappropriate for Age, Lasting at Least Two Weeks, and Associated with One or More of the Following:	
Medical dysfunction	Cardiorespiratory compromise during oral feeding Aspiration or recurrent aspiration pneumonitis
Nutritional dysfunction	Malnutrition Specific nutrient deficiency or significantly restricted intake of one or more nutrients resulting from decreased dietary diversity Reliance on enteral feeds or oral supplements to sustain nutrition and/or hydration
Feeding skill dysfunction	Need for texture modification of liquid or food Use of modified feeding position or equipment Use of modified feeding strategies
Psychosocial dysfunction	Active or passive avoidance behaviors by child when feeding or being fed Inappropriate caregiver management of child's feeding and/or nutrition needs Disruption of social functioning within a feeding context Disruption of caregiver-child relationship associated with feeding
B. Absence of the cognitive processes consistent with eating disorders and pattern of oral intake is not due to a lack of food or congruent with cultural norms.	

The definition of PFD specifies four domains: medical; nutritional; feeding skills; and psychosocial. The medical domain includes anatomical, neurological, and developmental issues that may lead to PFD. The impairments related to medical conditions give rise to dysfunction through several mechanisms, including aspiration, upper GI tract dysfunction or inflammation, and delayed acquisition of feeding skills. Diseases commonly associated with PFD are shown in Table 2.

The nutritional domain of PFD includes altered intake that affects nutritional status. Malnutrition affects 25–50% of children with PFD [17,18] and is most prevalent among those with chronic diseases or neurodevelopmental disorders [19]. Factors such as restricted quality, quantity, and variety of foods and beverages consumed can result in dehydration, malnutrition, overnutrition, and micronutrient deficiency or toxicity.

The feeding skills domain refers to a lack of development of normal feeding skills that may be attributable to a medical issue or an adverse or delayed feeding exposure. A neurodevelopmental delay that inhibits feeding may become evident any time in the first few years of life, during periods of change in oropharyngeal anatomy and neuromuscular coordination, or during transitions in texture or feeding and/or drinking utensils [20,21]. Specific impairments in oral and pharyngeal sensory-motor functioning may also inhibit feeding skills. In addition, altered oral experiences due to physical injury, deficits in neurological functioning [22], abnormal oral structure or function [23], and/or adverse or limited feeding experiences [24–27] can lead to impaired feeding skills.

The psychosocial domain includes the complex interactions between a child and their caregivers and their overall social situation. Psychosocial dysfunction can result from a mismatch between the abilities of the child and the expectations of caregivers, the child's or a caregiver's mental and behavioral health problems, social influences (e.g., cultural

expectations), and environmental factors, such as a distracting feeding environment, an inconsistent mealtime schedule, and unavailability of food resources.

In some children, PFD is attributable to sensory issues. They limit their intake based on the smell, taste, texture, appearance, or temperature of the offered food [28]. This behavior can range from being described as picky eating, which does not qualify as a feeding disorder, to malnutrition due to extremely limited intake. Many children are also reluctant to try something new, which may not be a feeding disorder. Selective eating behavior is correlated with sensory sensitivity and is also a component of anxiety [29]. Thus, children with these issues encompass a blend of medical and psychosocial domains. The approach to these issues is normally multidisciplinary, with behavioral and/or nutritional interventions.

Table 2. Medical conditions associated with Pediatric Feeding Disorder.

System	Diseases
Oral, nasal, or pharyngeal disorders	Cleft lip, cleft palate Macroglossia Micrognathia Cranio-facial syndromes Extensive dental disease Choanal atresia Chronic tonsillitis
Aerodigestive disease	
Airway	Laryngeal clefts Vocal cord/vocal fold paralysis Laryngomalacia, tracheomalacia Subglottic stenosis Reactive airway disease
Gastrointestinal	Food allergies and food intolerances Eosinophilic esophagitis Esophageal motility disorder (post-esophageal atresia or achalasia) Short bowel syndrome Feeding/volume intolerance of any cause Gastroparesis Gastroesophageal reflux disease Congenital anomalies of GI tract
Cardio-pulmonary disorders	Any form of congenital heart disease (esp. hypoplastic left heart syndrome) and other conditions that result in staged single ventricle repair Associated pulmonary hypertension Myocarditis and other causes of heart failure Bronchopulmonary dysplasia Chronic lung disease Any process resulting in chronic tachypnea
Neurological, neuromuscular, developmental, and psychiatric disorders	Autism spectrum disorder Disorders of motor control with hyper- or hypotonia (Cerebral palsy, Muscular dystrophies) Attention deficit/hyperactivity disorder
Iatrogenic	Prolonged hospitalization with critical care support (e.g., ventilation, continuous positive airway pressure, high-flow, oxygen) Invasive operative procedures affecting vital systems (e.g., tracheostomy, gastrostomy) Aversive feeding

PFD should be distinguished from psychiatric conditions such as eating disorders and Avoidant/Restrictive Food Intake Disorder (ARFID). Patients with an eating disorder present with body image disturbances and restriction of energy intake leading to significantly low body weight. ARFID is manifested by persistent failure to meet appropriate energy needs leading to marked interference with psychosocial functioning without body image or weight concerns.

3. Evaluation of PFD

Feeding disorders can manifest with many different signs and symptoms. Some cases are easily identified, while others are more challenging, particularly in the presence of normal growth. Unrecognized PFD can result in severe consequences, including a compromised immune system, chronic aspiration, growth failure, and death [28]. Therefore, early identification and intervention are critical.

3.1. Initial Evaluation

The initial evaluation of a feeding disorder is typically performed by the primary care practitioner. The signs and symptoms that indicate the need for more specialized assessment and intervention should be identified. Assessment of the nutritional status of the child is an important part of the feeding evaluation. The child's current weight, length or height, and head circumference should be obtained. Plotting weight-for-height or body mass index (BMI) on the growth chart gives an objective measure of the thinness of the child. Taken over time, these measurements can identify children whose growth is faltering and reflect positive changes earlier when nutritional intervention begins. Measurements for children born prematurely by four or more weeks should be age-adjusted until the child is two years old. Poor weight gain refers to failure to gain weight appropriately. The degree of acute and chronic malnutrition manifested as wasting or edema, and linear stunting, respectively, is assessed clinically using anthropometric measurements. The assessment methods are based on the assumption that weight deficits occur initially during periods of nutritional deprivation, followed by faltering linear growth and then lagging head circumference growth. Estimates of the adequacy of energy and protein intake should be routinely determined for all children, especially those at high risk for malnutrition. Indirect calorimetry or standard predictive equations such as the Food and Agriculture Organization (FAO)/WHO and Schofield equations can be used to measure energy needs, and the Dietary Reference Intake (DRI) can be used to estimate protein requirements. Children with malnutrition often have an increased rate of metabolism because of altered body composition, and this may increase further during the initial phases of nutritional management as resting energy expenditure (REE) increases and the child becomes anabolic.

Caregivers should be asked to describe the mealtime environment and the child's feeding habits. The assessment should identify components of the feeding problem, clarify the family's treatment objectives, and determine whether the family's goals are appropriate and achievable [30]. A specialized feeding assessment of patients with complex feeding disorders often includes a review of medical records, a clinical interview, caregiver-completed questionnaires, and mealtime observation [31].

3.2. Clinical Interview

A clinical interview is used to clarify the family's concerns and focuses on obtaining information for making a diagnosis and developing treatment strategies. Interdisciplinary interviews are especially beneficial considering that feeding disorders are multifaceted in etiology and help in creating an optimal treatment plan for the patient and family. Interviews focus on the following issues: the onset and nature of present feeding problems; the child's medical and developmental history; feeding milestones; the family's mealtimes and daily routines; cultural meal practices; the family's mental health history; current family stressors; perception of feeding problems; previous attempts at interventions; and desire to engage in therapeutic interventions [31].

3.3. Feeding Questionnaires

Feeding questionnaires can be used to gather information prior to evaluation and to assess the child's medical, developmental, and environmental status. A number of pediatric feeding questionnaires have been developed to assess feeding strategies [32–36] and feeding skill deficits [37] and to assess special populations such as autism spectrum disorders [38]. Symptom Checklist-90 [39] and the Parenting Stress Index [40] questionnaires can provide

an assessment of parents' psychosocial functioning and other caregiver factors that may affect feeding behaviors.

3.4. Mealtime Observation

Observing the interaction between the child and the parent or caregiver during a meal is central to the feeding assessment [41]. The goal of the observation is to determine whether the caregiver-child interaction is reinforcing the feeding problem (e.g., the caregiver is coaxing the child to eat). Typically, mealtime observations are performed under conditions as close to the home environment as possible, simulating a meal as it might occur at home. Ideally, a meal is simulated after fasting for 2–4 h, and a one-way mirror or a closed-circuit television can be used to minimize the effects of direct observation on feeding interactions while assessing behavior and feeding-related skills [31]. Observing how the child manages oral secretions provides information about swallowing function, airway protection, and oral-motor control. Standardized scales for caregiver-child interactions [42], oral-motor function [43], and mealtime interactions [44] can provide a complete picture of the assessment and identify the most appropriate treatment modalities.

3.5. Physical Examination and Laboratory Studies

A complete physical, neurological, and oral-motor examination must be performed. Assessment of the oral-motor process includes evaluation of the following features: symmetry of facial features, including the position of lip and jaw, shape and height of the palate; symmetry and movement of the tongue; oral reflexes and nonnutritive sucking in young infants; laryngeal function, as noted by vocal intensity, pitch, and quality; and cranial nerves. Laboratory studies should be ordered depending on the patient's history and physical examination findings. In cases of malnutrition, it is reasonable to order the following laboratory studies: complete blood cell count; serum electrolytes; blood urea nitrogen; and celiac disease screening, including immunoglobulin (Ig) A antibodies to tissue transglutaminase. In cases of pica disorder, it is reasonable to order serum iron and lead level tests.

3.6. Assessment of Dysphagia

Dysphagia is a general term used to describe any difficulty in transitioning food/liquids from the mouth to the esophagus. There are various levels of dysphagia, ranging from complete dysphagia of all food textures to dysphagia only with thin liquids. Dysphagia can lead to avoidance of food intake and consequently a feeding disorder and a variety of other medical issues, including the potential for aspiration [45] and recurrent pneumonia [46]. Dysphagia is observed at a high frequency in children with neurological issues, such as cerebral palsy or neuromuscular diseases [47]. Children with these disorders need a comprehensive evaluation due to their high risk of dysphagia. Assessment of dysphagia is usually completed by speech-language pathologists, often in conjunction with radiologists or another specialist. The most commonly utilized studies to assess feeding and swallowing are the videofluoroscopic swallow study (barium swallow) or the fiberoptic endoscopic evaluation of swallowing [48]. A barium swallow is an excellent tool for assessing esophageal function, structural abnormalities, and gastroesophageal reflux. The modified barium swallow is specifically designed to evaluate the pharyngeal swallowing function.

Esophageal inflammation should be suspected in patients with difficulty swallowing. Significant inflammation of the esophagus leads to odynophagia, which can also result in reduced intake. Esophageal inflammation may result from significant gastroesophageal reflux, eosinophilic esophagitis, or a variety of other etiologies. Children who have experienced a traumatic swallowing event may have an ongoing fear of swallowing (globus hystericus). The evaluation of swallowing issues varies depending on the age and history of the patient. Therefore, the crucial initial step is obtaining a thorough history. Often, the next step is to conduct an upper GI tract contrast study to delineate the anatomy and grossly assess the motility of the upper GI tract. Many children with these issues are seen

in consultation with a pediatric gastroenterologist. There may be a need for an esophago-gastroduodenoscopy for examination and biopsy of the enteric mucosa. A pH probe to quantify reflux may be recommended. Some patients may need an esophageal motility study to evaluate for dysmotility of the upper GI tract.

4. Management of PFD

Feeding difficulties take time to resolve and are best managed in progressive phases. Following the initial evaluation, a series of short-term goals are typically developed that can lead to complex interdisciplinary coordination of care. Using a stepwise treatment approach to PFD is important because, even though feeding problems are relatively common—occurring in up to 45% of children in the general population—the condition is severe enough to warrant intensive intervention in about 10% [49–51]. A stepwise approach ensures that feeding problems are not overlooked or treated inappropriately.

4.1. Stepwise Approach to PFD

In the initial phase, a comprehensive history and physical examination, including a review of growth parameters and a dietary assessment, should help identify red flag symptoms and signs in each domain that require prompt attention and need for an in-depth investigation or interdisciplinary management [52]. Dysphagia, odynophagia, aspiration, severe malnutrition, and frank nutrient deficiencies need immediate attention. In addition to identifying red flags, it is important to screen the child’s oral-motor development, stabilize nutrient intake, and address aversive parental feeding practices [49] (Table 3). Signs related to oral-motor dysfunction, such as excessive drooling, poor postural control, abnormal muscle tone, excessive gagging or choking, failure to advance through textures, difficulty managing food in the mouth, or difficulty with feeding milestones will require referral for an oral-motor evaluation [53]. Nutrient stabilization includes supplemental calories for growth failure, multi-nutrient supplementation for limited dietary variety, and single-nutrient supplementation for documented deficiency [54,55]. Reviewing basic feeding guidelines (Table 3) should be part of anticipatory guidance for all children and should help discourage aversive feeding practices [56].

Table 3. Initial Management of Pediatric Feeding Disorder.

Identify Red Flags	Evaluate for Signs of Oral Motor Dysfunction	Stabilize Nutrient Intake	Review Basic Feeding Guidelines
Aspiration Dysphagia Pain with feeding Vomiting and diarrhea Developmental delay Chronic cardio-respiratory symptoms Growth failure Nutrient deficiencies Force-feeding	Excessive drooling Poor postural control Abnormal muscle tone Excessive gagging or choking Failure to advance textures Difficulty with feeding milestones Difficulty managing food or liquid in mouth	Supplemental calories for growth failure Multi-nutrient supplementation for limited dietary variety Single nutrient supplementation for deficiency	Avoid mealtime distractions Maintain pleasant, neutral attitude while feeding Limit meal duration Provide 4–6 meals/snacks a day with water in between Serve age-appropriate foods Systematically offer new foods (8–15 times) Encourage self-feeding Tolerate age-appropriate mess

Note. Adapted with permission from Milano, K.; Chatoor, I.; Kerzner, B. A Functional Approach to Feeding Difficulties in Children. *Curr. Gastroenterol. Rep.* 2019, 21, 51 [49].

In the next phase, if feeding problems do not improve within a few weeks after the initial evaluation, more specific interventions tailored to the child’s eating behavior and parental feeding style are necessary. Common eating behaviors in children include limited

appetite, food selectivity, and fear of feeding [57,58]. Rumination and pica are less common but may also impact oral intake. Some children may have more than one eating behavior, and the contribution of each to feeding dysfunction should be assessed. Interventions for limited appetite focus on hunger inducement coupled with nutritional supplementation and behavioral therapy. Pharmacological treatment with appetite stimulants (e.g., cyproheptadine and megestrol acetate) is commonly used to improve appetite and weight gain and appears to be safe and effective [59]. Targeted interventions for food selectivity include frequent exposure to new foods, parental modeling with subtle encouragement, sensory integration, and/or behavioral therapy. Fear of feeding can be addressed by developing strategies to reduce feeding-related anxiety, including changing the mealtime environment, using alternative feeding equipment, and giving anxiolytic medications. In addition, understanding the influence of parental feeding style on the child's eating behavior is helpful in developing a therapeutic strategy [60–62].

4.2. Interdisciplinary Management

Referral to specialized care should be considered when feeding problems are complex or difficult to resolve. Many major medical centers have outpatient interdisciplinary teams that focus on feeding problems. The team approach can benefit a family by avoiding duplication of services and allowing feeding issues to be addressed by one team that can identify subsequent therapies that might be necessary. Studies have found overall reductions in tube feeding, increases in oral intake, improvements in eating behavior, and reductions in parental stress as a result of interdisciplinary intervention [63].

Interdisciplinary feeding teams that focus on pediatric patients often include medical, nursing, nutritional, and social services. Core members of the team usually include a speech–language pathologist or an occupational therapist, a behavioral psychologist, a gastroenterologist, and a developmental pediatrician. The role of the speech–language pathologist includes assessing oral-motor function by performing a clinical swallowing evaluation with or without an instrumental exam (e.g., a videofluoroscopic swallow study or a fiberoptic endoscopic evaluation of swallowing). The speech–language pathologist also takes an active role in treatment to facilitate the development of oral sensorimotor skills. The role of the dietitian includes assessing caloric intake, providing a nutritional plan, and managing enteral feedings. The role of the behavioral psychologist is to provide a behavioral perspective on PFD, assess for comorbid behavioral or psychiatric conditions, and provide behavioral interventions. The role of the gastroenterologist is to assess and treat GI conditions associated with PFD, such as gastroesophageal reflux disease (GERD), severe constipation, and eosinophilic esophagitis, and coordinate care between team members. A developmental physician will further assess and treat developmental and behavioral problems, including attention deficit/hyperactivity disorder (ADHD), autism spectrum disorder, and caregiver–child conflict. Each member of the interdisciplinary team provides initial assessments, and then a unified treatment plan is devised. Hospitalization may be necessary in some cases to confirm the diagnosis, perform specific laboratory tests, monitor weight, provide optimum nutritional intake, and observe caregiver–child interactions.

4.3. Interventions for Dysphagia

Oral-motor skills usually improve over time; however, they can be promoted in a more organized and efficient manner with therapy. Speech–language pathologists and occupational therapists are most often involved in applying therapeutic interventions, such as the modification of bolus size, specialized nipples and bottles, thickened liquids, proper positioning and posture, oral-motor and desensitization exercises, and the alteration of food texture, temperature, and/or presentation. However, the evidence base for these interventions is limited [64,65]. The prognosis depends on the etiology of the dysphagia and the potential for developmental progress.

Thickening feedings is one of the primary interventions to treat dysphagia. However, there is limited efficacy data to support thickening feedings despite the fact that it is fre-

quently used. A systematic review of 22 studies on the effects of thickened feedings on swallowing physiology and pulmonary health outcomes reported mixed findings. There was no significant increase in the rate of adverse effects from the use of thickened feedings [66]. However, adverse events have been reported with the use of thickened feedings in preterm and newborn infants [67]. In May 2011, the U.S. Food and Drug Administration issued a report on 15 preterm infants who developed necrotizing enterocolitis (NEC) after the use of a thickening agent [68]. Currently, no clear etiology by which thickeners lead to NEC has been established; however, it is suspected that the fact that the GI tract in preterm infants may not have a fully developed mucosal barrier could be a factor.

There are a few alternatives to the thickening formula that allow continued oral feedings apart from nasogastric feeding, which bypasses the oral cavity and esophagus. Slow-flow nipples can limit the speed rate of bottle-feed delivery to a safe level as compared to standard-flow nipples. Studies of nipple flow rates have shown that the measured flow rates are extremely variable and are not consistent from nipple to nipple within the same type [69,70]. Another approach has involved using a side-lying position for feedings rather than the normal cradle position; however, only a few small studies have been conducted on this approach with mixed results [71–74]. Transcutaneous neuromuscular electrical stimulation is a new therapeutic approach for dysphagia in children, involving external electrical stimulation of the peripheral motor nerves of the anterior throat to activate the pharyngeal muscles involved in swallowing.

4.4. Behavioral Treatment

There is strong evidence supporting the use of behavioral interventions in the treatment of PFD [8,51]. Behavioral feeding therapy is appropriate when the child's medical, oral-motor, and nutritional status have stabilized but feeding difficulties continue. Behavioral treatment generally has five goals: (1) increasing desirable mealtime behaviors; (2) decreasing undesirable mealtime behaviors; (3) optimizing pleasurable caregiver–child interactions at mealtimes; (4) decreasing caregiver stress; and (5) making progress in developmentally appropriate intake (e.g., moving from purées and smooth foods to chewable solids) [31]. Behavior management techniques are designed to strengthen desirable behaviors and weaken undesirable/maladaptive behaviors. Behavioral treatment plans can be implemented in various settings, such as outpatient, partial day, and inpatient facilities. Treatment should be initiated via the least intrusive approach, which is generally in the outpatient setting.

4.5. Dietary Interventions

Nutritional support is begun as soon as a child is identified as being at risk and should aim to establish a balanced and healthy diet. Methods of nutritional support include oral supplementation, increasing the formula's caloric density, enteral feedings (nasogastric or jejunal), and parenteral nutrition. Risk factors necessitating dietary intervention include the present nutritional status, underlying medical conditions, anticipated therapy, current caloric intake, and past medical history. Oral supplementation is recommended as the initial step for patients who can consume sufficient energy and nutrients safely, either with specific supplements or by increasing the caloric density of the formula. If the caloric density of the formula is increased, care must be taken to provide adequate free water to avoid dehydration and electrolyte imbalances.

Patients who cannot consume sufficient energy and nutrients by mouth require enteral (i.e., tube) feedings. Enteral feedings can be delivered via nasogastric tube or gastrostomy tube (g-tube). Nasogastric feedings are simple to administer and allow normal digestive processes and hormonal responses. If gastric feedings are required for longer than six weeks, a g-tube placement is preferred. Percutaneous endoscopic gastrostomy and laparoscopic gastrostomy have largely supplanted open laparotomy for the placement of g-tubes. Gastric feedings can be administered as an intermittent bolus or continuously. Intermittent bolus feedings are preferred since they align more closely with normal physiologic activity.

Transpyloric or jejunal feedings are indicated in patients with significant gastroesophageal reflux, impaired gag reflex, gastric motor abnormalities, or intractable vomiting. Jejunal feedings are generally administered continuously for a specified period to meet caloric needs. Parenteral nutrition should be initiated only when the child's caloric needs cannot be met through oral or enteral feedings. Although beneficial for optimal physical development, feeding tubes may negatively impact the development of oral feeding skills by limiting the child's hunger drive and may increase the risk of the child developing an oral aversion to taking food by mouth. To reduce the risk of developing oral aversion, it is recommended that oral feeds should precede supplemental tube feeds when it is safe to do so, and oral sensory and motor therapy should be performed along with nutritional adjustments.

Transitioning from enteral feedings to oral feeds requires attention to establishing adequate hunger cues and feeding and oral-motor skills, maximizing caregiver interactions, and often, providing behavioral therapy. Children who have received chronic tube feedings often miss critical transition periods for eating, such as beginning solid foods. Subsequently, these children demonstrate a significant oral aversion to eating, especially textured foods. Transitioning from enteral feedings to oral feeds should be a slow and gradual process. First, patients on continuous feedings are slowly transitioned to bolus feedings. Next, food by mouth is offered before each daytime bolus feeding to simulate a mealtime schedule. As the child consumes more calories by mouth, the tube feedings can be decreased accordingly. This process will be more successful if performed in conjunction with oral sensory treatment and close monitoring by the interdisciplinary team. Currently, there are multiple approaches to the tube-transitioning process, including intensive inpatient and outpatient hospital-based programs. Considerations when selecting a transitioning approach include underlying medical conditions, the developmental feeding skill level, the child's temperament, the duration and method of enteral feeding, and family psychosocial dynamics. Children who receive no feeds, fluids, or flushes through their g-tube for 6–12 months are candidates to have the device removed. Premature removal may increase the child's risk for complications, such as malnutrition.

5. Conclusions

Feeding disorders are common in children and represent a cluster of symptoms that are often of significant concern to families and pediatricians alike. A unifying diagnostic definition of PFD has been proposed by a panel of experts well-versed in the care of children with feeding disorders. Community healthcare providers are frequently the first individuals to evaluate and treat children with feeding disorders. When feeding problems are complex or difficult to resolve, referral for specialized care should be considered, since more specific interventions tailored to the particular child's eating behavior and parental feeding style are necessary. Increases in oral intake, reductions in tube feeding, improvements in eating behaviors, and reductions in parental stress can be achieved as a result of an interdisciplinary intervention.

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