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Comprehensive Treatment of Feeding Aversion in Children

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Feeding problems are real; they are hard-wired and neurological. Their far-reaching effects are nutritional, interpersonal, behavioral and developmental, altering the sense of self and self-esteem, family relations, sociability, as well as academic and professional performance.

Feeding is not only a natural part of life, but also a vital part of life. Without the ability to meet our nutritional needs in some way, our life is in jeopardy. Children progress through the different stages, mastering each one as they go along from bottle or breastfeeding all the way up to solid foods. However, some children struggle with feeding skills from their first day of life. These children require immediate, skilled intervention from medical personnel. Feeding disorders occur with a reported incidence of minor feeding problems ranging between 25% and 35% in normal children and with more severe feeding problems observed in 40% to 70% in infants born prematurely or children with chronic medical conditions (Rudolph).
Children with feeding disorders represent a diagnostic and therapeutic challenge to the pediatric primary care provider. A large proportion of affected individuals also present with significant developmental disabilities and other chronic care issues. Chronically ill children have often been denied typical feeding experiences and may have missed the critical periods of development vital in establishing the foundation feeding skills of the suck/swallow/breathe sequence. The nature of the child's illness may also have a lasting impact on feeding development. Children with developmental disabilities are also at an increased risk for developing feeding-related difficulties, including gastroesophageal reflux, oral motor dysfunction and aversive feeding disorder.

Symptoms of feeding disorders may include extreme food selectivity, food refusal, failure to thrive, oral aversion, recurrent pneumonia, chronic lung disease and recurrent emesis. Anatomic or functional disorders that make feeding difficult or uncomfortable for the child may result in a learned aversion to eating even after the underlying disorder is corrected. Maladaptive behaviors often arise to provide an additional challenge in treatment. The stress of a feeding disorder can dramatically impact the parent-child relationship and a feeding problem may become all encompassing. Treatment programs must switch focus from only the child to include the entire family.

Many of these children have been referred for traditional rehabilitation services for evaluation and treatment. However, the complexity of the disorder often requires multidisciplinary, specialized care from a pediatric feeding team for a successful outcome. Optimally, the team should include the disciplines of speech pathology, occupational therapy, psychology, nutrition, gastroenterology and otolaryngology for the core evaluation. Additional evaluation and support from specialists in radiology, social services, child life, neurology and pulmonary medicine is often used.

Interdisciplinary evaluation facilitates integration of expertise from different disciplines to provide insight into the various factors that interact in contributing to the child's feeding /swallowing

disorder and overall health. Diagnosis specific treatment of feeding disorders often results in significantly improved energy consumption and nutritional status. However, standard treatment often involves inpatient care, which is labor intensive and expensive. Many children have already developed feeding disorders that are highly resistant to intervention. Standard treatment programs are often not available to many people in more rural areas of the country. This article will present an alternative approach to traditional intervention programs.

Pre-Chaining and Food Chaining© Programs

Treatment programs must become pro-active in implementing preventative care programs for at risk or medically fragile children. Treatment should focus on swallowing/feeding therapy and work to prevent feeding problems from developing or preserving existing feeding skills. The novel techniques of Pre-chaining© and Food Chaining © (Fraker/Walbert/Cox) have been developed to treat children with or at risk for developing feeding aversion or severe food selectivity.

Pre-chaining focuses on a treatment program to keep the child as close to the developmental progression of oral skills as possible during the first year of life. For example, a child who is a non-oral feeder may be able to take small amounts of food orally under the supervision of a feeding specialist. This exposes the child to taste daily and helps maintain a single bolus swallow. These are simply "practice feedings" until the child is safe to take food for nutritional intake. The child with dysphagia may be exposed to therapeutic tastes (no more than 5cc) of formula or breastmilk via a dipped pacifier or teether in early infancy and later move to tastes of pureed foods at 6 months. The therapist increases the flavor of the food items according to the normal developmental progression. Amount of liquid or food offered is based on swallowing skill. Texture is provided via textured teether toys and utensils dipped in flavored purees. Intervention during the first year of life focuses on maintaining tolerance of taste and smell of food until swallowing skills improve to allow increased oral intake. Intervention in the first year of life is critical for these preventative care programs. Team members work together to provide mouthing programs, therapeutic tastes and input to the oral facial musculature to keep the child on track developmentally as much as possible until swallowing skills improve to the point that increased oral intake is possible.

Food chaining© is a therapy program that uses foods as desensitization and/or as therapy tools in treatment. The therapist analyzes the current food repertoire of the child to determine similarities in taste/texture/temperature. Accepted, previously accepted and rejected food items are analyzed and compared in regard to characteristics of consistency, flavor and texture. Utensils and bottle nipples, pacifiers and cups are analyzed for texture, flow rate and also used as therapy tools. The currently and consistently accepted foods/liquids comprise the "core diet." Core diet items are analyzed and then linked to foods with similar characteristics. Some of the core food items may also be slightly modified to work toward the goal of expanding the number of accepted foods in the diet. Food chaining reduces the risk of refusal because food items are selected based on the child's preferences. New foods are introduced gradually and rated by the child on a 1 - 10 scale (1, low approval to 10, high approval). Foods rated "4" or above are reintroduced. Food chaining is only one part of a comprehensive treatment program and is multidisciplinary in implementation. Food chains are customized to each child and may be developed for children with dysphagia, moderate to severe aversions, sensory or behavioral based food refusals. Food chaining calendars are created for family so as not to overwhelm the child with change. Parents are advised that food chaining demands patience and commitment from the family to make a change that lasts.

Tech Therapy

Another novel aspect of this treatment program is the use of modern technology. Videotaped feedings in the home environment are analyzed and used to provide a more in-depth analysis of the true nature of the feeding disorder. In order to determine the relative contribution of each of these impediments, feeding team members observe mealtimes at home (through videotaping) as well as in a clinic setting. Observers focus on parent/child interaction, pacing and duration of mealtime, feeding environment (including distractions, appropriate feeding utensils and set-up

[seating, high-chair]), and child autonomy. Abnormal parent/child interactions may include force-feeding, under- or over-attentiveness to cues, inappropriate menu selection and portion size, lack of reinforcement of desired behaviors and inappropriate reinforcement of negative behaviors. Based upon this evaluation, members of a feeding team develop a treatment plan that helps the child reach his optimal feeding potential. Of equal importance, feeding team members must help to meet the needs and expectations of the child's parents.

Outpatient treatment with a focus on preventative care is often beneficial for children with long-term habits or significant medical or sensory-based issues. Communication and contact with families may take place by direct service, or by telehealth techniques of videotaped meals in the home environment. This provides an opportunity to evaluate the child's feeding behaviors in their natural feeding environment while allowing access to patients in more regional areas. Videotapes are submitted for re-evaluation and monitoring as well as communication with family and local/treating therapy team by phone, e-mail and voice mail.

Summary of Research on Food Chaining©

Food chaining was presented as an evidence-based treatment technique at the World Gastroenterology, Hepatology and Nutrition Conference in Paris,
France in July 2004. A retrospective study of 6 males and 4 females ages 1-14 years with a median age of 3 years was completed between September 2001 to June 2003. Diagnoses included: cleft palate, dysphagia, microgastria, cerebral palsy, BPD, congenital heart disease, autism and renal insufficiency. Eight of the ten children in the study had received more than 6 months of feeding therapy prior to starting the food chaining program. Accepted food items were recorded at enrollment and 3 months later by paired t-test. Therapy sessions consisted of ½ hour to 2 hours of direct and/or consultative patient contact per week. Diet was successfully expanded in all cases. There were no treatment failures.

Figure 1. How Food Chaining Works
The following food chains were developed for a child who accepted only three foods initially: animal crackers, applesauce and juice. The chains were designed to expand the child's food repertoire and increase acceptance of various flavored and textured foods. Upon completion of the initial phase of the "food chaining" program, the child was accepting close to thirty foods and seven liquids.

Diagrams of food chains

Accepted Food: Animal crackers-Goal: Expand Food Repertoire

This food chain commenced with the accepted food and was advanced by adding other foods that were also slightly sweet and crunchy. Initially, slightly sweet foods were replaced by salty foods. Later, alternate food flavors and textures were introduced.
Food Chain Progression
Animal Crackers (currently accepted)

Graham crackers, Teddy Grahams®, shortbread cookies, peanut butter cookies, club crackers

(peanut butter cookies precede peanut butter crackers and start transition to salty flavor)
(cheese introduced)

Cheese with crackers

Ritz® crackers

oyster crackers

Saltine crackers

(cheese reintroduced)

Cheese quesadillas

(combined 2 textures)

Saltines with cheese or peanut butter

Toast with peanut butter or toasted cheese

(toast introduced prior to bread due to preference for crunchy foods)

Peanut butter and jelly sandwich.

Accepted Food: Applesauce-Goal: Advance Texture to Solids
This chain, which was designed to bring solid foods into the child's repertoire, began with applesauce and progressed to solid apples.

Food Chain Progression
Applesauce (accepted food)

Other flavors of applesauce
Chunky applesauce (may have to mash chunks with fork at first or cut into tiny slivers)

Chunky cinnamon or flavored applesauce

Soft apple slices of apple pie, fork mashed (may need to mix applesauce in with some children)

Larger pieces of baked apple or slices from apple pie (may supplement with ice cream to enhance "milk chain" below)

Very thin slice of raw apple dipped in applesauce

Raw apple slice

Accepted Liquid: Juice-Goal: Introduce Milk
This food chain was designed for a child who preferred to drink juices and carbonated beverages over milk.

Liquid Chain Progression
Juice

Different flavors/brands of juice

Juice with 1 tsp. of orange sherbet or pureed fruit added to increase consistency

Juice with increased amount of pureed fruit or sherbet mixed in

Ice-based fruit smoothie

Ice-based fruit smoothie with 1 tbsp. drinkable yogurt

Fruit juice with increasing amounts of drinkable yogurt

Yogurt or ice cream based fruit smoothie

Strawberry milkshake

Strawberry milkshake/strawberry flavored milk (gradually thin out and increase milk)

Strawberry milk (gradually fade strawberry flavoring)

Regular milk and 2 tbsp. vanilla pudding added

Regular milk

Suggested Readings

1.Fraker C and Walbert L, Evaluation and Treatment of Pediatric Feeding Disorders: From NICU to Childhood. 2003, Pro-Ed.
2. Fishbein, M., Fraker, C, Cox, S, Walbert, L, Journal of Pediatric Gastroenterology and Nutrition, Volume 39, Supplement 1, 2004 Food Chaining: A Systematic Approach for the Treatment of Children with Eating Aversion
3. Schwarz SM et al., Diagnosis and treatment of feeding disorders in children with developmental disabilities, Pediatrics, 2001;108:671-6.
4. Rudolph CD and Link DT, Feeding disorders in infants and children, Pediatric Clinics of North America, 2002; 49:97-112.
5. Manikam R and Perman JA, Pediatric feeding disorders, Journal of Clinical Gastroenterology, 2000; 30:34-46.
6. Kedesky J and Budd K, Childhood Feeding Disorders: Biobehavioral Assessment and Intervention. Baltimore, Maryland. Paul H Brookes Publishing Company; 1998.
7. Fishbein, M., Fraker, C, Walbert S; Food Chaining: The Proven 6-Step Plan to Stop Picky Eating, Solve Feeding Problems, and Expand Your Child's Diet. January 2007