

## Beyond Picky Eating: Feeding Challenges in Autism Spectrum Disorders

**Aida Miles, MMSc, RD, LD**

University of Minnesota  
School of Public Health  
and Clinic 4 Kidz  
[miles081@umn.edu](mailto:miles081@umn.edu)

September 2012

## Objectives

- **Objective 1:** Provide an overview of characteristics of autism that make children prone to feeding/eating challenges.
- **Objective 2:** Describe therapeutic interventions for children with feeding problems.
- **Objective 3:** Provide an overview of special diets used in autism spectrum disorders.

## Selected Characteristics & Feeding



## Selected Characteristics & Feeding

- Impaired communication & social interactions
- Restricted interests and activities & Insistence on sameness
- Sensory Hyper or Hyposensitivity
- Gastrointestinal Problems?



## Feeding Problems

- 25-35% in normally developing children
- As high as 90% in children with ASDs



## Food & Feeding Problems

- Infancy- late acceptance of solids, slow eating
- Preschool age – hard to feed, very choosy




### Food & Feeding Problems (cont)

- Food Selectivity
- Food Refusal
  - Eliminating food previously eaten
  - Strong dislike of some foods



### Food & Feeding Problems (cont)


- Specific Requirements:
  - Utensils
  - Foods presented in a certain way
- Gagging
- Pica



Kodak & Piazza. Child and Adol Psych Clinics of NA. 2008; 17, 887-905.  
 Elmond, et. al. Pediatrics 2010; 126:e337-e342.  
 Bandini, et. al. J Pediatr 2010; 157:259-64.  
 Kerwin, et. al. Children's Health Care 2005;34:221-234

### What are the repercussions?


- Inadequate nutrient intake (?)
- High intake of multivitamin/multimineral and single nutrient supplements
- Caregiver frustration / Mealtime chaos
- Limited flexibility (eating out, vacations, school, etc)
- Social Development



Lockner, et. al. J Am Diet Assoc. 2008; 108:1360-1363.  
 Emond, et. al. Pediatrics 2010; 126:e337-e342.

### Inadequate nutrient intake?

- Children with ASDs tend to have a narrow number of foods they will eat.
  - Macronutrient intake seems adequate.
  - Calorie intake seems adequate.
  - Micronutrient intake may or may not be adequate.
  - Fruits and vegetables seem to be lacking.
- Growth seems adequate.



Emond et al. Pediatrics 2010; 126:e337-e342

### Inadequate nutrient intake?


- Many case reports of micronutrient deficiencies with adverse consequences, some severe and irreversible:



### Treatment approaches to Feeding Problems



## Types of Treatment




- Medications
- Nutritional Regimens or Supplements
- Habilitative therapies (Occupational / Speech)
- Applied Behavior Analysis

Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.

## Medical Treatments


- Medications
  - Anti-reflux / Acid Reducers: Tagamet, Prilosec, Prevacid, Nexium, Maalox
  - Motility: Reglan, Erythromycin
  - Appetite stimulants: Periactin



Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.

## Dietary Interventions


- Dietary Restrictions
  - Milk and other potential allergens
  - Gluten
  - Casein
  - Specific Carbohydrates



Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.

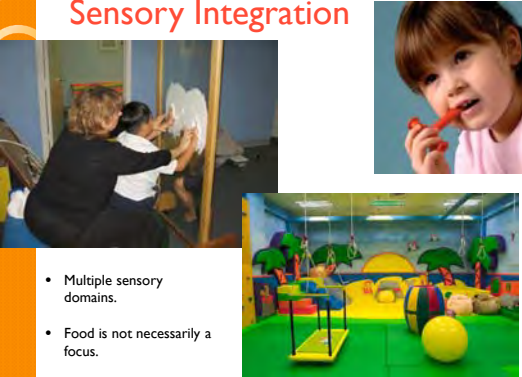
## Occupational and Speech Therapy

- Broad sensory integration therapy (OT)
- Sequential Oral Sensory Therapy
- Food chaining




Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.

## Sensory Integration



- Multiple sensory domains.
- Food is not necessarily a focus.

## Sequential Oral Sensory



- Small gradual changes
- Child sets the pace

Child lets carrots on plate

Child will touch carrots


Child will bring carrots to lips

Child will lick carrots

Adapted from Lucas, Pechstein & Ogata. Nutrition Focus. Volume 17, No. 1, Jan/Feb 2002.

## Food Chaining

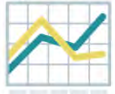
- Start with something the child accepts
- Small gradual changes



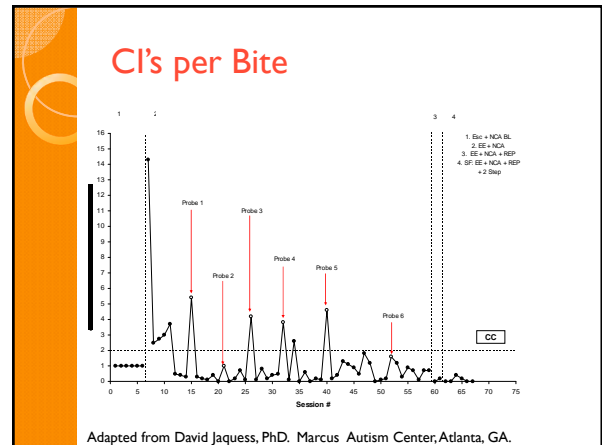
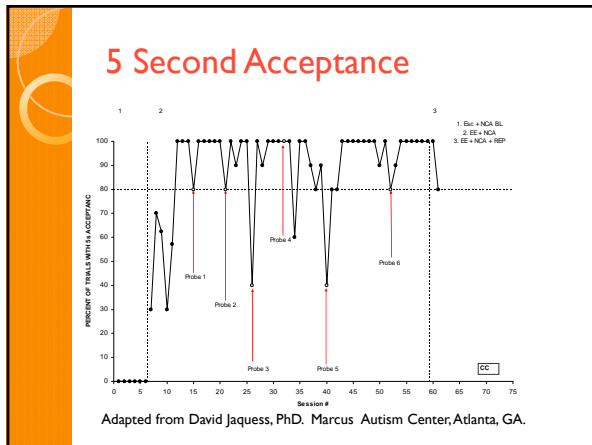
Eats french fries      Try apples cut in long, thin "sticks"      Try pears cut in long, thin "sticks"

## Behavioral Treatments

- Applied Behavior Analysis
  - More focus on data
  - Slow systematic changes
  - Demonstrating the need for the treatment
- Considerable overlap with other therapies & may help evaluate impact of a therapy



Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.



## Broad Temporal Categories of Learning

- A** • Antecedents
- B** • Behaviors
- C** • Consequents

Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.

## A – B – C Chart

Antecedent	Behavior	Consequence
Mom puts food on Riley's plate	Riley turns her head (food refusal)	Mom holds up the spoon and says "Take a bite honey" (attention)
Mom presents spoon	Riley turns her head (food refusal)	Mom leans forward, turns Riley's chin, looks her in the eye and says "Take a bite, honey" (attention)
Mom points to some food on the tray and says "Yummy!"	Riley turns her head (food refusal)	Mom leans forward, turns Riley's chin, looks her in the eye and says "Come on, you can do it!, it's easy" (attention)
Mom points to the food	Riley takes a bite of food (food acceptance)	Mom turns away from Riley to reload food on the spoon (removal of attention)

## Developing an Intervention Plan

1. Baseline Data Collection
  - What is tolerated (tasks, duration)
  - Break down task into many mini-steps
    - Intervention will start at a mini step that is easy for child and unlikely to produce severe negative behaviors.

## Developing an Intervention Plan

2. Address anything that could make the experience aversive
  - Seating and Positioning
  - Medications
  - Oral-motor skills

## Developing an Intervention Plan

3. Identify highly preferred reinforcers
  - Varied and rotated randomly
  - Used as a reward for desired behaviors (they will be weaned over time)
  - Help maintain child's interest

Antecedent	Behavior	Consequence
Riley seated at the table, mom puts food on her plate.	Riley turns head away	Mom does not say anything, remains neutral for 20 sec (uses timer)
Mom picks up spoon and says "Riley take a bite"	Riley turns her head away	Mom does not say anything, remains neutral. Waits for timer (20 sec)
Mom picks up spoon and says "Riley take a bite"	Riley takes a bite of food.	Mom claps and says "Good job Riley", and sings a tune Riley loves for 20 seconds until timer goes off
Mom picks up spoon and says "Riley take a bite"	Riley pushes spoon away.	Mom does not say anything, remains neutral. Waits for timer (20 sec)

## Consequences: Reinforcement

- To increase a behavior: reinforce it
  - Praise / attention
  - Brief toy play
  - Brief break (escape)
- Go in small steps for complex behavior
- End on a good note:
  - Consistent cut-off: average level of prior success
  - Resist temptation to push for "one more bite."

Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.

## Desensitization via Exposure

- Similar to treatment of fears & phobias
- Letting go of fear or aversion
  - Explaining & understanding are not necessary
- Experience the food without the pain or unpleasant sensations
  - Spontaneous recovery
  - Generalization to other settings & caregivers

Adapted from David Jaquess, PhD. Marcus Autism Center, Atlanta, GA.

## Diet and Nutrition



## Why special diets?

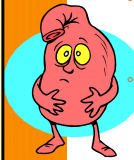
- Many children seem to have gastrointestinal (GI) issues
- Hypothesis that children with autism have a “leaky gut”
- Many children have food allergies and perhaps “sensitivities”
- Diet and behavior have been long debated
- Why not?



## Gastrointestinal Issues

Buie, et. al Evaluation, Diagnosis and Treatment of GI Disorders in Individuals with ASDs: A Consensus Report. Pediatrics 2010; 125:S1-S18.

- Evidence Based recommendations are not yet available.
  - People with ASD should receive the same thorough care as people without ASD.
- Behavior problems may be the primary symptom of an underlying medical condition.



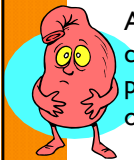
## Gastrointestinal Issues- Consensus Report

- GI problems common in people without ASD are also common in ASD.
  - Most common:
    - Chronic Constipation
    - Abdominal pain with or without diarrhea
    - Encopresis (consequence of constipation)
- Other symptoms :
  - GERD
  - Abdominal bloating
  - Disaccharidase deficiencies
  - GI tract inflammation



## Gastrointestinal Issues – Consensus Report

- There are potential nutritional problems in people with ASDs.
- Evaluation by a nutritionist who is familiar with nutrition support for people with ASDs is recommended if caregivers raise concern about the patient’s diet or if the patient exhibits selectivity of intake or is on a restricted diet.



## Gastrointestinal Issues – Consensus Report


- Nutrition Assessment should include:
  - Weight for height or BMI
  - Weight for age
  - Height for age
  - Marked changes in growth rate
- Any child with growth concerns should be referred to a nutritionist, preferably one who is familiar with nutrition support for people with ASDs.





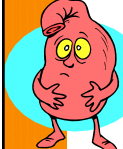
### Gastrointestinal Issues – Consensus Report

- Anecdotal reports suggest that there may be a subgroup of people with ASD who respond to dietary intervention.
- Additional data is needed before specific recommendations can be made by health professionals regarding diet.




### Gastrointestinal Issues - Consensus Report

- Available research does not support the use of a casein-free diet, gluten-free diet, or GFCF diet as a primary treatment for people with ASDs.



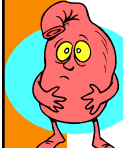
### Gastrointestinal Issues - Consensus Report

- GF, CF or GFCF Diets:
  - If pursued, parents need guidance to help plan balanced diets.
  - Need to agree on objective measures, ideally evaluated by blinded observers, to assess the intervention effect as well as a reasonable time frame before pursuing restrictive diets.




### Gastrointestinal Issues – Consensus Report

- Allergies/ Intolerances:
  - A detailed history should be obtained to identify potential associations between allergen exposure and GI and/or behavioral symptoms.



### Gastrointestinal Issues – Consensus Report

- Clinical trials of treatment of GI symptoms should include banking of DNA samples.



### Diets in ASDs



## What kinds of diets?

- The Specific Carbohydrate Diet
    - “harmful gut pathogens survive because they feed and thrive on carbohydrates that are difficult to digest”
- SCD- NOT allowed:
- grains (i.e. rice, wheat, corn, oats, etc.),
  - processed foods,
  - starchy vegetables (i.e. potatoes, yams, etc.),
  - canned vegetables
  - flour, sugar, sweeteners other than honey and saccharin,
  - Milk products except for homemade yogurt fermented for 24 hours.



Very difficult to follow- **ONLY** anecdotal evidence.

## Gluten Free Casein Free Diet

- What does the research say?
  - Small studies
  - Randomized, Controlled
  - Anecdotal reports and Case reports
  - Some children do show developmental improvements
  - **NEED** much larger studies and perhaps DNA banking

*Whiteley et. al. Nutritional Neuroscience. 2010; 13:87-100.*

*Elder, et. al. J Autism Dev Disord. 2006; 36(3): 413-420.*

*Elder. Nutr Clin Pract. 2008; 23:583-588.*

## Pros and Cons of a GFCF Diet

### PROS:

- Reported improvements in autistic behavior, nonverbal cognitive level and motor problems in some children.

### CONS:

- Expense
- Time
- Resources
- Nutrition adequacy/ deficiencies / consequences

*Elder. Nutr Clin Pract. 2008; 23:583-588.*

*Hediger. J Autism Dev Disord 2008; 38:848-856*

*Whiteley. Nutritional Neuroscience. 2010; 13: 87-100*

*Rossignol. Annals of Clin Psychiatry. 2009; 21: 213-236*



## What is the provider to do?

- Be empathetic
- Review with the family:
  - Child's nutritional status
  - Literature's gaps
  - Child's current diet variety and feeding behaviors
  - Resources / Time / Commitment / Compliance
  - Outside influences
  - Clinician support and guidance
- Track data in the most objective way possible!!!

## Questions?





## Bibliography:

- Arnold, G. L., Hyman, S. L., Mooney, R. A., & Kirby, R. S. (2003). Plasma Amino Acids Profiles in Children with Autism: Potential Risk of Nutritional Deficiencies. *Journal of Autism and Developmental Disorders*, 33, 449-454.
- Buie T, Campbell DB, Fuchs GJ, et al. (2010). Evaluation, Diagnosis, and Treatment of Gastrointestinal Disorders in Individuals with ASDs: A Consensus Report. *Pediatrics*, 125 (supplement 1):S1-S18.
- Buie T, Fuchs GJ, Furuta G.T. et al. (2010). Recommendations for Evaluation and Treatment of Common Gastrointestinal Problems in Children with ASDs. *Pediatrics*, 125 (Supplement 1):S19-S29.
- CDC, Autism Facts. *Autism Facts*. Retrieved March 5, 2011, from <http://www.cdc.gov/ncbddd/autism/facts.html>
- CDC, Autism Treatments. *Autism Treatments*. Retrieved March 5, 2011, from Center for Disease Control and Prevention: <http://www.cdc.gov/ncbddd/autism/treatment.html>
- Center for Disease Control and Prevention (CDC). (2009, December 18). Prevalence of Autism Spectrum Disorders—Autism and Developmental Disabilities Monitoring Network, United States, 2006. *Morbidity and Mortality Weekly Report. Surveillance Summaries*, 58 (SS10), pp. 1-20.

## Bibliography (cont):

- D'Auria, J. (2010). Autism on the Web: "Oh, the Places You'll Go!". *J Pediatr Health Care*, 24, e11-e15.
- Elder JH, Shanker M, Shuster J, Theriaque D, Burns S, Sherrill L. (2006) The gluten-free, casein-free diet in autism: Results of a preliminary double blind clinical trial. *J of Autism Dev. Disord*. 36(3):413-20.
- Elder JH. (2008). The Gluten-Free, Casein-Free Diet in Autism: An Overview with Clinical Implications. *Nutrition in Clinical Practice*, 23, 583-588.
- Harrington, J.W., Rosen, L., Garnecho, A., & Patrick, P.A. (2006). Parental Perceptions and Use of Complementary and Alternative Medicine Practices in Children with Autism Spectrum Disorders in Private Practice. *Developmental and Behavioral Pediatrics*, 22, S156-S161.
- Hediger, M. L., England, L. J., Molloy, C. A., Yu, K. F., Manning-Courtney, P., & Mills, J. L. (2008). Reduced Bone Cortical Thickness in Boys with Autism Spectrum Disorder. *J Autism Dev Disord*, 38, 848-856.
- Hesse, B.W., Nelson, D.E., Kreps, G. L., Croyle, R.T., Arora, N. K., Rimer, B. K., et al. (2005). Trust and Sources of health Information. *Arch Intern Med*, 165, 2618-2624.
- Jensen, V. K., & Spannagel, S. C. (2011). The Spectrum of Autism Spectrum Disorders: A Spectrum of Needs, Services and Challenges. *J Contemp Psychother*, 41, 1-9.

## Bibliography (cont):

- Keenan, K., Dillenburger, K., Doherty, K., Byrne, T., & Gallagher, S. (2010). The Experiences of Parents During Diagnosis and Forward Planning for Children with Autism Spectrum Disorder. *Journal of Applied Research in Intellectual Disabilities*, 23, 390-397.
- Knivsberg AM, Reichelt KL, Høien T, Nodland M. (2002) A randomised, controlled study of dietary intervention in autistic syndromes. *Nutritional Neuroscience*, 5(4):251-6.
- Knivsberg AM, Reichelt KL, Høien T, Nodland M. (2003) Effect of dietary intervention on autistic behavior. *Focus on Autism and Other Developmental Disabilities*, 18(4):247-56.
- Krauss, M.W., Gulley, S., Sciegaj, M., & Wells, N. (2003). Access to Specialty Medical Care for Children with Mental Retardation, Autism, and Other Special Health Care Needs. *Mental Retardation*, 41, 329-339.
- Levy S. (2003). Complementary and Alternative Medicine Among Children Recently Diagnosed with Autistic Spectrum Disorder. *Journal of Developmental and Behavioral Pediatrics*, 24, 418-423.
- Mercer L., Creighton, S., Holden J.J.A., Lewis, M. E.S. (2006). Parental Perspectives on the Causes of an Autism Spectrum Disorder in their Children. *J Genetic Counselling*, 15, 41-50.

## Bibliography (cont):

- Millward, C., Ferriter, M., Calver, S.J., Connell-Jones, G.G. (2008) Gluten- and casein-free diets for autistic spectrum disorders. *Cochrane Database of Systematic Reviews*. Issue 2. Art. No.: CD003498. DOI: 10.1002/14651858.CD003498.pub3.
- Sharp, G.V.V., Jaquess D.L., Morton, J. F., Herizinger, C.V. (2010) Pediatric Feeding Disorders: A Quantitative Synthesis of Treatment Outcomes. *Clin Child Fam Psychol Rev*. Published online 16 Sept. DOI 10.1007/s10567-010-0079-7
- Srinivasan P. (2009). A Review of Dietary Interventions in Autism. *Annals of Clinical Psychiatry*, 21, 237-247.
- Whiteley P, Haracopos D, Knivsbert AM, et Al. (2010) The ScanBrit randomised, controlled, single-blind study of a gluten- and casein-free dietary intervention for children with autism spectrum disorders. *Nutritional Neuroscience*. 13(2):87-100.
- Wong, H. L., & Smith, R. G. (2006). Patterns of Complementary and Alternative Medical Therapy Use in Children Diagnosed with Autism Spectrum Disorders. *J Autism Dev Disord*, 36, 901-909.