Curr Psychiatry Rep (2012) 14:421–431
DOI 10.1007/s11920-012-0293-8

EATING DISORDERS (E ATTIA, SECTION EDITOR)

Beyond Picky Eating: Avoidant/Restrictive Food Intake Disorder

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Published online: 5 June 2012

Abstract Disorders related to ingesting adequate variety and amounts of food, often dichotomized into *feeding* or *eating* disorders, depending on the need for affected individuals to be fed or to eat on their own respectively, include a wide variety of conditions. This paper focuses on disorders that are *not* also associated with behaviors related to weight-control or self-concept strongly influenced by body weight or shape, as seen in anorexia nervosa or bulimia nervosa. In contrast to eating disorders, there is a relatively sparse body of literature, inconsistent and confusing set of terms and definitions, and conflicting classification schemes applied to feeding/eating disturbances. A new scheme is proposed to improve clinical utility and include individuals who experience morbidities that could benefit from diagnosis and treatment, but are presently excluded from classification. Key research findings are highlighted, and core clinical features regarding diagnosis and treatment are detailed. Two illustrative cases frame the clinical aspects of these conditions.

Keywords Avoidant/restrictive food intake disorder · Picky eating · Feeding disorder · Infantile anorexia · Selective eating · Food avoidance emotional disorder · Functional dysphagia · Food aversion · Food refusal · Neophobia · Food phobia · Perseverant eating · Sensory food aversion · DSM-5 · Classification

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Introduction

Common disturbances in feeding and eating seen in clinical settings include: lack of interest in, or appetite for, food; delayed or absent development of feeding/eating skills; avoidance or refusal of foods based on sensory factors; difficulty swallowing; or using feeding to stimulate, comfort, or self-soothe [1•]. Furthermore, similar clinical presentations of feeding or eating problems may have different etiologies requiring different treatment interventions: difficulty managing food in the mouth may be due to low oral muscle tone or coordination, increased sensitivity to texture in autism, or a conditioned response to an aversive experience with underlying gastrointestinal tract problems, or a traumatic event such as choking. The child's medical background, temperament, development, and experiences may contribute individually and/or combine with factors relating to the caregiver(s) and the environment resulting in disturbances of normal feeding behavior. Thus, broadly defined feeding problems are relatively common, and can be the result of a number of different contributing factors [1•]. Although many feeding difficulties in infancy and early childhood are transient and resolve without the involvement of clinicians, there is little evidence-based guidance to determine what constitutes a clinically significant feeding difficulty, or to distinguish feeding problems that are likely to be short-lived from those that are more serious [1•].

In the current clinical classification system for mental health disorders—DSM-IV-TR published in 2000—the three disorders in the category of Feeding and Eating Disorders of Infancy and Early Childhood: feeding disorder of infancy or early childhood (code 307.59); pica (code 307.52); and, rumination disorder (code 307.53) are subsumed under the broader category of Disorders Usually First Diagnosed in Infancy, Childhood or Adolescence [2]. Pica

and rumination are associated with ingesting non-food substances, or vomiting either swallowed or partially digested food respectively, and will not be discussed further, although it is important to note that both of these conditions can be first diagnosed beyond adolescence and their key diagnostic features are being reconsidered in the DSM-5 development process [3]. Two cases help to frame the type of conditions under consideration.

Case 1

Tim was a 14-year-old, two-sport (football and lacrosse) high school athlete who presented to an adolescent medicine clinic because of concerns about the limited variety of food intake. His mother was worried about his long-standing eating habits possibly affecting his pubertal growth, as well as implications for the future if they continued into adulthood. Tim's concerns focused on the impact of his limited food repertoire on social interactions, on the realization that he felt "weird" being able to eat only a few foods, his question "what is wrong with me?"

His mother noted that he had been a "picky eater since birth." Because he had a strong aversion to trying new foods, as well as to a wide variety of foods after sampling them, she accommodated his finickiness to ensure that his diet was adequate for growth. When she took him to his pediatrician, she was told to "not worry about it" because Tim was following normal height and weight growth curves, and "will probably outgrow it." His food selectivity remained consistent throughout childhood and early adolescence. She admitted that her willingness to prepare foods specially for Tim was partly responsible for the situation, but his emotional response to being offered—or attempted being forced—to eat new or previously unacceptable foods was not worth the effort. For example, eggs had to be cooked firm (but he could not eat hard boiled eggs), and bacon had to be "burnt to a crisp." Some foods could be eaten hot, but not cold. Different foods on a plate could not touch each other, and often needed to be eaten in a certain order. The smell, color and consistency of foods were also factors associated with avoidance. Tim's father was very supportive of diagnosis and treatment because Tim's selective eating affected both his wife and Tim emotionally. He also noted having a personal history of eating a very narrow range of foods as an adolescent.

Tim was troubled by his condition, which he noted was worsening over time because an increasing amount of eating was occurring in various social situations, such as team meals and parties. He was very socially adept, with a warm, engaging personality and ready smile, which undoubtedly gave him broad leeway with his unusual eating habits. He easily described foods that were aversive to even think about, which could be categorized based on sensory qualities. Being presented with such foods caused anxiety, which made any thought of eating them even more difficult. Tim also revealed some mild obsessive/compulsive traits in non-food domains.

When Tim and his family were presented with an explanation that his food aversion was due to the sensory qualities of foods-to-be-avoided triggering a physiological response (anxiety) in the context of obsessive/compulsive tendencies, both probably related to neural connections in his brain, described as "wiring," they responded enthusiastically and embarked on treatment focused on guided imagery self-relaxation exercises in the clinic prior to eating foods that he wanted, but was unable, to eat. Nutritional counseling took a "sports nutrition" approach to enhance performance and fluoxetine was added after several visits, further enhancing the positive response to treatment. Over the next 3 years, Tim was able to gradually increase the variety of foods that he was able to eat, he grew 7 inches and gained 40 pounds, and was being recruited by several universities for sports scholarships. He continued to have some difficulty eating certain foods based on their sensory qualities, but he felt that he had mastered his emotional response to foods previously assiduously avoided.

Case 2

Gwen was a 10-year-old girl who eagerly went on her first week-long, girls-only, away-camp, which her older sisters had attended until they aged-out. On the second day of camp, she choked on a potato chip, which caused girls at her table to summon a camp counselor, who sent her to the camp nurse, despite her saying that she was fine. The nurse seemed to be annoyed, saying that Gwen "over-reacted." When Gwen tried to explain that she was told to see the nurse, she was dismissed summarily. Thereafter, Gwen was unwilling to try new foods, and would allow her breakfast cereal to sit in milk until it became soggy, and would only eat things like smooth peanut butter for lunch and dinner, avoiding cookies or crackers for fear of choking. When she returned home, the patterns of food avoidance persisted, she lost weight, and avoided situations where she would be expected to eat. When her parents asked about her change in eating habits, she did not tell her parents for embarrassment and worry that she might be "in trouble" because the camp nurse might have told them about the incident.

Her parents consulted the family physician, who diagnosed an eating disorder, and referred her to an eating disorder clinic. Given the acute onset of symptoms, with no evidence of body image or weight concerns, a detailed analysis of the events immediately surrounding the change in eating patterns identified the choking episode and the subsequent emotional distress setting off a chain of events that became habitual as a conditioned response. When

described as an involuntary—and unwanted—response of her esophagus to trauma resulting in reflex spasms to clear the airway, the "psychiatric" aspects of her condition were downplayed and her concern that she "brought this on herself" because of the comments of the camp nurse were repudiated.

Although she did not bring her condition on herself, biofeedback was offered as a means of demonstrating her ability to gain control of the conditioned response. Her ability to "control" her skin temperature in biofeedback exercises gave her confidence that she might gain mastery of the involuntary muscles in her esophagus and retrain them to accept food of varying degrees of coarseness. She practiced self-regulation exercises that she learned in clinic, and also engaged in talking therapy about her experience with the camp nurse and the associated embarrassment and shame. Her sisters also helped by describing some of their experiences with the camp nurse. Once Gwen experienced success in swallowing a variety of foods, she rapidly gained confidence and after four sessions, no longer needed to come to the clinic, but continued the exercises, which she found relaxing when she got stressed.

Classification Schemes for Disordered Food Intake

DSM-IV TR

In this scheme, the category of Feeding Disorder of Infancy or Early Childhood includes four diagnostic criteria, all of which need to be met:

A) Feeding disturbance as manifested by persistent failure to eat adequately with significant failure to gain weight or significant loss of weight over at least 1 month
B) The disturbance is not due to an associated gastrointestinal or other general medical condition (e.g., esophageal reflux)
C) The disturbance is not better accounted for by another mental disorder (e.g., Rumination Disorder) or by lack of available food
D) The onset is before age 6 years

As will be discussed below, examination of the literature and clinical experience in specialty clinics or programs indicate that each of these criteria could benefit from modification or clarification.

World Health Organization's ICD-10 Coding System

In this scheme, Feeding Disorder is also included as a formal diagnosis (code F98), also within the category of Behavioral and Emotional Disorders with Onset Usually Occurring in Childhood and Adolescence [4], and is very similar to the current DSM-IV criteria, but without lettered criteria: "A feeding disorder of varying manifestations usually specific to infancy and early childhood. It generally involves food refusal and extreme faddiness in the presence of an adequate food supply, a reasonably competent caregiver, and the absence of organic disease. There may or may not be associated rumination (repeated regurgitation without nausea or gastrointestinal illness)." Neither the ICD nor the DSM-IV classification system addresses the severity or cause of the feeding problem, and are limited by criteria that may be difficult to interpret in clinical situations [5•]. What is a "reasonably competent caregiver," or the extent of investigation required to ensure that "the disturbance is not due to a general medical condition?" For example, Williams and colleagues reported that only 19 out of 234 children referred to a feeding program met DSM-IV TR criteria for a feeding disorder [6].

Alternative Classification Schemes

A variety of alternative classification systems related to feeding or eating, generally focused on infants and children, have been suggested in the literature. There have been two main alternatives:

1. Viewing feeding disorders as "shared" disorders between parent/caregiver and infant or child
2. Creating sub-grouping classification systems, as detailed below

Feeding Behavior Disorders

This scheme clearly focuses on these conditions being "psychiatric" in nature and assumes that diagnosis is related both to prognosis and to specific treatment methods. Proposed and modified over the years by Chatoor and colleagues, it identifies six distinct subgroups of feeding problems, related to:

1. Disorder of state regulation
2. Disorder of reciprocity between infant/child and caregiver
3. Infantile anorexia
4. Sensory qualities of food
5. A concurrent medical condition
6. Insults to the gastrointestinal tract [7, 8]

Infantile anorexia deserves mention. The problem is often attributed to "picky" eating, characterized by a "tenacious refusal to eat adequate amounts of food" over the course of 1 month or longer, with onset generally during the transition to self-feeding, "failure to express hunger and a variety of behaviors including food-related tantrums, strong refusal when offered food, attempts to climb out of the high chair and/or leave the table after minimal bites are eaten, and an

enhanced interest in play and physical exploration during mealtimes, resulting in seriously inadequate food intake and growth failure" [9•]. Other authors have suggested closely related classification schemes for infantile anorexia, distinguished by early disorder of *homeostasis*, anorexia resulting from serious disorder of *attachment*, anorexia by disorder of *mother–child interactions*, or *early and complex* anorexia, mixing an organic vulnerability and difficulties in bonding, which may be secondary to the underlying organic issues [10]. In this context, the term "anorexia" does not capture the full intensity of the clinical picture, since there is clearly much more occurring than a passive lack of appetite or hunger. These same categories are mapped onto the "Zero to Three" system from the American Academy of Pediatrics (AAP) [11, 12].

Feeding Disorder Between Parent and Child

Feeding Disorder Between Parent and Child, proposed by Davies and colleagues, is driven by a strong emphasis on the multiple facets of the environment in which an infant/child with feeding difficulties develops [13], and suggests that feeding disorders should be considered as *relational* in nature. Although a variety of infant/child factors (e.g., medical, structural, and functional abnormalities, temperament and developmental problems, and syndromes) have been linked to the origins of feeding disorders [5•], environmental and parental factors may serve to initiate or maintain them [14]. For example, research suggests that mothers who have an infant/child with a feeding disorder may be more unpredictable, coercive, controlling, insensitive, intrusive, overstimulating, and likely to use force feeding or physical punishment in association with anger and hostility, and less likely to be flexible, accepting, affectionate, or able to accurately receive the child's signals [5•]. In addition, studies of mothers with children with feeding disorders are more likely to have maternal depression, anxiety, eating disorders, mood, and personality disorders [5•], but "picky eaters" are not more likely to develop eating disorders themselves as they get older [15]

In a broader context, this relational model proposes that primary problems (e.g., medical, functional, neuropsychiatric, or neuromuscular) might impair the infant/child's ability to feed, secondarily negatively affecting the relational interaction during feeding, resulting in heightened parental anxiety and concern. This is basically an ecological model in which the infant/child affects the environment and the environment reciprocally affects the infant/child. Parents of an infant/child with developmental delay or physical illness may feel added pressure about feeding, which may be perceived by the infant/child in such a way that actually decreases intake and increases food aversions in an operant conditioning model [13, 16, 17].

Normal feeding and eating requires the integration of a range of physical functions and interpersonal relationships during early development; disruption in one or more of these multi-system areas can result in a feeding problem. Rigid caregiver behavior with regard to eating and growth, failure to recognize satiety cues, chaotic parental behavior or mental health patterns, lack of awareness of appropriate and adequate food, failure to expose the child to a range of foods, limitations in parental problem-solving skills, and inability to provide an appropriate feeding environment have all been demonstrated in a range of different populations and contexts to influence the development of an infant/child's feeding patterns and more general psychosocial skills [5•]. If parents perceive their infant/child's feeding disorder as a reflection of bad parenting, the resulting behaviors, which may be interpreted as the *cause* of the feeding problem may actually be the *result* of it. For example, it has only recently been accepted by a broad range of professionals that parents *do not cause* eating disorders [18•]. Likewise, only recently have the feeding and eating difficulties found in children with autism not been blamed to a large extent on parenting behaviors, skills or style. Labeling and stigmatization are rarely of benefit to patients, parents, or treatment.

Food Refusal Behaviors

Food Refusal Behaviors as a focus of feeding disorders has been proposed by Dovey and colleagues as a classification scheme because the DSM-IV feeding disorder criteria and descriptions are ambiguous and require clarification because of the wide variation in interpretations in clinical practice [19]. To improve clinical utility, they propose five food refusal patterns:

1. Learning-dependent food refusal
2. Medical complications-related food refusal
3. Selective food refusal
4. Fear-based food refusal
5. Appetite awareness and autonomy-based food refusal

The proposed advantage of this approach is based on their evidence-based assertion that different interventions are required for different etiologies. However, there is not a robust body of literature to support this approach. In addition, "refusal" implies a degree of spiteful willfulness that might not be present, and is also pejorative. In DSM-5, replacing the word "refusal" with "inability" more accurately characterizes difficulties with body weight maintenance in anorexia nervosa.

Dovey's group also studied "food neophobia" (reluctance to eat, or the avoidance of, new foods) and "picky/fussy" eating (inadequate dietary variety based on rejection of many foods with which they may or may not be familiar), sometimes called "finickiness", in relation to the acceptance/rejection of fruits and vegetables [20]. They point out that the influence of food

neophobia on a child's willingness to try novel foods diminishes after tasting is a positive experience. Thus, they emphasize the importance of instituting behavioral interventions early in life to attenuate food neophobia and "picky/fussy" eating. In this regard, Shim and colleagues studied the association between adherence to infant feeding guidelines and development of picky eating behaviors in preschool children, and found that following AAP guidelines for exclusive breastfeeding for 6 months and delaying introduction of complementary foods until 6 months of age reduced unhealthy eating behaviors, especially limiting the variety of foods, during preschool years [21]. With respect to specific interventions to decrease food neophobia and encourage children to try new foods, Mustonen and Tuorila described an innovative French sensory education program (*Classes du gout*) in which "taste lessons" teach young children to become well-informed consumers aware of the quality of and differences between foods through their sensory impressions, appealing to children's innate interest and curiosity [22•].

In a prospective longitudinal study of 120 children and their parents, 3–22% of children were reported to be picky eaters [15]. Although incidence declined over time, 40% of affected individuals had picky eating for more than 2 years, and those with longer duration had stronger likes and dislikes of food and not accepting new foods, than those with shorter duration. Parents of picky eaters were more likely to report that their children ate a limited variety of foods, required their food to be prepared in specific ways, expressed stronger likes and dislikes for food, and threw tantrums when denied foods that they requested. They were also more likely to report struggles over feeding, preparing special meals, and commenting on their child's eating. Hence, picky eating is a prevalent concern of parents and may remain so through childhood. It appears to be a relatively stable trait reflecting an individual eating style. Although no significant effects on growth were observed in picky eaters over time, affected children displayed more internalizing and externalizing behaviors [15].

Behavioral Pediatric Feeding Problems

Behavioral Pediatric Feeding Problems, proposed by Crist and colleagues, applied a 35-item, standardized parent-report feeding assessment tool (Behavioral Pediatrics Feeding Assessment Scale) measuring parent and child behaviors [23]. From a sample of 96 control and 249 referred patients, they identified five patterns of feeding problems, labeled as:

1. Picky eaters
2. Toddler refusal, general
3. Toddler refusal, textured food
4. Older children refusal, general
5. Stallers [24]

Based solely on presenting behaviors, these investigators found that differences between controls and children with feeding disorders were related to parental reports of problem behavior frequency, not specific behaviors themselves, but the five patterns only accounted for 55% of the total variance. This scheme also lacks robust research support by other investigators.

Complex Bio-Behavioral Pediatric Feeding Disorders

Complex Bio-Behavioral Pediatric Feeding Disorders is a classification scheme derived by Burklow and colleagues from previous descriptions and empirical clinical evidence and includes five categories of complex feeding problems:

1. Structural abnormalities
2. Neurological conditions
3. Behavioral and psychosocial issues
4. Cardio-respiratory problems
5. Metabolic dysfunction [25]

This scheme was proposed to correct deficits in categorical classifications systems that did not include mixed etiologies and acknowledges that the five categories are not mutually exclusive. Their study of 103 subjects aged 4 months to 17 years (of whom two thirds were less than 3 years old) referred for poor oral intake and growth failure, found the following categorical combinations: structural + neurological + behavioral (30% of the sample); neurological + behavioral (27%); behavioral alone (12%); structural + behavioral (9%); and structural + neurological (8%). The vast majority of infants/children had behavioral problems (85%), with a significant proportion having a neurological (73%) or structural (57%) abnormality. Few had cardio-respiratory (7%) or metabolic dysfunction (5%) [25]. This classification scheme has appeal because it recognizes that individuals with a feeding disorder are unlikely to have a problem in only one category, and that more than 4 of 5 individuals have an associated behavioral problem—either primary or secondary.

This scheme most closely approximates the biopsychosocial approach proposed by Engel more than 36 years ago [26], which emphasizes that clinical conditions represent an interplay between various "systems levels," but which still competes with a Cartesian dichotomy of a condition being either organic or non-organic used in some schemes. In approaching a feeding or eating disorder, clinicians would do well to assume that there is a major behavioral component that needs to be addressed until proven otherwise, and that biology and behavior interact in the creation and/or maintenance of the problem. However, as is true of several of the classification schemes already described, it is based on a relatively small sample, and there is no supporting evidence in the literature regarding treatment outcome or any other validation. In addition, there is no category that

includes gastroenterological problems. This may be a reflection of the setting in which this study was performed, a Division of Psychology at an internationally recognized Children's Hospital, which also has an internationally recognized Pediatric Gastroenterology unit, including a Pediatric Neurogastroenterology and Motility Disorders Program [27]. This highlights a significant limitation of much of the limited research in the field, data from a medically-based service that treats individuals with feeding and eating problems may differ from data based on mental health-based services. Indeed, patients referred to a feeding disorder program in a pediatric medical unit may differ from those referred to pediatric psychology unit.

Clinical Presentations Characterized by Avoidance of, or Restricted, Food Intake

There are a variety of conditions most commonly seen in middle childhood that feature avoidance of food or restricted food intake. The ingestion of food may be inadequate in terms of the variety of foods accepted and/or the intake of caloric energy, which may or may not be associated with weight loss, failure to gain weight, or significant growth impairment. Applying the current DSM-IV TR criteria, at least some of these individuals may be diagnosed with eating disorder not otherwise specified (EDNOS), even though they might not have body weight or shape concerns. Diagnostic terms applied to these individuals include: food avoidance emotional disorder, restrictive eating, selective eating, choosy eating, perseverant eating, sensory food aversion, chronic food refusal, food neophobia, functional dysphagia, and phobias (e.g., fear of vomiting, defecating, that lead to reduced food intake [5•]. The literature suggests that in the absence of body weight or shape concerns, three main subtypes exist, based on the overall adequacy of food intake, the range of foods accepted, or avoidance due to a specific fear [5•]. Each of these will be discussed next.

Presentations Characterized by Inadequate Food Intake

Food avoidance emotional disorder (FAED) is characterized by inadequate caloric intake, most often seen in children [1•]. Higgs and colleagues introduced this term to describe a group of children with inadequate food intake and emotional disturbance who did not meet criteria for anorexia nervosa, but who presented with "a disorder of the emotions in which food avoidance was a prominent feature in the presenting complaint…and a history of food avoidance or difficulty such as food fads or restrictions of at least 1 month, failure to meet existing criteria for AN, and the absence of organic brain disease, psychosis, illicit drug abuse, or prescribed drug related causes" [28]. Bryant-Waugh and Lask based their Great Ormond Street Hospital checklist, in which food avoidance is regarded as emotionally based, on this approach, but without any motivational attribution (e.g., avoiding weight gain or vomiting) [29]. Children with FAED are troubled by emotional problems, such as sadness, worries, or obsessions that impair appetite and eating, but the presenting concern is weight loss or poor eating habits, rather than concern about mental health issues [5•]. Nicholls et al. recommend treatment to focus on both the emotional disturbance and associated weight loss, similar to eating disorders [30]. The original report by Higgs' group indicated that children with FAED may have a worse psychological prognosis than expected for childhood emotional disorders in general [28].

In a review of the literature by Bryant-Waugh and colleagues, the limited available evidence suggests that the term FAED is most commonly used with school-age children and adolescents, possibly representing a later variant of infantile anorexia or restrictive eating described above. Although Casper suggested that FAED might be a precursor of anorexia nervosa [31], there is not sufficient evidence for this. However, Bryant-Waugh and Lask report that many children with FAED have a history of physical illness, or medically unexplained symptoms, suggesting that in some patients FAED may be manifesting as a somatoform condition. Similarly, Christie and colleagues reported that girls are more commonly affected by FAED and tend to report previously being physically unwell [32].

Although FAED is a widely recognized food intake disorder, there are limited associated data on its incidence or prevalence. Cooper and colleagues studied a cohort of 126 patients referred to a specialty pediatric eating disorder service of whom 70% had pre-menarchal onset of their eating disturbance. Of these, 43% were diagnosed with anorexia nervosa, 29% with FAED, 19% with selective eating, and 9% with another eating disturbance [33]. Although much of the literature on FAED since its original description has been generated by the group at London's Great Ormond Street Hospital for Children, limiting generalizability [5•], recently FAED has been identified in surveillance studies in Australia, Canada, and elsewhere in the UK [34].

Presentations Characterized by Restricted Range of Food Intake

Another pattern is an aversion to, or avoidance of, foods related to the appearance, smell, texture, taste, and/or temperature of food, often labeled as "sensory food aversions" [5•], in which an affected individual's sensitivity to these features is imperceptible to the unaffected. This aversion can be so entrenched that even withholding preferred foods will not induce a child to eat forbidden foods. Such children may

only eat foods of a particular color (e.g., white or bland colored foods such as milk, bread, plain pasta, etc), or texture (e.g., never having moved from pureed to mixed texture foods, or only crisp foods). Others may only ingest foods based on packaging or brand name, or only eat cold or hot foods [5•]. Parents who attempt to substitute a food that looks, smells and tastes to them exactly like an acceptable food run the risk of no longer being trusted by their children with respect to foods being presented; affected individuals are able to detect extremely subtle flavors, and may believe that their parents are trying to "trick" them into eating something. Unfortunately, there are children who are unable to tolerate the smell of foods that are not part of their diet, making them unable to eat with family, peers, or others [5•].

Common to all of these children is the avoidance of foods based on their sensory profile. If the accepted range of foods is not adequate to maintain health, these children may experience symptoms related to nutritional deficiency, as well as adverse effects on growth. If only smooth textures are accepted, the oral motor skills required to chew and swallow solid food may not develop, which may adversely affect speech. In addition, such unusual eating patterns may produce serious social problems, anxiety, frustration, and stress in the child as well as in the parents, often leading to conflict if both parents do not agree on the best strategy to address the problems. Such conflict tends to only increase the emotional burden on the child [5•]. However, it is important to note that there is emerging literature reporting that individual differences in reluctance to try new foods may be related to physiological reactions [35].

Raudenbush and Capiola studied the physiological responses to pictures of food and non-food stimuli in 23 young adults, with a mean age of 19.2 years. Comparing those with high scores on the Food Neophobia Scale demonstrated greater increases in pulse, galvanic skin response, and respirations when presented food stimuli, with no difference from those with low food neophobia presenting with photos of landscapes, people, clothes, etc. They concluded that such increased physiological arousal in neophobics, who tend to be picky eaters, may lead to poor nutrition and food variation to reduce the anxiety response to the presentation of novel foods, and suggest that desensitization therapy may help to attenuate overt physiological reactions to food-specific stimuli [36•]. As is true of many conditions that are initially assumed to be "emotional" or "behavioral" based on observable information, there is an underlying "organic" physiological response related to increased autonomic nervous system activity. That is, merely viewing a picture of food—without smell, taste, color, temperature or other sensory cues—creates an image that is associated with a cascade of automatic, involuntary, and sometimes uncomfortable responses that trigger the observed behavior. This was true for Tim, presented as Case 1. More research is needed in this area.

Presentations Characterized by Avoidance Due to a Specific Fear

Globus Hystericus is an older term referring to functional dysphagia related to a fear of swallowing that leads to limiting food that is put in the mouth to avoid choking, vomiting or gagging, and may be accompanied by unintentional and unwanted weight loss. Depending on the severity and duration of the food avoidance, these patients can develop symptoms associated with weight loss similar to patients with anorexia nervosa, often leading to a diagnosis of an eating disorder. [5•]. The avoidance behavior is often triggered by a specific traumatic event, such as in Case 2, Gwen. In most instances, they respond well to standard treatment for a phobia, including desensitization, gradual exposure, and anxiety management.

Limitations of the DSM-IV TR Classification Scheme as a Clinical Tool

Feeding Disorder of Infancy or Early Childhood (307.59)

A) Feeding disturbance as manifested by persistent failure to eat adequately with significant failure to gain weight or significant loss of weight over at least 1 month.

> Critique: Although malnutrition can be significant in extreme cases, the emphasis on failure to gain or to lose weight excludes individuals who have significant difficulties with eating, as demonstrated in the preceding discussion, who could benefit from diagnosis and treatment, but fail to do so because their condition is not associated with weight loss. In some cases, the failure to lose weight may be due to meticulous parental attention to provide adequate nutrition, as in Case 1, which minimizes weight loss, but incurs significant emotional distress for the entire family. In addition, there is emerging evidence that the range of eating disturbances described above are not limited to infants or children. Given the emerging evidence that these conditions can persist into adolescence and adulthood, and for some individuals may be life-long, the term "feeding" is too restrictive. Likewise, eating "adequately" tends to focus too narrowly on body weight. Finally, the duration of at least 1 month is redundant, because the other factors in Criteria B, C, and D would require at least 1 month's duration.

B) The disturbance is not due to an associated gastrointestinal or other general medical condition (e.g., esophageal reflux).

Critique: As previously noted, given emerging evidence regarding the interaction between the psyche and the soma in these conditions, it is not practical, possible, useful, or accurate to dichotomize conditions into "organic" and "non-organic" elements. The axiom that "absence of proof does not constitute proof of absence" applies here. For example, eosinophilic esophagitis (EE) is associated with esophageal inflammation in the absence of acidification and is characterized by large numbers of eosinophilic white blood cells infiltrating the mucosa and proliferation of epithelial cells lining the esophagus, which can be associated with a feeding disorder, vomiting, abdominal pain, and/or dysphagia, and can progress to irreversible fibrosis. Successful management requires identifying the cause, and then implementing and continuing long-term care with effective medical and/or nutrition therapies [37]. However, this condition was first identified in the past decade, and diagnosis of EE requires both an awareness of the condition and its symptoms and esophagoscopy by a clinician familiar with it. Thus, in the past individuals with EE were probably diagnosed and treated under the erroneous assumption that their eating disturbance was not "associated with a medical condition." Also, the use of the term "non-organic" does not necessarily indicate rigorous exclusion of organic components, as shown by Reilly and colleagues, who found that 36% of infants/children referred with "non-organic failure to thrive" actually had oral–motor dysfunction on closer examination [38]. Obviously, not all individuals with an eating disturbance require esophagoscopy, and there undoubtedly will be additional "medical" conditions discovered in the future associated with an eating disturbance. In addition, as Manikam and Perman noted, in many children behavioral problems around feeding may persist after organic difficulties have resolved [14]. Finally, the term "due to" implies a causal relationship, but "associated with" includes both causal and non-causal relationships, which may nonetheless be important in the biopsychosocial model.

C) The disturbance is not better accounted for by another mental disorder (e.g., Rumination Disorder) or by lack of available food.

Critique: The mental health diagnosis with which the eating disturbances described here is most likely to be confused is restrictive anorexia nervosa. The key differentiating feature is the absence of any disturbance in body image or shape in feeding and eating disturbances, while such disturbance is a *sine qua non* for eating disorders. Thus, it would be better to include this exclusion explicitly.

D) The onset is before age 6 years.

Critique: Although the overarching category "disorders usually first diagnosed in infancy, childhood or adolescence" under which feeding disorders are subsumed, allows some leeway with respect to age at onset with the modifier "usually," Criterion D within this subcategory is clear-cut and excludes older children, adolescents, and adults from being diagnosed, severely limiting their ability to receive appropriate treatment. This is unfortunate because affected individuals may feel socially marginalized and their suffering trivialized, not only by their eating patterns, but also by being labeled "picky," "faddy," "selective," or "finicky" with respect to their eating habits. Research is being conducted in this area in adults by Zucker at Duke University who notes that "people who are picky aren't doing this just to be stubborn…extremely picky eaters experience food differently than the rest of us" [39•]. A large-scale, on-line survey for adults, the Food F.A.D. Study (Finicky Eating in Adults), is being analyzed to provide a clearer clinical picture of these conditions in adults [40]. In addition, an on-line support group has been established for adult picky eaters [41], indicating that the 6-year age limit is too restrictive.

Alternative Classification Scheme and Criteria for DSM-5

Informed by the whole of the preceding discussion, consideration is being given to changing the name of the conditions related to eating disturbances in the absence of body weight or image concerns to reflect the breadth of presentations that are clinically relevant and for which there is some evidence base. The term *Avoidant/Restrictive Food Intake Disorder* is proposed by the DSM-5 Eating Disorder Work Group for approval by the DSM-5 leadership; related information is available at (www.dsm5.org/ProposedRevision/Pages/proposedrevision.aspx?rid=110) [42•]. The proposed criteria and rationale, informed by available research and extensive discussion of expert clinical experience and opinion by the 12 Work Group members, is the result of more than 6 years of collaborative work, led by Drs B. Timothy Walsh and Rachel Bryant-Waugh. Although it has somewhat awkward phrasing, the name captures the key clinical features of non-eating disorder eating disturbances: avoiding (not necessarily "refusing") foods for a variety of reasons, and restricting intake in the amount and/or range of foods eaten.

Avoidant/Restrictive Food Intake Disorder

A) Eating or feeding disturbance (including but not limited to apparent lack of interest in eating or food; avoidance based on the sensory characteristics of food; or concern about aversive consequences of eating) as manifested by persistent failure to meet appropriate nutritional and/or energy needs associated with one or more of the following:

1. Significant weight loss (or failure to gain weight or faltering growth in children)
2. Significant nutritional deficiency
3. Dependence on enteral feeding
4. Marked interference with psychosocial functioning

Comments: Because food intake, rather than only feeding, is the primary focus of Criterion A, and to include individuals beyond age 6, the term "eating" is specifically included. The three clinical dynamics most commonly encountered (lack of interest, sensory avoidance, and fear-based avoidance) are included as examples ("not limited to"). In addition, to be more inclusive, nutritional adequacy is not limited to energy ("and/or") and appropriate nutrition includes a variety of foods in the diet. To enhance clinical utility, subcriteria $A_{1–4}$ are considered as a group ("one or more of the following") to include individuals who experience any one of the subcriteria, since their existence is judged to be deserving of diagnosis and appropriate treatment. It is important to note that an individual who only experiences marked interference with psychosocial functioning should be included in the group of individuals for whom the nutritional aspects are not a problem.

B) There is no evidence that lack of available food or an associated culturally sanctioned practice is sufficient to account alone for the disorder.

Comments: The DSM-IV Criterion C phrase "not due to lack of available food" has been added, as has a statement excluding culturally sanctioned eating practices (e.g., religious fasting) that would not be considered a psychiatric condition. We have encountered Muslim patients who fasted in observance of Ramadan, or Catholics who severely restricted intake during Lent, who then went on to continue to restrict their intake in association with a distorted body image and desire to lose weight and developed classic restrictive anorexia nervosa. In retrospect, the fasting/restriction was driven more by the desire to lose weight than for religious purposes.

C) The eating disturbance does not occur exclusively during the course of Anorexia Nervosa or Bulimia Nervosa, and there is no evidence of a disturbance in the way in which one's body weight or shape is experienced.

Comments: This clarification was added because the proposed criteria are intended across the age range, and it is necessary to make a distinction between restricted food intake in the context of eating disorders where there are weight/shape concerns and restricted food intake in the absence of such concerns.

D) The eating disturbance is not better accounted for by a concurrent medical condition or another mental disorder. When occurring in the context of another condition or disorder, the severity of the eating disturbance exceeds that routinely associated with the condition or disorder and warrants additional clinical attention.

Comments: This criterion was clarified to retain consistency with criteria for other eating and feeding disorders. It allows patients to be diagnosed with separate conditions, with the avoidant/restrictive food intake being sufficiently severe to deserve clinical attention.

Conclusion

The variety and complexity of feeding and eating problems in children, with the focus of attention often determined by the type of specialist to whom the patient is referred, has resulted in disagreement about a single classification scheme being widely accepted and used by clinicians across disciplines working in this field. Research into feeding disturbances has been hampered by incompatible approaches to the categorization of feeding disorders adopted from often very different perspectives, resulting in major diagnostic inconsistencies. There is a very limited body of extant data-based research to determine prognosis, course, outcome, and treatment response in feeding disorders using a formal, widely accepted diagnostic or classification system. There is a corresponding lack of standardized and consistently used assessment measures. Although attempts have been made, as detailed in this article, to rectify this situation, the field still lacks detailed description and evaluation of specific interventions for presentations of clearly identified typology [5•]. An internationally recognized and accepted classification system appears vital to move the field forward and in particular to inform clinical interventions for particular feeding disorders. The DSM-5 system will attempt to fill this need as it continues to refine the diagnostic criteria for Avoidant/Restrictive Food Intake Disorder.

Acknowledgements Angela Palomaki is a Leadership Education in Adolescent Health (LEAH) Nutrition Fellow.

Disclosure No potential conflicts of interest relevant to this article were reported.

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