



Nutricia Learning Center
Specialized Nutrition Education - Helping You Help Your Patients

Setting the Table: Initial Steps Towards Achieving Adequate Nutritional Intake in children with Autism Spectrum Disorder (ASD) and Gastrointestinal Issues (GI)/Food Allergies

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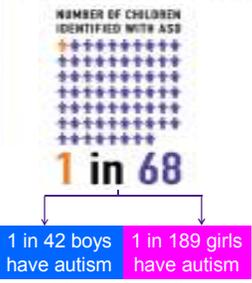


Webinar Objectives

1. Define autism diagnostic characteristics and how these relate to the mechanics of eating.
2. Discuss the most common disrupted eating patterns in children with autism.
3. Identify prevalent underlying medical problems such as GI issues and food allergies that may contribute to disrupted eating patterns in children with autism.
4. Identify strategies to support mealtime and foster adequate nutritional intake and growth in children with autism.



2014 U.S. Autism Prevalence



2 core features/deficits: DSM 5

- A. Social-communication and interactions
- B. Restricted interests/ repetitive behaviors
 - Note: Unusual sensory behaviors are explicitly included within a subdomain of stereotyped behaviors.

Symptoms present in early childhood

CDC Press Release, March 27, 2014
<http://www.cdc.gov/media/releases/2014/s0327-autism-spectrum-disorder.html>

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (5th Ed). Arlington, VA: American Psychiatric Publishing, 2013.

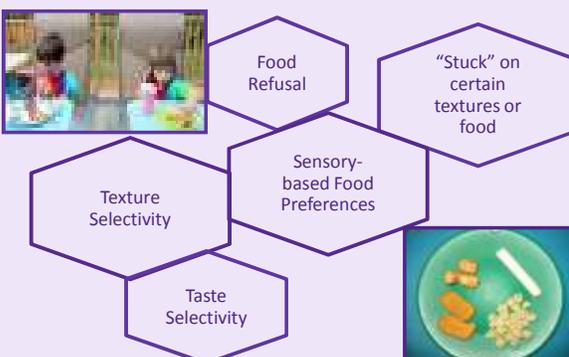
- Autism is ~5 times more common among boys than girls



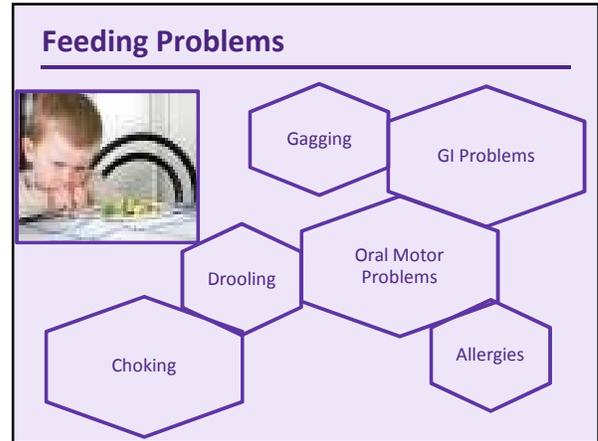
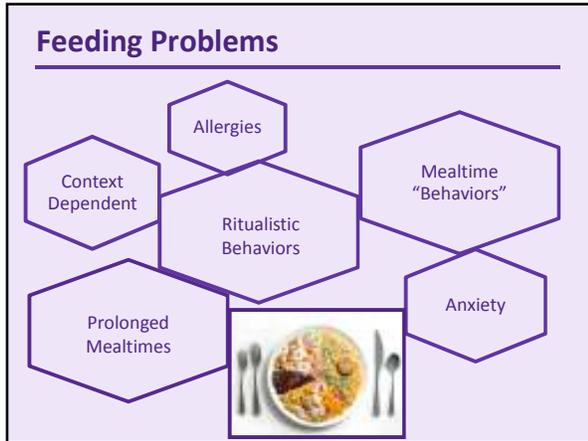
Autism and Feeding Challenges

- Disrupted feeding patterns first described in original disorder description¹
- 46 to 89% of children with autism have feeding challenges²
- Children with autism are 5 times more likely than their peers to have significant feeding challenges³
- Children with autism and feeding challenges are at risk for detrimental medical, developmental, and social outcomes⁴⁻⁷

Feeding Problems







Autism and Feeding Problems

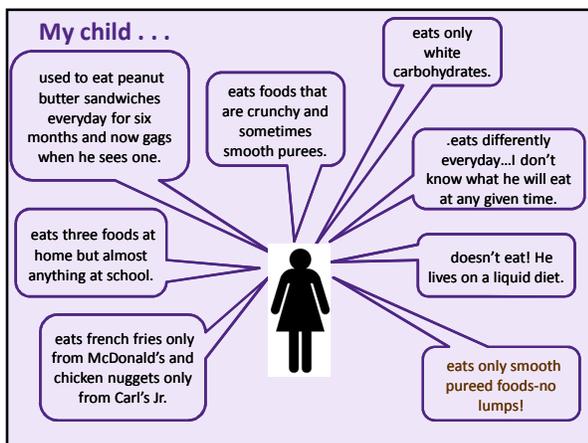
NLC

- Most common reported feeding challenge based on food selectivity, texture selectivity, and food refusal^{8,9}
- Eat a very narrow variety of foods, with 60% eating fewer than 20 different foods¹⁰ and 57% demonstrating low food acceptance¹¹
- Intense food cravings and extended food jags (eating only one or two foods) are also reported to be problematic¹²⁻¹⁴

Autism and Feeding Problems

NLC

- Layered challenges in addition to primary concerns, often sensory, such as prolonged mealtimes, neophobic behaviors, oral motor problems, related physiological challenges (e.g., drooling, gagging, and choking), and only eating food prepared or presented in a very particular way^{2, 12, 13, 14-17}
- *Underlying medical issues* such as GI problems and/or food allergies have a higher prevalence in autism
 - Can impact eating, growth, and may be the primary cause of behavioral feeding challenges¹⁸⁻²⁰



Autism and Feeding Problems

NLC

- Multiple "feeding problems"
- Consider hidden barriers to eating
- Child's history (developmental and medical)
- Impact of feeding problem on child, siblings and caregivers

Family Mealtimes and Routines when a Child has Autism and Feeding Problems 

- Mealtimes are an important daily family routine. These routines support language development, physical health, academic achievement and socialization²¹⁻²⁵
- Mealtimes provide an opportunity for a daily structured routine for families often supporting larger family goals and communication^{25,26}
- Mealtime conversations for families with children with autism included recalling the events of the day and planning future family events²⁷

Family, Autism, and Feeding Problems 

- Typical structure of mealtimes places significant demands on the social-communication skills, behavioral rigidity, and sensory processing deficits that are the core characteristics of autism
- Having a child with autism can disrupt family mealtimes
 - Parent may feel like they need to be a “short order cook” to deal with their child’s food refusal
 - Child may need a high amount of assistance
 - Child may demonstrate challenging behaviors

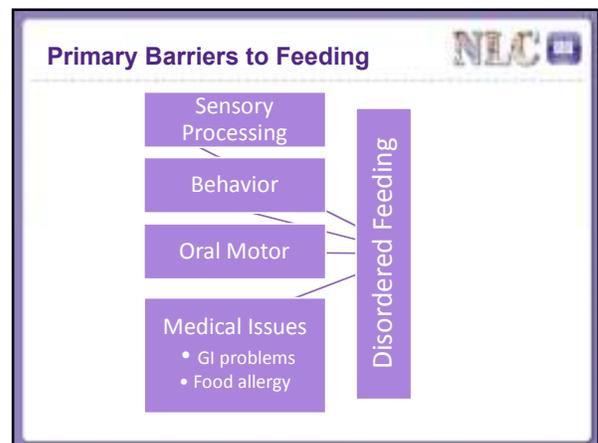
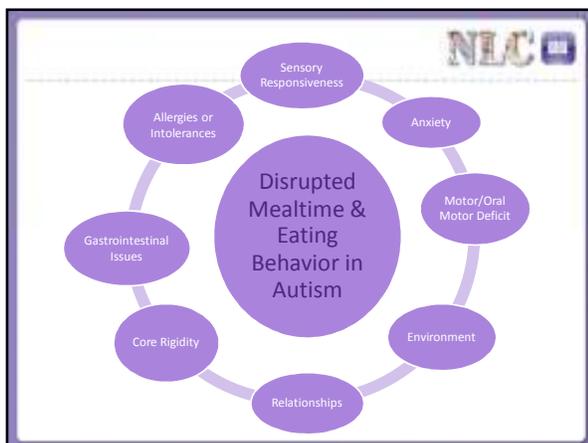


Family, Autism, and Feeding Problems 

- Maladaptive behaviors such as tantrums, unwillingness to sit at the table, throwing or spitting out food disrupt mealtime and interfere in the parent-child interactions.^{13, 15, 16, 28, 29}
- In a study of family routines, 92% of study participants classified dinnertime as the most stressful part of day, with one mother describing it as “hell on earth.”³⁰

Family, Autism, and Feeding Problems 

- Family mealtime routines are often based entirely around the needs and behaviors of the child with autism, and neglect the needs of other family members.
- Impacts entire family unit³⁰⁻³²

Sensory Processing and Eating

- Child's ability to organize their behavior to participate in eating
- Response to eating, the environment and food properties
- Decreased or altered sense of appetite and satiation
- Consideration of the complex interaction among the **child, food,** and **environment** for functional experiences



Sensory Patterns



Hyperresponsiveness

- Over-reactivity to stimuli

Hyporesponsiveness

- Under-reactivity to stimuli

Sensory Seeking

- Fascination with or craving certain stimuli

Enhanced Perception

- Heightened awareness

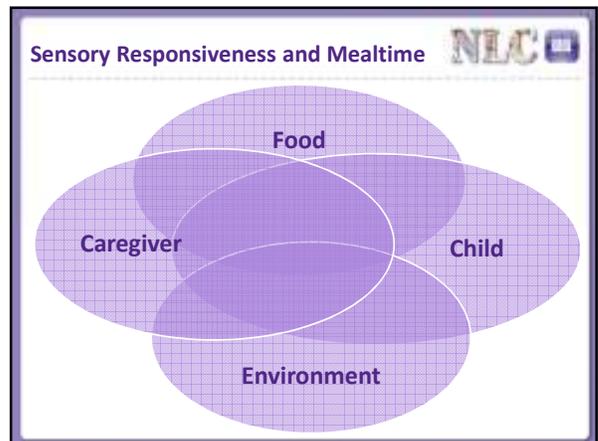
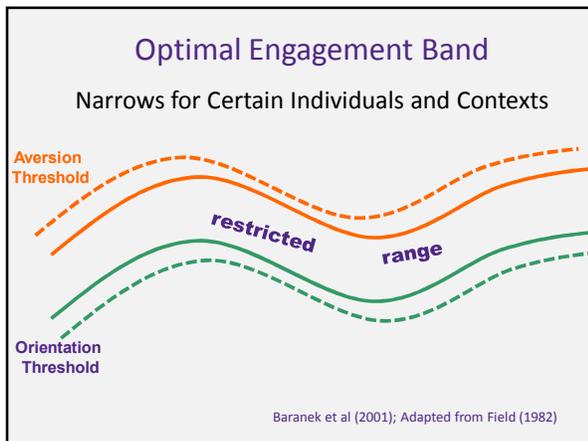
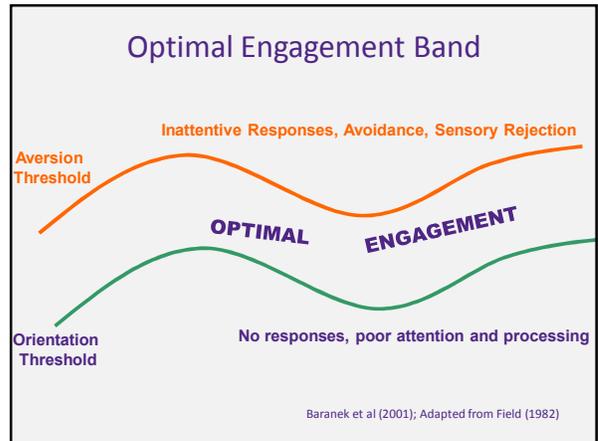
Sensory dysfunction significantly impacts child occupations, specifically eating and mealtime.

Sensory Responsiveness

Children with autism have varying perceptions and responses to food properties

For Example . . .

- Smell
- Taste
- Texture
- Visual Properties
- Temperature

Behaviors, Feeding, and Autism



Gagging

Rigidity Food Refusals
Tantrums *Throwing Food*
 Vomiting Spitting *Grazing*

Everything *has to be* the same . . .

Demanding

Identified as a primary problem, but can be the behavior manifestation of a different problem such as sensory challenge or pain and discomfort

Oral Motor Skills, Feeding, and Autism



Oral Motor Difficulties

Chewing Tongue Mobility Coordination
 Overstuffing Pocketing Low Tone
 Food Falling Out

- Oral motor challenges are less common but can cause significant challenges. They are often overlooked and are not part of the original referral concerns.^{2, 9, 12, 14}

Impact on Diet



- Altered sense of hunger or fullness
- Eating behaviors that are overly dependent on context - location, texture, presentation, etc.
- Excessive Diet Restrictions³³
 - Food Jags
 - Malnutrition
 - Vitamin and minerals (deficient vs toxic)
 - Unbalanced fats (essential vs saturated)
 - Calorie imbalance - too few or too many

GI Issues in Autism



Reported in 23-91% of children with autism compared to typically developing children and to children with developmental disorders (DD)³⁴

- 70% of children with autism
- 42% of children with DD
- 28% of typically developing children



What GI Problems?



- Children with autism are 3 times more likely to experience GI symptoms compared to typically developing children.^{35, 36}

Types of GI problems:	
Gaseousness	Diarrhea
Bloating	Food sensitivities
Constipation	Difficulty swallowing
Abdominal pain	Pain on stooling
Vomiting	



- Bed wetting, soiling pants and poor sleep may be considered a "GI symptom"³⁷

Identifying the Reason(s) for a GI Issue is Often Challenging^{33, 38-40}



- Referrals for medical evaluation are not made
- "Right" medical test(s) not done
- Symptoms may be expressed differently than expected due to:
 - Language deficits
 - Altered body perception
 - Sensory processing disorder
- Symptoms may show up as:
 - Aggression:
 - Self-injurious behavior
 - Sleep disorders
 - Social withdrawal



Case Scenarios



“Ari wakes every night, goes to my room and hits me”
 Dairy-Soy Allergy

“Bianca pushes her stomach against the furniture, floor, people, always seeking sensory input”
 Lactose intolerance

“Jon poops midway through therapy, trying to avoid therapy”
 Constipation from withholding

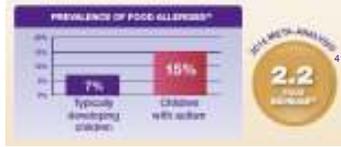
“Lucas’s asthma is requiring nebulizer 3 times per day”
 Reflux from supplement use

Reasons for GI problems

1. Allergies



- An allergy is an immune reaction to a food
- Food allergy symptoms are caused by chemicals (IgE antibodies, histamine) made by the body to protect itself from the food (allergen)
- Reaction can be diarrhea, vomiting hives, swelling
- Food allergy testing (skin prick or blood) may be unreliable (frequent false negatives and false positives)



2. Food Intolerance / Food Sensitivity



- Food intolerance is a non-allergic negative response to a specific food or food component
- Reaction may not be immediate, so harder to identify
- Often causes vomiting, diarrhea or bloating
- Reactions are generally not accurately identified by testing

Examples are:

- Problems **digesting/ breaking** down a food
- Carbohydrate intolerance due to decrease enzymes that breakdown carbohydrates (sugars)
- Most common is lactose (milk sugar) intolerance which occurs more frequently in autism
- Can cause distention and gas

Food Intolerance/Food Sensitivity



- **Immune Sensitivities:** occur at the same frequency in the general population
- **Celiac disease is an autoimmune disorder**
 - Ingestion of gluten leads to damage in the small intestine
 - Diagnosed through testing
 - Treated by avoiding gluten (wheat)
- **Eosinophilic Esophagitis (EoE) is an inflammatory condition of the esophagus that involves eosinophils, a type of white blood cell**
 - Dietary management involves removal of offending allergens and use of elemental formula as supplement or sole source of nutrition



3. GI Tract Structure



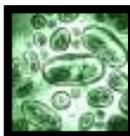
- Inflammation due to an immune reaction (food allergies/intolerances) or genetic differences
- Increased intestinal permeability due to genetics or immune function - “leaky gut”
- Low muscle tone can cause a “sluggish” GI tract^{40, 42-44}



4. Gut Microbiota – Unique to Autism?



- The microorganisms that live in our intestine
- 1/3 is common to most people; 2/3 are specific to an individual (like a unique identity card)
- Microbiota may be distinctive in autism^{40, 45}
 - Influenced by personal biology, genetics, food intake, medications
 - Influenced by and influences allergies, carbohydrate digestion and stool consistency
 - May influence behavior
 - Uncertain if the microbiome can be favorably altered through probiotic use and dietary intake (less processed foods)



What you can do

- Address the potential underlying cause(s)
- Medical assessment
- Nutrition Assessment
- Based on assessments and assumptions; take suspect food out
 - Keep detailed logs of diet, stool, symptoms, skin, sleep and behavior
- Based on medical assessment, nutrition assessment and food diary, address diet *carefully*



Carefully make dietary change

- If you take a food out of the regular diet, you might not be able to add it back in
- If a child is already a “picky eater,” limiting the diet even more increases the risk of
 - Malnutrition
 - Social isolation
- **When making the change consider**
 - Why
 - What
 - When (how long)
 - How

The “How” is DIFFICULT

- Prospective study that considered health, physical and behavioral problems in children diagnosed with autism (n=54)
- Individuals with ASD have behavioral challenges that can interfere with dietary change necessary to resolve GI issues and maintain health

Obsessive/compulsive behaviors	92%
Behavioral problems	89%
Sensory processing issues	85%
Anxiety/Fear	74%
Hooked or fixated	69%
Rigid routines	68%
Demands sameness	67%
Often agitated	59%

Geier 2012

Diet Interventions and Autism

Diet Types	Foods Restricted
Additive free	Food dyes, food additives
Gluten free/casein free	(Staged elimination) 1 st Dairy 2 nd wheat, rye, barley Often soy is restricted (cross-reactivity with cow's milk)
Specific carbohydrate (SCD), FODMAPS, Ketogenic	Fermentable oligo-di-monosaccharides and polyols; disaccharides
Yeast free	Yeast risen breads, fermented foods, cheeses
Evidence-based/Standard of Care: Elimination diets+elemental formula supplementation	Elimination of 8 major allergens -may restricting diet thus limiting variety of foods – use of supplemental elemental formula may be indicated

Nutritional Concerns re: Restricted “Diets”

- Restricting groups of food may remove main sources of key nutrients
 - Ensure adequate intake of ALL nutrients

Restricted Food/Food Groups	Deficient Nutrients
Dairy (all mammal milk)	Calcium, vitamin D, protein, calories
Wheat/Fortified Grains	Iron, niacin, riboflavin, thiamin, folic acid
Whole Grains	Fiber
Carbohydrate restriction	
-Fruits/Vegetables	-Fiber, vitamins C, A, phytochemicals, magnesium, potassium
-Beans	-Fiber, riboflavin, thiamin, folic acid, vitamin B6, protein

Reported decreased bone mineralization in autism

Hediger ML et al. *J Autism Dev Disord.* 2008 38(5):8484-56.
Neumeyer AM et al. *J Autism Dev Disord.* 2013 Jul;43(7):1623-9.

Constipation-Diarrhea: Most Common GI Complaints in Autism

Diet

- (+) Fiber - fruit/veggies, whole grain
- (+) Fluid
- (-) Processed foods, dairy?
- Pica

Biology

- Muscle tone
- Anxiety
- Sensory processing issues

Behavior

- Pica sensory seeking
- Non-effective toileting routine
- Rigidity

Management Considerations GI related issues in ASD



- May need medication (preferably short term)
 - Consider the sensory effect or potential “violence” of laxative effects
 - Consider nutritional side effects of medication
- With food refusal supplementation in short term
 - “Bridging any nutritional gaps” or complete nutrition
 - Utilize preferred flavors/foods for acceptance
 - Mix with food or preferred beverages
 - Gradual dilution
- May need therapy to address
 - Constipation: Anxiety and withholding
 - Manage response to pain/discomfort
 - Introduce new foods

Case Study: Selective Eater



- Jon referred at 21 months for feeding therapy
 - Ate few foods
 - Needed distraction with eating, location specific
 - Selective for type and volume of solids
- Mother (+) history environmental allergies and Crohn’s disease
- Diagnosed with reflux at 2 months of age
- Breastfed until 7 months, transitioned to cow’s milk based formula but was very cranky; vomiting
- Multiple formula changes, soy caused constipation

Selective Eater - continued



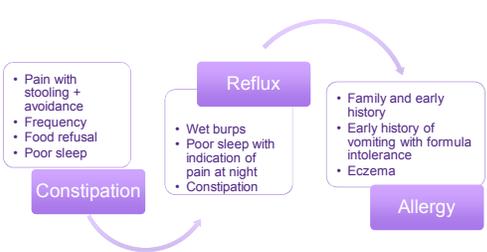
- Current intake:
 - Most of his intake was from a toddler formula by bottle
 - Only 25% of his calories were from food
- Constipation, pain with and visible efforts to avoid stooling
- Withdrawal, tantrums and food refusal would escalate with constipation
- Eczema
- Ear Infections
- “Wet burps”
- Poor sleep, waking up screaming

Selective Eater: Mealtime Experience



- Mother needed to be very vigilant when feeding him as to not spill the food on him. She also said he was a “clean kid” and never had to worry about him getting dirty
- Jon didn’t like lumpy or multi-texture foods, even foods like applesauce-only smooth puree with the exception of a soft egg filled croissant at a coffee shop
- He strongly preferred bland but slightly sweet purees
- He would gag and sometimes vomit would his mother would give him “toddler friendly” foods such as Cheerios
- Even with his preferred pureed solids, his mother would need to put him in front of his favorite TV show to eat “enough”

Selective Eater: Identifying Contributory GI Issues

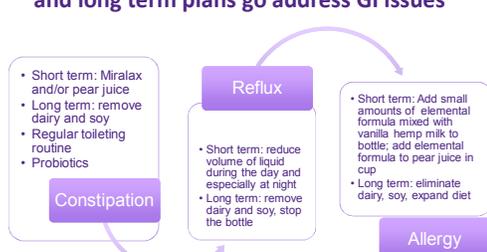



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    graph TD
      Constipation --> Reflux
      Reflux --> Allergy
      Allergy --> Constipation
    
```

- Constipation**
 - Pain with stooling + avoidance
 - Frequency
 - Food refusal
 - Poor sleep
- Reflux**
 - Wet burps
 - Poor sleep with indication of pain at night
 - Constipation
- Allergy**
 - Family and early history
 - Early history of vomiting with formula intolerance
 - Eczema

Selective Eater: Management included short and long term plans go address GI issues

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    graph TD
      Constipation --> Reflux
      Reflux --> Allergy
      Allergy --> Constipation
    
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- Constipation**
 - Short term: Miralax and/or pear juice
 - Long term: remove dairy and soy
 - Regular toileting routine
 - Probiotics
- Reflux**
 - Short term: reduce volume of liquid during the day and especially at night
 - Long term: remove dairy and soy, stop the bottle
- Allergy**
 - Short term: Add small amounts of elemental formula mixed with vanilla hemp milk to bottle; add elemental formula to pear juice in cup
 - Long term: eliminate dairy, soy, expand diet

Selective Eater: Treatment Includes Short and Long Term Plans to Address Sensory, Behavior, and Oral Motor

The diagram features three interconnected boxes: Sensory, Behavior, and Oral Motor. Each box contains specific short-term and long-term goals. Arrows indicate that these areas are interrelated and influence each other.

- Sensory**
 - Short term:** engage in sensory based play in daily routine at the "just right" level
 - Engage in sensory food experiences without the expectation to eat
 - Tolerate small messes at meals
 - Long term:** eat age appropriate food textures, reduce food restrictions, and tolerate small messes during meals
- Behavior**
 - Short term:** have small snacks and small meals without external reinforcement. Encourage engagement through social play in food experiences.
 - Long term:** eat meals with family without TV or other external distractions.
- Oral Motor**
 - Short term:** gradually work on chewing skills and tongue mobility with oral motor games and food based exercises.
 - Long term:** demonstrate age appropriate oral motor skills for developmentally appropriate

Selective Eater: Eats!

- Physician ordered allergy tests which came back positive for soy and dairy
 - This helped family feel that it was worth it to stop the formula
- Stopped the bottle and formula.
- Provided only 4 ounces of pear juice (for constipation) and water
- Within a week of stopping the bottle and formula, his food intake significantly increased
- Sleep improved as did behavior

Moral of the Selective Eater Story

- GI issue was a problem for the family but never identified as a primary problem – no GI referral made
 - Behavioral therapy referral who did not get very far because underlying medical issues/challenges not addressed
- Occupational therapist addressed sensory challenges within and outside of mealtimes
- Oral motor delays that had developed from lack of oral motor and eating experience compounded by sensory challenges
- Ultimately by identifying and treating the GI issue/food allergies, the identified problems resolved and his behavior improved

When to Be Concerned?

- Compromised health*
- Compromised growth and nutrition*
- Further dietary elimination in an already restricted food repertoire
- Diet limits participation in family and peer activities
- Diet is not age appropriate-limits social integration
- Anticipatory concerns
 - Changes in schedule/routine such as school, teacher, family moving
- Increasing demands in other areas of development or life

Make Your Plan

- Identify the goals
 - Short vs long term
- Identify medical issues/health risks
- Assess child's strengths/interests
- Keep detailed diaries
- Identify barriers/challenges and seek evaluations as needed:
 - Medical
 - Sensory
 - Motor
- Connect all "team players"
 - School
 - Therapists
 - Medical/Dental

What can I do?

- Consider the original *cause* for the disordered feeding
 - Think globally
- Start with comprehensive medical workup
 - Referral to appropriate medical specialists
 - "Right" tests, not just tests
- Consider family constellation/resources and support
- Realistic expectations with child's current behavioral challenges and self-restricted diet while prioritizing health concerns and supporting the gut microbiome

What can I do?



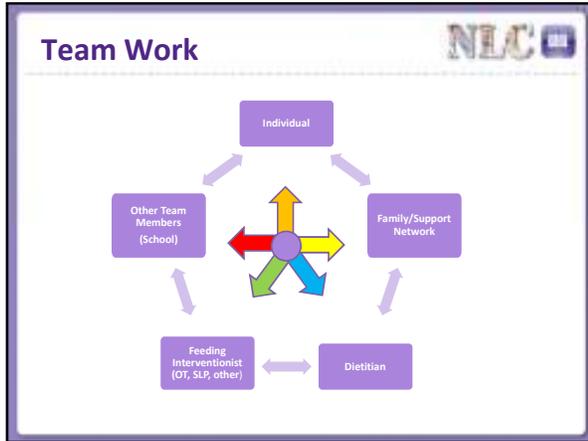
- REALLY consider the child
- Consider child's individual capacities strengths and challenges such as oral motor skills, self-help skills, mental age, chronological age.
- Work within the child's sensory and food preferences
- Communicate and brainstorm with other team members, including caregivers



What can I do?



- Support the child starting at the "just right challenge"
- Break down tasks of desired behavior into small steps
 - Systematic graded approach to introduction of new item (food/drink)
- Repeated exposure
 - Consider fun and engaging food activities that support child and family at mealtime.
 - Use resources to support recommendations such as social stories, family friendly activities
- Address one challenge at a time, prioritize

Feeding is Fragile



- Carefully manage change – Create just the right challenge
- When expanding food preferences, use **caution** when altering preferred food choices as it may negatively impact child's nutrition
- Establish a pace for change that works for the child, family, school, classroom, and all team members



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**Question & Answer
Session**

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