

# Feeding and Eating Disorders in Childhood

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## ABSTRACT

**Objective:** To review the literature related to the current DSM-IV-TR diagnostic criteria for feeding disorder of infancy or early childhood; pica; rumination disorder; and other childhood presentations that are characterized by avoidance of food or restricted food intake, with the purpose of informing options for DSM-V.

**Method:** Articles were identified by computerized and manual searches and reviewed to evaluate the evidence supporting possible options for revision of criteria.

**Results:** The study of childhood feeding and eating disturbances has been hampered by inconsistencies in classification

and use of terminology. Greater clarity around subtypes of feeding and eating problems in children would benefit clinicians and patients alike.

**Discussion:** A number of suggestions supported by existing evidence are made that provide clearer descriptions of subtypes to improve clinical utility and to promote research. © 2010 American Psychiatric Association.

**Keywords:** feeding disorder; pica; rumination; eating disorders; infancy; childhood

(*Int J Eat Disord* 2010; 00:000–000)

## Introduction

In DSM-IV-TR, feeding disorder of infancy or early childhood (FD), pica, and rumination disorder (RD) are the three “Feeding and Eating Disorders of Infancy and Early Childhood” within the larger category of disorders usually first diagnosed in infancy, childhood, or adolescence.<sup>1</sup> They are classified separately from the eating disorders anorexia nervosa (AN) and bulimia nervosa (BN), which have somewhat different presentations in childhood compared to adults, that have been detailed elsewhere<sup>2,3</sup> and will not be further discussed here. This article reviews the available literature on FD, pica, and RD, and a number of other clinically sig-

nificant presentations characterized by avoidance or restriction of eating that usually present in childhood and considers problems related to the use of existing diagnostic criteria in clinical settings to support proposed options for DSM-V.

## Method

Literature searches were conducted manually and with electronic search engines using search terms including but not limited to: feeding disorder; infantile anorexia; pica; rumination; selective eating; food avoidance emotional disorder; functional dysphagia; food aversion; food refusal; neophobia; food phobia; perseverant eating; and sensory food aversion. Broad searches were conducted using these terms in titles, abstracts, and texts, yielding many thousands of references. A nonsystematic synthesis of this literature was performed focusing on articles published in the last 25 years and considered to include material pertinent to classification issues. Evidence-based options were then developed to inform the process of proposing criteria for DSM-V.

## Results

### Feeding Disorder of Infancy or Early Childhood

Because normal feeding and eating depends on the successful 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

Accepted 5 November 2009

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Published online in Wiley InterScience

(www.interscience.wiley.com). DOI: 10.1002/eat.20795  
 © 2010 American Psychiatric Association. This article is being co-published by the *International Journal of Eating Disorders* and the American Psychiatric Association.

problem. Common disturbances in feeding and eating seen in clinical settings include<sup>4</sup>:

- Delayed or absent development of feeding/eating skills
- Difficulty managing or tolerating fluids or foodstuffs
- Reluctance or refusal to eat based on taste, texture, and other sensory factors
- Lack of appetite or interest in food
- Utilizing feeding behaviors to comfort, self-soothe, or self-stimulate

Approximately 25–45% of normally developing children and up to 80% of developmentally delayed children are reported to experience some type of feeding problem,<sup>5–7</sup> but reliability of incidence and prevalence rates for feeding disturbances is compromised by variability in definitions used. Many such early feeding difficulties are transient and resolve without significant clinical input<sup>8</sup>; however, 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.

Disturbances in feeding and eating behavior with similar clinical presentations may have different etiologies that require different interventions. For example, difficulty managing food placed in the mouth may be due to: (a) low muscle tone affecting oral-motor skills; (b) heightened sensitivity to texture associated with autism; (c) an aversive response following intractable vomiting associated with an underlying gastrointestinal condition; (d) a traumatic choking incident in the past; or (e) lack of opportunity to practice related to maternal anxiety about potential for choking. The child's medical background, temperament, development, and experience 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.

"Feeding Disorder" is a formal diagnostic term used in the main current diagnostic systems of the ICD-10<sup>9</sup> (F98.2 Feeding disorder of infancy and childhood) and DSM-IV-TR.<sup>1</sup> Both sets of criteria specify persistent (at least 1 month in duration) failure to eat adequately associated with weight loss, or significant failure to gain weight, that is not directly due to a medical condition or another mental disorder, with onset before 6 years of age. Neither is specific about the extent or severity of the weight deficit or the origin or nature of the

feeding disturbance. However, many children with significant feeding problems may gain weight or fail to have a medical or mental health disorder ruled out, excluding them from this category. For example, Williams et al. found that of 234 children referred to a feeding program, only 19 met DSM-IV-TR criteria for FD.<sup>10</sup>

**Problems Related to Current Criteria for Feeding Disorder.** Each of the four DSM-IV-TR criteria for FD has limitations, as detailed below.

*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.* Some children with feeding disturbances have an extremely limited diet that adversely affects their physical and psychosocial development, but are still able to maintain or gain weight.<sup>11</sup> Although these children may fulfill the first part of the criterion (e.g., failure to eat adequately in terms of nutritional adequacy of their diet), they gain weight, precluding the diagnosis of a feeding disorder. Other children present with delayed or absent feeding skills that cannot be accounted for by an underlying medical condition at the time of presentation. Very commonly such children will have been tube fed so that failure to gain weight or significant weight loss cannot be endorsed. In addition, the limits of the weight gain/loss criterion are not defined and do not take faltering growth into account (i.e., when there has been a downward movement through length/height centiles). Finally, is not clear from the current phrasing whether any direct evidence for "feeding disturbance" is needed, or whether slow weight gain in itself provides sufficient evidence provided that criteria pica, rumination disorder, and other childhood presentations that are characterized by avoidance of food or restricted food intake are also met.

*The Disturbance is not Due to an Associated Gastrointestinal or Other General Medical Condition (e.g., Esophageal Reflux).* Criterion "Pica" suggests that feeding disorders in DSM terms are conceptualized as having a "nonorganic" etiology. By definition, DSM is a system for classifying mental disorders, differing greatly from the ICD system, which classifies all forms of disease and disorder. In the ICD system, feeding problems are classified under a number of different headings, reflecting both organic (structural/functional abnormalities affecting physiology or bodily organs) and nonorganic (social/environmental causes are suspected) etiologies.<sup>9</sup> In practice, the conceptualization of feeding problems as having either an organic or nonorganic basis is difficult to implement or to justify. Such Cartesian dichotomization runs counter

to the widely accepted biopsychosocial approach proposed by Engel.<sup>12</sup> Children with feeding problems are seen in a wide range of clinical settings, the most common of which include those led by physician specialists (e.g., gastroenterologists), by speech and language therapists, or by mental health professionals. Broadly, this reflects a crude division into feeding difficulties secondary to medical problems, to functional difficulties, or to emotional, behavioral, or relational disturbances. Such a tidy distinction is rarely possible in practice, with the vast majority of children having multiple components to their presentation and treatment needs, reflected in the multidisciplinary nature of staffing in most feeding clinics.

Different studies have suggested that 16–30% of cases of feeding problems are “organic,”<sup>13,14</sup> and that up to 80% of cases of feeding disorder referred to specialist pediatric services have a significant behavioral component.<sup>15</sup> A study of 700 children under the age of 10 who had feeding disorders diagnosed found that medical disorder and behavioral problems related to feeding occurred both alone and in combination: 86% had an underlying medical disorder, 61% had some oropharyngeal dysfunction, and 18% had a behavioral problem.<sup>16</sup> Budd and colleagues also reported that 64% of their sample of children presenting for out-patient treatment of feeding problems had a combination of behavior disturbance and subtle oral-motor problems.<sup>17</sup>

To some extent, such figures are determined by the type of clinical setting where the study is carried out, making it difficult to clarify the interplay between physical and psychological factors and even more difficult to disentangle cause and effect. In many children behavioral problems around, feeding may persist after organic difficulties have resolved.<sup>18</sup> Furthermore, the use of the term “non-organic” does not always indicate rigorous exclusion of organic components; Reilly and colleagues found that of 47 children diagnosed with “nonorganic failure to thrive,” 36% were found to have had oral-motor dysfunction on closer examination.<sup>19</sup>

*The Disturbance is not Better Accounted for by Another Mental Disorder (e.g., Rumination Disorder) or by Lack of Available Food.* It is not clear whether “the disturbance” in criterion rumination disorder (and pica) refers to feeding or to poor weight gain. Logically it would appear to refer to feeding, yet a feeding disturbance cannot be accounted for by lack of food. The evidence suggests that feeding disorders most commonly have multi-factorial causes, with a significant behavioral component.<sup>20</sup>

*The Onset is Before Age 6 Years.* An obvious problem with the current DSM system is that children with onset of eating problems after the age of 6 cannot have a formal feeding disorder diagnosed. Clinically significant eating disturbances with onset and presentation in middle childhood are excluded in the present diagnostic scheme and might not receive appropriate treatment.

**Alternatives in the Literature to Feeding Disorder.** Although the introductory text in DSM-IV for “Feeding Disorder of Infancy and Early Childhood” recognized the conceptual inconsistencies and difficulties surrounding the classification of feeding disorders, the system has been criticized for offering only a general definition which does not take the heterogeneity of feeding and growth problems into account or its implications for treatment.<sup>21</sup> There have been two main alternatives: (1) conceptualizing feeding disorders as “shared” disorders between caregiver and child, and (2) creating alternative subgrouping classification systems.

*Feeding Disorders as Relational Disorders.* Davies and colleagues hold that the current classification system fails to encompass the full range of feeding difficulties and places undue emphasis on the problem being solely the child’s, failing to capture important contexts in which the child lives.<sup>22</sup> Although child factors such as temperament<sup>23–25</sup>; organic conditions<sup>26</sup>; structural abnormalities or dysphagia<sup>27–29</sup>; and developmental problems and syndromes<sup>30–32</sup> have been linked with the pathogenesis of FDs, environment and parental factors may also interact to influence and maintain the problems.<sup>18</sup>

Research that has focused on maternal/caregiver influences has found mothers of children with FD to (a) be more unpredictable, coercive, controlling, insensitive, intrusive, and over-stimulating, (b) be less flexible, accepting, and affectionate, (c) be more likely to use physical punishment or force-feeding, (d) have difficulty receiving the child’s signals, and (e) show more anger and hostility during interaction with their children.<sup>33–36</sup> Clinical studies of children with FD have shown high levels of maternal depression, anxiety, eating disorders, mood, and personality disorders.<sup>33,35,37–41</sup>

Thus, rather than focus on the child or the caregiver, Davies and colleagues suggest that a feeding disorder should be defined as a relational disorder—“Feeding Disorder Between Parent and Child.”<sup>22</sup> In support of this concept, child-caregiver characteristics have been shown to interact in a range of ways, consistent with the development and maintenance of FD: parental agendas and

overly rigid behavior with regards to the child's growth and eating,<sup>42,43</sup> failure to recognize satiety cues,<sup>44,45</sup> chaotic parental behavior or mental health problems,<sup>33,38,46–48</sup> lack of understanding about appropriate and adequate food,<sup>49</sup> failure to expose the child to a range of foods,<sup>50</sup> limitations in parental problem-solving skills,<sup>51</sup> and inability to provide an appropriate feeding context<sup>52,53</sup> have been shown in a range of different populations and contexts to influence the development of a child's feeding patterns and more general psychosocial skills.

Organic, medical, neuropsychiatric, or neuromuscular problems may impair the child's ability to feed, affect the feeding dynamic, and heighten parental anxiety and concern.<sup>54,55</sup> Parents of children who are developmentally delayed or who have a physical illness may be especially anxious about nourishment and this concern might lead them to pressure the child to eat.<sup>22</sup> Such pressure may result in a decrease in the child's intake<sup>56</sup> and increase learned food aversions.<sup>47</sup> Ensuing parent-child struggles around feeding may consequently increase parental distress and worry, leading to further attempts to make the child eat that cause further disruption to the feeding relationship.<sup>22</sup> Douglas proposed that parents' thoughts serve as mediators between the objective events and their responses. Parents' perception of their child's FD may lead to internal attributions ("he's not eating because he doesn't like me") that link the ability to feed their child with being a good parent.<sup>57</sup> However, mothers who measure their parenting competence by how and how much their child eats show greater frequency of dysfunctional interactions during feeding in comparison with control dyads.<sup>35,58</sup>

In summary, this approach suggests that feeding disorders should be understood in a context, taking both child and parental characteristics into account, rather than focusing solely on child factors or caregiver factors. This relational approach suggests that the development and maintenance of the difficulty is associated with the complex interplay of factors in the relationship between child and caregiver. Such an approach has obvious implications for assessment and treatment; its relevance to classification is more difficult to determine.

*Subgroup Classifications in the Literature.* In addition to the extensive literature on feeding disorders in a relational context, there are at least four published classification schemes based on certain subgroup features. These include "feeding behavior disorders," "complex biobehavioral pediatric feeding disorders," "behavioral pediatric feeding problems," and "food refusal behaviors" detailed below.

**Feeding Behavior Disorders<sup>21,59</sup>:** In a series of important publications over a number of years, Chatoor and colleagues have developed a sophisticated and detailed classification scheme based on Wing's notion that a psychiatric disorder has three properties: it is a limited syndrome that may have links to etiological and pathophysiological factors; proper treatment depends on proper diagnosis; and the diagnosis is linked to prognosis.<sup>21,60,61</sup>

The system distinguishes between six subgroups of feeding disorders: (1) feeding disorder of state regulation, (2) feeding disorder of reciprocity (also named "feeding disorder of caregiver-infant reciprocity"<sup>59</sup>), (3) infantile anorexia, (4) sensory food aversions, (5) feeding disorder associated with a concurrent medical condition, and (6) post-traumatic feeding disorder (also named "feeding disorder associated with insults to the gastrointestinal tract"<sup>59</sup>). Although the subgroups include overlapping symptoms and some overlapping criteria for impairment, the sub-categories are distinguished by the different symptoms and impairment combinations.<sup>62</sup>

Since the initial publication of Chatoor's proposed classification system, the criteria have been modified by the American Academy of Child and Adolescent Psychiatry's Task Force for Diagnostic Criteria: Infants and Preschool that are included in the developmentally-based classification book *Zero to Three*,<sup>59</sup> specifically designed for diagnosing mental health and developmental disorders in infants and young children. All six subgroups of feeding disturbance are included under the general heading "Feeding Behavior Disorder," which relates to difficulty in the child's not regulating feeding in accordance with physiological feelings of hunger or fullness. The clinician is advised to consider a primary feeding disorder if the feeding difficulties occur "in the absence of hunger and/or interpersonal precipitants," such as separation or trauma.<sup>59</sup>

This system of subgrouping distinguishes between different types of feeding disturbance and goes beyond the DSM-IV-TR requirement of "persistent failure to eat adequately with significant failure to gain weight or significant loss of weight" as the principal presenting feature in the diagnosis of feeding disorders.<sup>11</sup> Although Chatoor and colleagues report excellent inter-rater reliability for four diagnoses (infantile anorexia, sensory food aversions, post traumatic feeding disorder, and feeding disorder associated with medical condition),<sup>62</sup> their observations are largely limited to a single clinical setting and at present there is limited research from other investigators examining the proposed subtypes of feeding disorders, their sug-



gested treatment programs, or treatment outcomes. Chatoor has recently published further detailed descriptions of clinical presentation, course, etiology, and treatment for each of the six proposed types of feeding disorder with the explicit aim of guiding practitioners in the field and stimulating further research.<sup>63</sup> Davies and colleagues have criticized this subgrouping approach arguing that it acknowledges systemic influences only after diagnosis, and therefore, does not consider the interactions within the home, which they assert are often the main component to feeding disorders.<sup>22</sup>

Complex Bio-Behavioral Pediatric Feeding Disorders<sup>15</sup>: Burklow and colleagues defined five categories of factors in complex feeding problems derived from “previous descriptions and classification attempts (of feeding disorders), with further elaboration based on clinical experience”<sup>15,64–66</sup>: (1) structural abnormalities, (2) neurological conditions, (3) behavioral and psychosocial issues, (4) cardio-respiratory problems, and (5) metabolic dysfunction. The authors recognized that previous categorical classification attempts had failed to capture the mixed etiologies of feeding problems, and proposed that these five categories are not mutually exclusive. In a study of 103 children aged 4 months to 17 years (67% of whom were under 3 years of age) referred for concern related to poor oral intake and problems sustaining growth, the following combination of the five categories were found: structural and neurological and behavioral (in 30% of the sample), neurological and behavioral (27%), behavioral (12%), structural and behavioral (9%), and structural and neurological (8%). Overall, behavioral issues were reported most often (in 85%), compared with neurological conditions (73%), structural abnormalities (57%), cardio-respiratory (7%), or metabolic dysfunction (5%).<sup>15</sup>

This classification system considers feeding disorders as bio-behavioral conditions, so that both biological and behavioral factors must be considered to assess and treat the feeding disorder successfully. This system is appealing in that it has the potential to capture mixed etiology and a plethora of differing symptoms and it emphasizes two fundamental points to be considered in any revision to the DSM system for feeding disorders: there is a major behavioral component to the majority of feeding disorders, and biological and behavioral components and their interaction are considered in diagnosis. However, it is based on a relatively small sample of patients, and there is no supporting evidence in the literature regarding treatment outcome or any other validation. A puzzling feature

is the lack of any obvious category to include gastroenterological conditions.<sup>4</sup>

Behavioral Pediatric Feeding Problems<sup>67,68</sup>: Crist and Napier-Philips used a standardized feeding assessment questionnaire (BPFAS—Behavioral Pediatrics Feeding Assessment Scale) to empirically derive subtypes of feeding disorders from a sample of 96 control and 249 clinically referred subjects.<sup>68</sup> The BPFAS is a 35-item parent questionnaire that measures mealtime behaviors in young children (9 months–7 years of age) as well as parent and child behaviors associated with poor nutritional intake. A principal-components analysis identified five common patterns of problematic feeding behavior, referred to here as: (1) Picky eaters, (2) Toddler refusal-general, (3) Toddler refusal-textured food, (4) Older Children refusal-general, and (5) Stallers.

This system is based on sub-grouping based on presenting behavioral features only. Interestingly, the study found that the difference between children with feeding problems and controls lay in the parental report of problem behavior frequency, rather than in the nature of the behaviors per se.<sup>68</sup> This raises questions regarding what is being measured and whether this instrument should form the basis for diagnostic sub-grouping. Also, the five identified groups account for only 55% of the total variance, suggesting limited utility. Finally, there is a lack of subsequent research supporting this system as a useful means of classifying feeding disorders.

Food Refusal Behaviors<sup>69</sup>: These authors state that the DSM-IV FD criteria and the associated descriptions are ambiguous and propose that this has resulted in many different interpretations of the criteria by clinicians and a confused field of research. They suggest an alternative classification scheme focusing on subtypes of food refusal behaviors, acknowledging the work of Chatoor and Ganiban,<sup>70</sup> and claiming to extend on the latter's contributions with a view to better reflecting what is observed in clinical practice. They propose five categories of food refusal behaviors: (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. These five groups are based on the authors' analysis of the existing literature and they suggest that different intervention strategies are likely to be required to improve the child's feeding. Although the proposals put forward by these authors are theoretically appealing, and their suggestions on how to help move the field forward through collaborative research are sound, there are currently insufficient data to validate the proposed food refusal categories. In addition, as is

the case with AN, the use of the term “refusal” is somewhat problematic.<sup>71</sup>

### **Pica**

Pica is the diagnostic term for a specific form of eating disturbance characterized by the ingestion of nonfood, non-nutritive substances, for at least 1 month. Current DSM-IV-TR criteria specify that this must be inappropriate to the individual's developmental level, and exclude ingestion related to the normal tendency of young children to mouth and suck objects. The ICD-10 diagnostic criteria for pica specify a minimum age (chronological or mental) of 2 years with no upper age limit; pica in adults is currently listed as an example of “Other eating disorders” (F50.8) within Eating Disorder diagnoses (F50).<sup>9</sup> Although DSM-IV-TR includes pica as a “disorder usually first diagnosed in infancy, childhood, or adolescence,” it is clear from many case reports in the literature that pica is often first diagnosed in adulthood.<sup>72</sup> The continuing placement of pica as disorder under the heading of “infancy or early childhood” in DSM warrants careful consideration in the light of data concerning age of onset and diagnosis.

The main co-morbid presentations of pica are mental retardation and pervasive developmental disorder,<sup>4</sup> but it is also well documented as co-occurring with other mental disorders, such as schizophrenia.<sup>73</sup> Individuals with mental retardation or other pervasive developmental disorders such as autism may have pica as one symptom in a broader range of disturbed behaviors. Current DSM and ICD criteria make it clear that for a person to receive a diagnosis of pica, it must present as a relatively isolated form of psychopathological behaviors, and if it co-occurs with another mental disorder, it must be “sufficiently severe to warrant independent clinical attention.”

### **Rumination Disorder**

RD is included in DSM-IV-TR as one of the “Feeding disorders of infancy or early childhood” yet, as with pica, occurs across the age range. Individuals with this disorder repeatedly regurgitate either swallowed or partially digested food, which may then be re-chewed and either re-swallowed or expelled. Many agree that observing rumination can assist diagnosis, both in adults and in children.<sup>74</sup> RD is expressed slightly differently in older patients. Some authors have noted that adolescents and adults are less likely to re-chew regurgitated material, and that subsequent diagnostic revisions might be reworded to take account of this. Older patients describe making a conscious decision (i.e., whether to swallow or spit out) about the regurgitated material once it is present in the oropharynx; the choice may depend on the social situation.

Older patients also often complain of nausea and heartburn associated with the behavior.

In ICD-10, unlike in DSM-IV, RD is not identified as a separate diagnostic category.<sup>9</sup> Instead, rumination and regurgitation are included as symptoms under the diagnosis of feeding disorder of infancy and childhood (F98.2). Neither classification system explicitly refers to rumination in adolescents and adults. It is clear, however, that the DSM criteria are intended to be applicable to older individuals through reference to AN and BN. Rumination behavior is well documented in patients with these eating disorders.<sup>75</sup>

“Rumination syndrome” also appears as a diagnosis in the Rome III diagnostic system<sup>76</sup> as a functional gastrointestinal disorder (FGID). These are defined as variable combinations of chronic or recurrent gastrointestinal symptoms not otherwise explained by structural or biochemical abnormalities. In the Rome III system, diagnostic features are based on functional symptoms reported by children or their parents rather than on organic disorders. The Rome III criteria for rumination are more specific than those in DSM, and are presented differently for different ages, to include specific criteria for infants and for adolescents.

Rome III Diagnostic criteria for infant rumination syndrome differ from those for DSM-IV RD in a number of respects: (1) a minimum duration of 3, rather than 1 month, (2) no specification for a preceding period of normal functioning, (3) a relatively narrow age at onset specified (3–8 months) unless all other diagnostic requirements are met, and (4) attention is drawn to a lack of distress in the infant, poor interactions with others, and the behavior not occurring during sleep. A number of authors use the term “rumination syndrome” in relation to older children, adolescents, and adults.<sup>75,77</sup> As with the term “feeding disorder,” there is significant variation in the use of the terms “rumination,” “RD,” and “rumination syndrome.”

RD most commonly occurs in the context of pervasive developmental disorders and mental retardation, sometimes for self-stimulation.<sup>78</sup> A range of other psychiatric disorders and symptoms (e.g., depression, anxiety, obsessive-compulsive behavior) has been reported in up to one third of individuals who engage in rumination.<sup>76</sup>

### **Other Childhood Presentations that are Characterized by Avoidance of Food or Restricted Food Intake**

In addition to FD, pica, and RD, currently classified as disorders of infancy and early childhood,

some other conditions typically described during middle childhood and characterized by avoidance of food or restricted food intake also deserve mention. Intake may be inadequate in relation to the range of foods accepted and/or the overall amount in terms of energy (calories). Such presentations may or may not be associated with weight loss, failure to gain weight, or significant growth impairment. In current clinical practice, some of these presentations receive a diagnosis of eating disorder not otherwise specified (EDNOS); yet, it is far from clear whether this is appropriate as they are not characterized by weight and/or shape concerns. Terms used to describe such presentations include the following: food avoidance emotional disorder<sup>79,80</sup>; restrictive eating<sup>81</sup>; selective eating<sup>40,82,83</sup>; choosy eating<sup>84</sup>; perseverant eating<sup>85,86</sup>; sensory food aversions<sup>21</sup>; chronic food refusal<sup>87</sup>; food neophobia<sup>88,89</sup>; functional dysphagia<sup>90</sup>; and childhood phobias leading to compromised intake<sup>91</sup> (e.g., fear of vomiting, fear of defecating, fear of bathroom, etc.). Careful reading of the clinical descriptions in the existing literature suggests that it might be possible to distinguish three main subtypes within these childhood restrictive/avoidant eating disturbances that are distinct from childhood presentations of an eating disorder in that there is no evidence of weight/shape concerns.

**Presentations Characterized by Inadequate Food Intake.** One of the better described presentations characterized by inadequate overall energy intake in children is food avoidance emotional disorder (FAED). Higgs and colleagues<sup>79</sup> introduced this term to describe a group of children with inadequate food intake and emotional disturbance who did not meet criteria for AN. This group was described as presenting with “a disorder of the emotions in which food avoidance was a prominent feature in the presenting complaint,” further characterized by having “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.”<sup>79</sup> The original description has been adapted by Bryant-Waugh and Lask in the Great Ormond Street Hospital checklist.<sup>92</sup> The avoidance of food is regarded as emotionally based, but not with a specific motive in mind. There is no evidence that the child’s restricted intake is for example motivated by a desire not to gain weight, or to avoid vomiting, etc. Children with FAED are described as experiencing emotional problems, for example sadness, worries, or obsessiveness that interfere with their appetite and eating. Casper

refers to the eating disturbance as one of a number of anxiety-based behaviors, which may include school avoidance.<sup>93,94</sup> However, the significant weight loss or poor eating tend to bring the child to clinical attention more than manifest anxiety. Children with FAED have been shown to be more likely to experience generalized anxiety unrelated to food than those with AN.<sup>95</sup> It is generally recommended that treatment should focus on the associated emotional disturbance as well as the weight loss associated with eating difficulties,<sup>96</sup> although there are no well-conducted treatment trials to substantiate this. In the original article, children with FAED were described as seem to have a worse prognosis in relation to psychological outcomes than expected for childhood emotional disorders.<sup>79</sup>

The limited available evidence suggests that the term FAED is not used in pre-school children, most commonly being associated with school-age children, to include adolescents. It may be a later variant of “infantile anorexia”<sup>59</sup> or “restrictive eating”<sup>92</sup> (also eating disturbances characterized by inadequate intake with an apparent lack of interest in food), but at present, beyond similarities in clinical descriptions, there is no evidence to substantiate this. There has been some suggestion that FAED might be a precursor to AN,<sup>93</sup> but there is insufficient evidence to support this. There has also been some suggestion that FAED might be a childhood variant of a somatoform disorder; Bryant-Waugh and Lask have observed that many children with FAED do have a history of physical illness, or medically unexplained symptoms.<sup>92</sup> Christie and colleagues note that FAED is more common in girls and that children with this disorder tend to have been previously physically unwell.<sup>97</sup>

There are limited incidence and prevalence data on FAED. A cohort study of 126 patients referred to a specialist children’s Eating Disorder Service for 8–14 year olds identified 88 children with a premenarchal onset of eating disturbance. Of these, 43% received a diagnosis of AN, 29% were described as having FAED, 19% as selective eaters, and 9% as having another eating disturbance such as functional dysphagia.<sup>98</sup> Much of the work relating to FAED since its original description has come from the Great Ormond Street group, making it difficult to generalize findings. However, FAED has more recently been identified in the Pediatric Surveillance Studies carried out in Canada and Australia, as well as the UK,<sup>99</sup> and the term is recognized and used by authors in the United States,<sup>93</sup> also being mentioned in the American Psychiatric Association’s guidelines for the treatment of eating disorders.<sup>95</sup>



**Presentations Characterized by Restricted Range of Food Intake.** Another common childhood presentation is an apparent aversion to or avoidance of certain foods. This may be related to the appearance, smell, texture, taste, and/or temperature of food. Chatoor has proposed the term “sensory food aversions” to describe such presentations based on her work with infants and toddlers, but has not included in some published definitions children who refuse food on the basis of temperature or appearance.<sup>59</sup> Many children who are extremely sensitive to smell, taste, appearance, or other sensory characteristics will refuse substitutions of preferred foods on the basis of smell, taste, or appearance, although subtle differences in these features may not be discernable to most people. Such children cannot be easily encouraged to accept substitutions by withholding preferred foods.

In clinical settings, these children may present eating only foods of a particular color (e.g., white or bland colored foods such as milk, bread, plain cookies, plain pasta, etc), or texture, for example still on purees, never having managed to negotiate the normal developmental stage of moving on to mixed texture foods. Some children will only accept a very narrow range of foods based on the appearance of packaging or insist on one brand only. In some cases, only cold or hot foods are accepted. Finally, there are children who are unable to tolerate the smell of foods that are not part of their diet to the extent that they are completely unable to eat with family, peers, or others. The common factor in these presentations is an avoidance based on sensory features.

Depending on the specific nutritional composition of the accepted diet, these children may experience nutritional compromise, extreme lethargy, and concentration problems, and may have adverse consequences in relation to growth and weight gain. Children who will only accept purees and smooth textures may have immature oral-motor skills as they have not learned to chew, which may adversely affect speech. Children with these restricted ranges may experience significant social problems, be at risk of being bullied, and as they grow older become embarrassed and secretive about their eating. Parents of such children often experience significant anxiety and frustration, in some cases leading to stress and discord both between parents and between one or both parents and the child. In turn, this tends to exacerbate the situation.

Clinical terms used to describe these children include: selective eating (very narrow range of accepted foods, often brand specific); perseverant

eaters (e.g., still on purees or baby jars); food neophobia (aversion to trying new foods to extend dietary repertoire); and sensory food aversions (refusal of specific foods with specific taste, texture, smell). Exploring similarities and differences in use of these terms produces mixed results. Selective eating is the term used by a number of authors to refer to an eating disturbance characterized by the eating of a very restricted range of foods.<sup>92</sup> In the vast majority of cases this is longstanding. Jacobi et al. report that parent-identified “picky eating” is associated with a consistent pattern of inhibited and selective eating beginning in infancy.<sup>100</sup> The relationship between picky eating, selective eating, and neophobia is unclear. Timimi et al. suggest that neophobia and selective eating can be distinguished, as the former is a rejection of new foods, whereas selective eating involves a rejection of many foods that may be familiar to the child. They define selective eating as a specific and persistent pattern of refusal to eat any foods outside of a limited range of preferred foods. Accompanying symptoms in their cohort study included mealtime disruptive behaviors, gagging, excessively slow eating, and difficulties in swallowing. The authors noted heightened anxiety, obsessive-compulsive symptoms, and frequent social and school difficulties. Nicholls and colleagues have also noted that anxiety is common in selective eaters.<sup>83</sup>

**Presentations Characterized by Avoidance Due to Specific Fear.** Functional dysphagia, a specific fear of swallowing that usually leads to limited food intake and is often accompanied by weight loss, has also been referred to as *globus hystericus*. In general, these children are fearful of eating, and in particular of eating lumpy or solid foods. They do not want to put food into their mouths or swallow it for fear that it may cause them to gag, choke, or vomit. These children are not preoccupied with their body shape and do not want to lose weight. They may have experienced some traumatic incident that has triggered the phobia (in the Zero to Three system, this presentation is termed Feeding Disorder Associated with Insults to the Gastrointestinal Tract).<sup>59</sup> Alternatively, they may have made a peculiar or illogical association in their mind that may lead to them developing the phobia.

There are also a number of case reports in the literature and descriptions of children who present with food refusal or avoidance related to other specific fears (e.g., of vomiting, poisoning, carcinogens, defecation, bathroom, etc). Many of these children present in an acutely unwell state, often having lost a considerable percentage of their body weight. In most instances, they respond well to



standard treatment for a phobia, including desensitization, gradual exposure, and anxiety management. However, because of the prominence of the eating disturbance and low weight, such patients often get confused with those who have AN and are referred to eating disorder clinicians.

## Discussion

Examination of the available literature has identified a number of problem areas related to the three existing diagnostic categories that have been reviewed, FD, pica, and RD. Additionally, it has highlighted inconsistencies in terminology and the detail of description of a number of types of eating disturbance commonly seen in childhood, which currently have no place in the classification scheme.

### ***Summary of Key Problem Areas in Feeding Disorders in DSM-IV-TR Classification***

One of the key problems with current criteria is the fact that many children are excluded because they do not fulfill the weight criterion, sometimes because of enteral feeding. The studies reviewed above also clearly suggest that a clinically useful classification system should take account of the interaction between biological and psychological factors. Feeding problems often result from multifactorial causes<sup>20</sup> and the classification of disorders based on an organic versus nonorganic dichotomy fails to provide a system that fully represents the often complex interactions between medical problems, family systems, and behavioral difficulties associated with feeding disorders.<sup>101</sup> In addition, the presence or absence of medical conditions often is not the most important key to successful treatment approaches. Considering these factors, it is often difficult to “rule out” a medical condition (absence of proof does not constitute proof of absence of a condition, and few tests have 100% sensitivity), and often a previously existing medical condition that has since resolved may have initially triggered symptoms and behaviors of a feeding disorder that subsequently were maintained because of conditioned responses or other dynamics related to the interplay of physiology and psychosocial issues.

The variety and complexity of feeding and eating problems in children has undoubtedly contributed to the ongoing lack of any one classification system being widely accepted and used by clinicians from

different 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 with as a result of significant diagnostic inconsistencies. To date, there is a very limited body of data-based research which attempts to examine 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 consistently used assessment measures. The field lacks detailed description and evaluation of specific interventions for presentations of clearly identified typology. 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.<sup>22</sup>

### ***Options for Feeding Disorders***

In light of these considerations, some changes to the current criteria seem warranted. If feeding disorder of infancy or early childhood is retained as a diagnosis in DSM-V, it would be possible to make minor amendments to phrasing to address some of the more obvious problems—e.g., the relative importance of a behavioral disturbance, rather than weight loss, and to address fact that a medical condition may well have played some part (see Appendix). Another possibility would be to separate out, either by text description or as formal subtypes (as in AN and BN being subtypes of eating disorders), three broad types of “psychiatric” feeding disorder consisting of children who: (1) do not eat enough/show little interest in feeding, (2) only accept a limited diet in relation to sensory features, (3) refuse food related to an aversive experience. There is some evidence to support this suggestion, and it has the added advantage of mapping on well to the existing Zero to Three classification system (infantile anorexia, sensory food aversions, and post-traumatic feeding disorder, respectively), as well as to the main types of eating disturbance seen in older children as described earlier. In addition, in DSM-V, it may be helpful to guide the clinician to consider key dimensions in determining risk and clinical severity. In practice, four main parameters appear important.

- a. Nutritional adequacy of diet.
- b. Impact of feeding disturbance on weight, growth, and physical development (to include oral-motor skills),

- c. Impact of feeding disturbance on social and emotional development.
- d. Impact of feeding disturbance on interaction with caregiver and family function.

### ***Summary of Key Problem Areas in Pica in DSM-IV-TR Classification***

Pica occurs across the age range suggesting its placement in the classification system needs to be re-evaluated. Its occurrence in older individuals is inherent in the current wording (e.g., in the mention of schizophrenia in criteria), but this is not immediately apparent to the clinician based on placement in the system. There has been some suggestion that pica might be better classified as an “obsessive-compulsive spectrum disorder.” This suggestion is based on the evidence regarding response to SSRI’s, and observation of compulsive, anxiety relieving components of the eating disturbance. There is also a suggestion that there are two main types: “voluntary” and “involuntary.” However, this distinction has not been rigorously examined, and there seems at present insufficient evidence to justify formally splitting into subgroups. The main proposed change is to alter the placement of pica in the classification scheme so that it is not located under the heading Feeding and Eating Disorders of Infancy or Early Childhood. Slight amendments to criteria are also proposed (see Appendix).

### ***Summary of Key Problem Areas in Rumination Disorder in DSM-IV-TR Classification***

As with pica, RD occurs across the age range (and is expressed slightly differently), again suggesting that its placement in the classification system might usefully be re-evaluated. Re-chewing is less commonly reported in older patients of normal intelligence who show a tendency to regurgitate and swallow or spit out. Thus, a slight change to wording to the first criterion to accommodate this should be considered, as the current wording requires that re-chewing is present. RD is not strictly a disturbance in eating, but it can have a negative impact on eating, as some patients identify foods they are more likely to regurgitate and may avoid these for social reasons, whereas others avoid eating at certain times for similar reasons. Comparison with other diagnostic systems, which differ on a number of points, requires there to be clear justification for the wording of criteria; in DSM-IV-TR the wording “following a period of normal functioning” differs from other systems and there is no compelling evidence that this is useful.

Current phrasing (“not due to”) also perpetuates a split between mind and body in relation to causation, which is inconsistent with many patients’ histories of earlier reflux. As with pica, it is recommended that the placement of RD in the classification scheme should be changed. See Appendix for suggested rephrasing to wording.

### ***Summary of Key Problem Areas in Relation to Other Childhood Eating Disturbances not Currently Classified in DSM-IV-TR***

There are a number of eating disturbances that typically present in childhood, characterized by avoidance or restriction of intake that are not currently classified in the DSM-IV system, which nevertheless are well recognized by clinicians. These disturbances are not accompanied by expressed weight or shape concerns, and restrictive behaviors do not appear to be related to avoidance of weight gain, suggesting it may be inappropriate to include them as variants of an eating disorder. A number of distinct subtypes of avoidant eating disturbance have been described in the literature, which appear to fall into three main groups (consistent with those described in FD).

### ***Options***

One option would be to add to EDNOS narrative descriptions of the three main subtypes discussed earlier: (i) limited intake associated with generalized emotional disturbance; (ii) limited intake with regard to range associated with sensory sensitivities; (iii) inadequate intake/phobic avoidance secondary to specific identifiable fear. However, the absence of weight/shape concerns, either expressed or observed, characterizes all these food avoidance/restriction disturbances, which might have implications for the fundamental nature of an eating disorder if included in EDNOS. An alternative option would be to create a separate category of “avoidant/restrictive food intake disorder”—with three broadly defined examples as above. This category would be separate from ED’s, and could include patients across the age range, although childhood presentations appear the most common. There is insufficient evidence to create full new diagnostic categories, but the three subgroups that emerge most clearly from the literature could be better described to aid clinicians and stimulate research (which in turn will aid clinicians). It is important to note that there appears to be continuity between well described subtypes of feeding disorder and different childhood presentations opening the possibility for diagnostic groupings that are not defined by age, but where the clinician is guided

to recognize developmental differences in expression.

In summary, this review of the current literature regarding the diagnostic groupings for feeding and eating disorders of childhood documents a number of significant problems, including a wide and inconsistent use of terminology and limited research to guide change. Therefore, changes recommended for DSM-V will likely be intended to provide somewhat clearer descriptive categories consistent with existing knowledge. Hopefully, this will help stimulate additional research on additional and better-validated approaches to categorizing these important problems.

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## Appendix: Options for DSM-V

### ***Feeding Disorder of Infancy or Early Childhood***

- A. Feeding disturbance as manifested by persistent failure to adequately meet nutritional and/or energy needs orally for at least 1 month leading to failure to gain weight or significant loss of weight; faltering growth; significant nutritional deficiency; and/or dependency on enteral feeding.
- B. There is no evidence of organic disease or other medical condition sufficient to account alone for the failure to eat.
- C. The disturbance is not better accounted for solely by another mental disorder (e.g., Rumination Disorder).
- D. The onset is before age 6 years.
- E. If the feeding disturbance occurs in the context of another mental disorder (e.g., Mental Retardation, Pervasive Developmental Disorder), it is sufficiently severe to warrant independent clinical attention.

Text to include description of three main subtypes: children who do not eat enough/show little interest in feeding; children who only accept a limited diet in relation to sensory features; children whose food refusal is related to aversive experience.

### ***Pica***

- A. Persistent eating of nonfood/non-nutritive substances for a period of at least 1 month.
- B. The eating of non-nutritive substances is inappropriate to the developmental level of the individual (a lowest age of 18 months is suggested for diagnosis).
- C. The eating behavior is not part of a culturally sanctioned practice.
- D. If the eating behavior occurs exclusively during the course of another mental disorder (e.g., Mental Retardation, Pervasive Developmental Disorder, Schizophrenia), it is sufficiently severe to warrant independent clinical attention.

***Rumination Disorder***

- A. Repeated regurgitation and/or re-chewing of food for a period of at least 1 month.
- B. The behavior is not better accounted for solely by an associated gastrointestinal or other general medical condition (e.g., esophageal reflux).
- C. The behavior does not occur exclusively during the course of an Eating Disorder, such as Anorexia Nervosa or Bulimia Nervosa. If the symptoms occur exclusively during the course of Mental Retardation or a Pervasive Developmental Disorder, they are sufficiently severe to warrant independent clinical attention.

***Restrictive/Avoidant Food Intake Disorders***

- A. Eating disturbance characterized by restriction or avoidance of food intake resulting in failure to adequately meet nutritional and/or energy needs associated with significant

weight loss (or failure to gain weight or faltering growth in children) and/or significant nutritional deficiency.

- B. The behavior does not occur exclusively during the course of an Eating Disorder, such as Anorexia Nervosa or Bulimia Nervosa.
- C. There is no evidence of organic disease or other medical condition sufficient to account alone for the failure to eat.
- D. If the eating disturbance occurs in the context of another mental disorder (e.g., Mental Retardation, Pervasive Developmental Disorder), it is sufficiently severe to warrant independent clinical attention.

Text to include descriptions of three main subtypes. These can be seen across the age range with developmental variations in presentation. This might include presentations currently classified under feeding disorder.

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