Nutrition and Feeding Interventions for Autism Spectrum Disorder & ADHD

Section 1
- Overview

Section 2
- Basic Nutrition

Section 3
- Common Problems

Section 4
- Biochemical Abnormalities
What is Autism?

Autism Spectrum Disorder
299.00 Autistic Disorder
299.80 Asperger’s Disorder
299.80 Pervasive Developmental Disorder
Not Otherwise Specified (PDD-NOS)

Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)
American Psychiatric Association
Autism Spectrum Disorder

ASD
- Puzzling childhood disorder
- 1 in 88 individuals
- Affects communication, social interaction, and behavior
- Spectrum disorder
Autism Spectrum Disorder

What causes ASD?

Theories:
- Genetic
- Biological or neurological differences in the brain
- Environmental factors

“There is no know single cause for autism. It seems that some children are born with a genetic susceptibility to autism. What makes some susceptible children develop autism and others not is an important research question.”
ASD – Brain – Nutrition
Nutrients Critical for Brain Function

- Protein
- Fat
- Carbohydrate
- Amino Acids
- Omega-3 Fatty Acids
- Vitamins
- Minerals
- Water
Nutrition Therapy

**Goals of Nutrition Therapy**

1. Support the function of the child’s brain and body to perform at their optimum level.
2. Treat underlying biochemical abnormalities.
3. Maximize the child’s brain function to enhance their response to other treatment approaches (SLP, OT, PT, Behavior, Special Education Instruction, etc...).
Nutrition Therapy

Steps in the Nutrition Care process:
1.) Assessment
2.) Diagnosis
3.) Intervention
4.) Monitoring and Re-evaluation

Academy of Nutrition and Dietetics
Components of a Nutrition Assessment:

- Anthropometrics
- Biochemical
- Clinical
- Dietary
- Environmental
- Feeding
Nutrition Therapy

- Nutrition assessment (ABCDEF)
- Recommend dietary changes
- Recommend nutritional supplements
- Treat nutritional deficiencies
- Heal the gastrointestinal tract
- Help treat feeding problems
- Treat food allergies/sensitivities/intolerances
- Refer to physician for diagnostic tests
- Refer to other therapists as needed
- Support parents in the decision process
- Incorporate nutrition services in IFSP and IEP
Nutrition Therapy

Laboratory Tests:
- Complete Blood Count (CBC)
- Comprehensive Metabolic Panel (CMP)
- Blood Lead and Mercury
- Thyroid (T3, T4, TSH)
- Vitamin D
- Serum carnitine
- IgE RAST (wheat, milk, soy, egg, peanuts)
- IgE RAST (cat, dog, dust mite, dust, mold, cockroach, grass, pollen, trees)
- Serum amino acids
- Celiac Panel
- Stool Culture (fecal fat, bacteria, parasites, reducing substances)
- Vitamin & minerals (based on meds, clinical history and other factors)
How to locate a Registered Dietitian (RD):

- Early Childhood Intervention Program (ECI)
- State Dietetic Association
- Academy of Nutrition and Dietetics
  - www.eatright.org (click on “find a nutrition professional”)
- Dietitians in Integrative & Functional Medicine
  - www.integrativeRD.org
- National Dietitian Directory
  - www.dietitiandirectory.com
- Elizabeth Strickland, MS, RD, LD
  - www.ASDpuzzle.com
Role of the SLP, OT, PT, Educators, Behavioral Specialist, etc…

- **Screen** child to identify a nutrition problem
- **Refer** to a RD for Nutrition Therapy
- **Inform** parents why nutrition is critical
- **Educate** parents on basic nutrition information
- **Collect data** during the child’s trial response of various advanced nutritional interventions
# BASE-LINE DATA
(Prior to Trial Response)

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>DESCRIBE IN DETAIL CHILD'S SYMPTOMS</th>
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</thead>
<tbody>
<tr>
<td>Communication</td>
<td>(verbal, speech, echolalia,</td>
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<tr>
<td></td>
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<tr>
<td>Social Interaction</td>
<td>(interaction with others,</td>
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<td>social play, friendships)</td>
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<tr>
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<td></td>
<td>preoccupation with objects</td>
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<td></td>
<td>and/or one interest)</td>
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<tr>
<td>Other</td>
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<td>Enuresis (bed wetting)</td>
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<td>Ears (ear infections)</td>
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<td>Eyes (dark circles, red, itchy, watery)</td>
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<tr>
<td>Respiratory (asthma, bronchitis, stuffy/runny nose)</td>
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<tr>
<td>Bowels (constipation, loose stools, diarrhea, gas, bloating)</td>
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<tr>
<td>Feeding (limited variety of foods, refuse new foods)</td>
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<tr>
<td>Other</td>
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</tr>
<tr>
<td>SYMPTOM</td>
<td>Substantial Improvement</td>
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Nutrition Interventions for Autism

**Basic Nutrition**
- Clean up the diet
- Healthy foods
- Vitamin mineral supplement
- Omega-3 fatty acids (DHA + EPA)

**Common Problems**
- Feeding problems
- Gastrointestinal
- Food reactions

**Biochemical Abnormalities**
- Increased oxidative stress
- Immune dysfunction
- Detoxification dysfunction
- Mitochondrial disorder
EATING FOR AUTISM
THE 10-STEP NUTRITION PLAN TO HELP TREAT
YOUR CHILD’S AUTISM, ASPERGER’S, OR ADHD

EATING for AUTISM

THE 10-STEP NUTRITION PLAN
TO HELP TREAT
YOUR CHILD’S AUTISM, ASPERGER’S, OR ADHD

Elizabeth Strickland, MD, RD, LD

Includes
75
Gluten-Free,
Casein-Free
Recipes

In *Eating for Autism*, leading dietitian Elizabeth Strickland explains the nutrition-autism connection and presents an easy 10-step plan to positively change your child’s diet.

You’ll learn how to:
- Help your child transition to healthy foods and expand his diet
- Select the right multi-vitamin and mineral supplements
- Identify and treat gut problems and food allergies
- Follow the most effective special diets and interventions
- Make your child’s favorite foods gluten-free and casein-free
The 10 – Step Nutrition Plan

1. Transition to a healthy diet
2. Consume adequate basic nutrients
3. Select a multi vitamin/mineral supplement
4. Select an omega-3 fatty acid supplement
5. Treat child’s feeding problem
6. Heal the gastrointestinal tract
7. Identify and treat food allergies
8. Consider special diets
9. Trial response of high dose B6
10. Consider additional supplements
Step 1: Transition to a Healthy Diet

1.) Eliminate synthetic food additives

2.) Limit foods that contain Trans Fat

3.) Avoid refined sugar
U.S. Food Facts

Standard American Diet “SAD” Diet

1950: The average size soda at FFR = 8 oz
Today: The average size soda at FFR = 12 oz
    Large soda = 32 oz
    Supersize soda = 42 oz

1972: We spent $3 Billion/year on fast food
Today: We spend $110 Billion/yr on fast food
Today:
- Soda is the most consumed food or beverage
- French Fries are the most eaten vegetable
- 40% of meals are eaten outside the home
- We consume 142 # sugar & 61 # HFCS
- We consume only 8 # of broccoli
Clean up the Diet

1.) Eliminate synthetic food additives
   - Artificial colors
   - Artificial flavors
   - Artificial Preservatives
   - Artificial sweeteners
Clean up the Diet

2.) **Limit foods that contain Trans Fat**
   - Vegetable shortenings
   - Foods fried in partially hydrogenated oils

Commonly found in some:
   - Margarines
   - Crackers
   - Cookies
   - Chips
   - Cakes
   - Pies
   - Bread
3. Avoid refined sugar
- White sugar, table sugar
- High-fructose corn syrup (HFCS)

Commonly found in:
- Soft drinks
- Energy drinks
- Fruit drinks
- Candy
- Ice cream
- Snacks
- Sweet foods
Step 2: Basic Nutrients

1. Purchase high-quality foods
   - Fresh, whole, organic
   - Hormone and antibiotic free
2. Prepare balanced meals
3. Daily routine for meals and snacks
4. Plan for breakfast
5. Filtered water
Children with ASD are at increased nutritional risk:

- Sensory problems
- Mealtime behavior problems
- Consume a limited variety of foods
- Elimination diets that limit certain foods
- Chronic gastrointestinal disorders
Subclinical Nutrition Deficiency

A deficiency of a particular vitamin or mineral that is not severe enough to produce a classic deficiency symptom but rather has more global, subtle effects that result in loss of optimal health and impairment of body processes.
Nutrient Deficiency Stages

1st Preliminary → Depletion of tissue stores
2nd Biochemical → Reduced enzyme activity
3rd Physiologic/Behavior → Subclinical deficiency symptoms
4th Clinical → Symptoms worsen
5th Anatomical → Specific syndromes

The Essential Guide to Vitamins and Minerals
Elizabeth Somer, MA, RD
Vitamin Mineral Supplement

**Subclinical nutrition deficiency symptoms:**
- Irritability
- Mood and behavior changes
- Poor concentration
- Depression
- Anxiety
- Sleep disturbances
- Loss of appetite
Selection of a V/M supplement:
- Buy from a reputable company

Examples:
- Kirkman®
- Pure Encapsulations
- Village Green Apothecary
Vitamin Mineral Supplement

Selection of a V/M supplement:

- Quality Control Procedures
  - US Pharmacopeia (USP)
  - Consumer Lab
  - NSF International
Selection of a V/M supplement:

- Read the label

Avoid:
- Artificial colors and flavors
- Potential allergens (wheat, milk, soy, egg & corn)
- Herbs
Selection of a V/M supplement:

- **Full spectrum vitamins & minerals**
  - Fat soluble vitamins (A, D, E, K)
  - Vitamin B complex (B1, B2, B3, B5, B6, B12, folic acid, biotin)
  - Vitamin C
  - Minerals (calcium, magnesium, zinc, selenium, manganese, chromium, molybdenum)

- **100 – 300% RDA**
Vitamin Mineral Supplement

Custom-made V/M Formula:
- Prescribed by a Registered Dietitian
- Individualized for the child’s needs
- Compounded by a pharmacist
- Form
  - Powder
  - Capsule
  - Liquid
Approaches to get child to take supplement:

1. Incorporate into child’s Behavior Therapy Program
2. Oralflo pill swallowing cup
3. Pill Swallow Program
4. Negotiation
5. Mix supplement into food or beverage

Eating for Autism, Chapter 3
Elizabeth Strickland, MS, RD, LD
Vitamin Mineral Supplement

**Mix in:**
- Beverages
- Juice box
- Fruit smoothie
- Fruit sorbet
- Rice dream
- Yogurt, pudding, custard
- Peanut butter
- Fruit preserves
- Honey
- Ketchup
- Cooked foods (after cooking)
- Popsicles (homemade)
- Coromega®
Should you recommend a V/M supplement?

YES

“Because most U.S. children do not receive adequate nutrition through their diet and children with ASD have additional nutritional concerns, adding a daily multi vitamin and mineral supplement to the child’s treatment plan is warranted.”

Elizabeth Strickland, MS, RD, LD
Step 4: Omega-3 Fatty Acids

Deficiency of Omega-3 fatty acids contribute to:

- Coronary heart disease
- Hypertension, diabetes, and cancer
- Pulmonary health problems
- Asthma
- Inflammatory & Autoimmune disorders
- Depression

Omega-3 Fatty Acids From Fish and Fish Oil Summary of Research
International Health News
Omega-3 Fatty Acids

Deficiency of Omega-3 fatty acids are linked to:

- Autism
- ADHD
- Dyslexia
- Dyspraxia
- Depression
- Anxiety
Omega-3 Fatty Acids

- Numerous studies indicate that Omega-3 fatty acids are deficient in ADHD, dyslexia, and dyspraxia.
- These neurodevelopmental conditions have a degree of overlap with autism.
- Abnormalities in fatty acid metabolism may account for many features common in these conditions.

*Fatty Acid Metabolism in Neurodevelopmental Disorder: A New Perspective on Associations Between Attention-Deficit/Hyperactivity Disorder, Dyslexia, Dyspraxia and the Autistic Spectrum*

*Prostaglandins Leukot Essent Fatty Acids 2000;63:1-9*

Richardson AJ, et al
Omega-3 Fatty Acids

“Supplementing children’s diets with Omega-3 fatty acids improves poor learning and behavioral problems.”

Journal of the Developmental and Behavioral Pediatrics
April 2007

“Supplementing with Omega-3 fatty acids decreased hyperactivity in children with autism spectrum disorders.”

Biological Psychiatry
2007
Many research studies indicate that supplementing with Omega-3 fatty acids reduces:

- Hyperactivity
- Inattention
- Impulsivity
- Anxiety
- Cognitive problems
Omega-3 Fatty Acids

Functions of Omega-3 Fatty Acids:

- Brain development of the fetus, infant and young child
- Maintenance of normal brain function throughout life
- Vital for brain cell signaling
- Anti-inflammatory
- Prominent structural fatty acid in the gray matter of the brain & retinol tissue
Omega-3 Fatty Acids

Omega 6

↓
Linoleic Acid

↓
Gamma-Linoleic Acid (GLA)

↓
Arachidonic Acid (ARA)

↓
Prostaglandin (PG1 & 2)

Ω-3

↓
Alpha Linolenic Acid (ALA)

↓
delta-6 desaturase

↓
Eicosapentaenoic Acid (EPA)

↓
Docosahexaenoic (DHA)

↓
Prostaglandin (PG1)
## Omega-3 Fatty Acids

### Adequate intake of Omega-3 Fatty Acids:

<table>
<thead>
<tr>
<th>Age</th>
<th>EPA + DHA (combined)</th>
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<tbody>
<tr>
<td>1 – 3 years old</td>
<td>390 mg/day</td>
</tr>
<tr>
<td>4 – 6 years old</td>
<td>540 mg/day</td>
</tr>
<tr>
<td>7 years &amp; older</td>
<td>650 mg/day</td>
</tr>
</tbody>
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*National Institutes of Health (NIH)*
# Omega-3 Fatty Acids

<table>
<thead>
<tr>
<th>Source</th>
<th>EPA + DHA (mg per ounce)</th>
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</thead>
<tbody>
<tr>
<td>Salmon, Atlantic, farmed</td>
<td>608</td>
</tr>
<tr>
<td>Herring, Pacific</td>
<td>602</td>
</tr>
<tr>
<td>Herring, Atlantic</td>
<td>571</td>
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<tr>
<td>Salmon, Atlantic, wild</td>
<td>521</td>
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<tr>
<td>Tuna, fresh (blue fin)</td>
<td>426</td>
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<tr>
<td>Mackerel, Atlantic</td>
<td>341</td>
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<tr>
<td>Trout, mixed species</td>
<td>265</td>
</tr>
<tr>
<td>Flounder</td>
<td>142</td>
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<tr>
<td>Halibut</td>
<td>132</td>
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<tr>
<td>Cod, Pacific</td>
<td>78</td>
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<td>Tuna, white (canned in oil)</td>
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<td>Haddock</td>
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<tr>
<td>Catfish, wild</td>
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<td>Catfish, farmed</td>
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<td>Cod, Atlantic</td>
<td>45</td>
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<tr>
<td>Tuna, light (canned in oil)</td>
<td>36</td>
</tr>
</tbody>
</table>

*USDA Nutrient Data Laboratory*
FDA & EPA recommendations for women who are or may become pregnant and nursing mothers:

- Do **NOT** eat shark, swordfish, king mackerel, and tilefish.
- Limit canned albacore “white” tuna to 6 ounces per week.
- Limit tuna steak to 6 ounces per week.
- Limit other fish and shellfish to 12 ounces per week.
- Check local advisories on safety of fish caught in your local waters.

*If no advisory, limit to 6 ounces and do not eat any other fish that week.*
Omega-3 Fatty Acids

No recommendations for amount of fish safe for children. FDA & EPA suggest to follow above recommendations, but serve smaller portions sizes.
## Omega-3 Fatty Acids

### Source

**Supplements**
- Cod liver oil (liquid) 1,035 mg / teaspoon
- Coromega™ (original) 580 mg / packet
- *Arctic cod liver oil 207 mg / soft gel
- *DHA Junior 52 mg / soft gel
- *Nordic Omega-3 Gummies 68 mg / gummy
  - *(Brand - Nordic Naturals)*

**Fortified Foods**
- Eggs, Milk, Soy Milk, Juice, Yogurt, Margarine, Bread, Pasta, Peanut Butter
  - Varies

### EPA + DHA

- 1,035 mg / teaspoon
- 580 mg / packet
- 207 mg / soft gel
- 52 mg / soft gel
- 68 mg / gummy
Should you recommend Omega-3 fatty acids? YES

“Because most U.S. children do not consume an adequate amount of Omega-3 fatty acids in their diet and Omega-3 fatty acids are essential for brain function and vision processing adding a daily Omega-3 fatty acid supplement to the child’s treatment plan is warranted.”

Elizabeth Strickland, MS, RD, LD
Cleaning up the diet, providing healthy foods, and appropriate supplements will improve the child’s:

- Brain function
- Learning
- Memory
- Attention
- Focus
- Concentration
- Mood
- Behavior
- Sleep
- Socialization
- Energy
- Growth
- Overall health
- Potential
Nutrition Interventions for Autism

**Basic Nutrition**
- Clean up the diet
- Healthy foods
- Vitamin mineral supplement
- Omega-3 fatty acids (DHA + EPA)

**Common Problems**
- Feeding problems
- Gastrointestinal
- Food reactions

**Biochemical Abnormalities**
- Increased oxidative stress
- Immune dysfunction
- Detoxification dysfunction
- Mitochondrial disorder
Step 5: Treat Child’s Feeding Problem

“The prevalence of problem eating behaviors in children with autism has been estimated to range between 46% and 89%.”

Research studies indicate that children with autism are more likely to exhibit feeding problems than children with other developmental disabilities or typically developing children.
Common Mealtime Behaviors:

1. Selective food refusal
2. Food neophobia (fear of trying unfamiliar foods)
3. Nonfunctional mealtime rituals
4. Tantrums
Feeding Problems

Mealtime myths:
“He’ll eat when he gets hungry enough. Kids won’t starve themselves.”

“Don’t worry, he’ll outgrow his picky eating stage.”

This is NOT true for most autistic children who have feeding problems as opposed to a typical developing child who is a picky eater.
### Feeding Problems

<table>
<thead>
<tr>
<th>Picky Eater</th>
<th>Problem Feeder</th>
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</thead>
<tbody>
<tr>
<td>- Decreased variety of food (&lt; 30 foods).</td>
<td>- Restricted range of foods (&lt; 20 foods).</td>
</tr>
<tr>
<td>- Foods lost due to burn-out regained after 2 wks.</td>
<td>- Foods lost due to burn-out, foods not regained.</td>
</tr>
<tr>
<td>- Able to tolerate new foods on plate, touch, or taste.</td>
<td>- “Falls apart” when presented new foods.</td>
</tr>
<tr>
<td>- Eats at least 1 food from most food textures.</td>
<td>- Refuses entire categories of textures.</td>
</tr>
</tbody>
</table>

Kay Toomey, Ph.D.
Feeding Problems

Contributing Factors:
1. Medical
2. Psychological
3. Nutritional
4. Oral-Motor Dysfunction
5. Sensory Processing Disorder
6. Environmental
7. Child
8. Parent
9. Therapist
10. Behavioral
Feeding Problems

**Medical**

- Gastrointestinal Disorders
  - Gastroesophageal Reflux Disease (GERD)
  - Eosinophilic Gastrointestinal Disorders (EGID)
- Food allergy, sensitivity, or intolerance
- Medication side effects
- Dental problems
- Previous invasive interventions
Feeding Problems

Psychological

- History of medical problems
  i.e. Reflux resolved; however, child connects eating to a painful experience.
Feeding Problems

Nutritional

- Nutrient deficiencies
  - Loss of appetite

- Excess intake of juice, milk and other beverages
  - Displaces food intake
Feeding Problems

Oral-Motor Dysfunction

- Delayed self-feeding skills
- Difficulty sucking, biting, chewing, swallowing, or coordination of tongue movements
Feeding Problems

**Sensory Integration Dysfunction**
- Hypersensitive to smells, touch, and taste
- Hypersensitive to sound
- Sensory hyposensitive
- Visually overwhelmed
Feeding Problems

**Environmental**
- Mealtime distractions
- Grazing all day
- Lack of routine
- Improper physical environment
Child
- Hyperactive
- Short attention span
- Highly distractible
- Low frustration tolerance
- Need for routine and sameness
- Impaired social interactions
Feeding Problems

Parents

- Mealtime dynamics between child and parent
- No positive reinforcement
- Inappropriate social modeling
- Inconsistent parenting
- Coerces, tricks, or distracts child
Feeding Problems

**Therapist**

- Using food as a reward
- Treating child as a “picky eater”
- Inappropriate techniques utilized in feeding therapy sessions
- Not working in conjunction with a multi-disciplinary feeding team
Feeding Problems

Behavioral Problems
- Refuse to come to table
- Does not sit still in chair or leaves table
- Refuses to eat
- Throwing food
- Tantrums
- Gagging and/or vomiting
- Spitting out food
- Disrupting others who are eating
Feeding Problems

Basic Mealtime Strategies

- Do NOT allow child to “graze”
- 3 meals + 3 snacks per day
- Limit juice, milk, beverages to appropriate amounts
- Avoid distractions during mealtime
- Practice “social modeling”
- Offer manageable foods
- Positive reinforcement
- Use appropriate mealtime language
Feeding Problems

Basic Mealtime Strategies

- Prevent food repetition and burn-out
- Change one property of the same food each time offered
- Do NOT bribe, beg, or force child to “take a bite”
- Limit mealtime to less than 30 minutes
- Keep meal & snack times a pleasant atmosphere
- Expose child to a non-preferred food on a daily basis
Feeding Problems

Feeding Therapy

Feeding Team
- Physician
- Registered Dietitian
- Behavioral Specialist
- Occupational Therapist
- Speech Language Pathologist

1. Build a multi-disciplinary Feeding Team
2. Individual team members complete an assessment
3. List of the contributing factors
4. Develop a Feeding Intervention Plan
5. Implement the feeding therapy sessions
Feeding Therapy

What feeding methods are NOT helpful?

1. Mere exposure to food
2. Food Deprivation

Research supports that mere exposure to food will increase food preference among typically developing children; however, no studies support this technique is effective for treating children with feeding problems.
What feeding methods are helpful?

A combination of feeding methods varying for each child based on their individual feeding problems.
Feeding Therapy

Building on preferred foods:

- Food Chaining

Cheri Fraker, CCC-SLP

Expands the child’s food repertoire by introducing new foods that have the same features as the foods the child currently eats.
Feeding Therapy

Behavioral:

- Positive reinforcement
  Tangible item and/or praise
- Escape extinction
  Nonremoval of spoon and/or physical guidance
- Stimulus fading
  Increasing the number of bites and/or amount of food presented on spoon
Sensory:

- Sequential Oral Sensory Approach to Eating (SOS)

*Dr. Day Toomey, PhD*

32-step plan to ease the child into tolerating, interacting, smelling, touching, tasting, and eating a new food.
SOS Approach

Steps to eating:
1. Tolerate
2. Interact
3. Smell
4. Touch
5. Taste
6. Eating

SOS Approach to Eating
Kay Toomey, Ph.D.
Pediatric Psychologist
Feeding Problems

- Eating is one of the most important and complex skills acquired in early childhood.
- Children with ASD typically have problems with feeding.
- Feeding problems may lead to malnutrition negatively impacting brain and body function.
- A multi-disciplinary approach to assessing and treating the feeding problem is critical.
- The feeding treatment methods should be individualized for each child.
Step 6: Heal the Child’s Gut

- Studies suggest that the majority of children with autism may have a gastrointestinal disorder.
- Most of these children continue to suffer with undiagnosed GI disorders unable to verbally express the pain they feel.
- Identifying and correcting the child’s GI disorder can lead to significant overall improvement in digestion, health, behavior, and brain function.
“70% of autistic children were found to have a lifetime history of gastrointestinal symptoms such as abnormal stools, constipation, frequent vomiting, and abdominal pain.”

Journal of the Developmental and Behavioral Pediatrics
April 2006
Niehus, et al
GI activity of children with autism differs from other children:
1. Intestinal cells show abnormalities in how they break down & transport carbohydrates
2. Their intestines have abnormal amounts of certain bacteria.

Impaired Carbohydrate Digestion and Transport and Mucosal Dysbiosis in the Intestines of Children with Autism & Gastrointestinal Disturbances
PLoS-One
Williams BL, Hornig M, Buie T, Bauman ML, Cho Paik M, et al.
Sept 2011:Volume 6;Issue 9
“Problem behavior in patients with ASDs may be the primary or sole symptom of the underlying medical condition, including some gastrointestinal disorders.”

“Communication impairments of ASDs may lead to unusual presentations of GI disorders, including sleep disturbances and problem behaviors.”

“Individuals whose families report GI symptoms warrant a thorough gastrointestinal evaluation.”

“Evaluation, Diagnosis, and Treatment of Gastrointestinal Disorders in Individuals with ASDs: A Consensus Report”
Journal of the American Academy of Pediatrics
Pediatrics 2010;125:S1-S18
Gastrointestinal Disorders

Medical Treatment

Rule-out and treat possible Gastrointestinal Disorders:

- Gastroesophageal Reflux Disease (GERD)
- Eosinophilic Gastrointestinal Disorders (EGID)
- Irritable Bowel Syndrome (IBS)
- Inflammatory Bowel Disease (IBD)
- Intestinal inflammation
- Gastritis
- Celiac Disease
- Abnormal intestinal anatomy
- Lactose Intolerance
- Sucrose malabsorption
- Fructose malabsorption
- Fat malabsorption
- Maldigestion
- Enteric infection
- Parasites

“Evaluation, Diagnosis, and Treatment of Gastrointestinal Disorders in Individuals with ASDs: A Consensus Report”
Journal of the American Academy of Pediatrics
Pediatrics 2010;125:S1-S18
Gastrointestinal Disorders

Diagnostic Evaluation of GI Symptoms with ASD:
- Diagnostic trial of proton-pump inhibitor
- Diagnostic trial of lactose restriction
- pH probe
- Abdominal radiograph
- Lactose breath test
- Measure lactase-specific activity
- Stool analysis
- Esophagastroduodenoscopy (EGD)
- Colonoscopy
- Diet enhancements: fruits, fiber, and adequate fluid
- Routines for sleep and toilet time

"Evaluation, Diagnosis, and Treatment of Gastrointestinal Disorders in Individuals with ASDs: A Consensus Report"
Journal of the American Academy of Pediatrics
Pediatrics 2010;125:S1-S18
Gastrointestinal Disorders

**Gastrointestinal Symptoms**
- Reflux
- Vomiting
- Abdominal pain
- Bloating
- Flatulence
- Loose stool
- Diarrhea
- Constipation
- Infrequent stool
- Straining to pass stool
Gastrointestinal Disorders

Vocal Behaviors
- Clearing of throat
- Screaming
- Sobbing
- Whining
- Moaning
- Delayed echolalia
- Direct verbalizations

Motor Behaviors
- Facial grimacing
- Gritting teeth
- Grazing
- Mouthing on clothes
- Unusual posturing
- Pacing
- Jumping up and down
- Self-jury
- Aggression
- Puts pressure on abdomen
Gastrointestinal Disorders

**Changes in Overall State**
- Sleep disturbances
- Increased irritability
- Oppositional behavior

**Mealtime Behaviors**
- Food refusal
- Limited variety of foods
- Mealtime tantrums
- Discontinue eating foods used to eat
“Child may be trying to tell us something he can not put into words.”

Timothy Buie, MD
Gastrointestinal Disorders

**Contributing Factors:**
- Nutrient deficiencies, poor nutrition
- Inadequate water & fiber intake
- Low or increased muscle tone
- Decreased physical activity
- Irregular toilet habits
- Unable to communicate need to have a BM
- Holding their stool
- Medication side effects
- Long-term use of laxatives, suppositories & enemas
- Cow’s milk allergy or intolerance
Gastrointestinal Disorders

**Dietary Treatment**

1. Modify the diet
2. Eliminate problematic foods
3. Supplements
   - Probiotics
   - Antifungals
   - Digestive enzymes
   - Omega-3 fatty acids
   - Glutamine
Step 7: Identify and Treat Food Allergies

- Children with food allergies are at higher risk for nutrient deficiencies and decreased growth.
- Children with autism are more negatively affected by the symptoms of food allergies, sensitivities, and intolerances due to their problems with sensory integration dysfunction.

“A comprehensive nutrition assessment, consultation, and follow-up by a Registered Dietitian is recommended to treat food allergies.”

Elizabeth Strickland, MS, RD, LD
**Allergy:**
Define: An adverse **immunologic** response to food protein.

*Symposium: Pediatric Food Allergy*
*Pediatrics Vol. 111 No. 6 June 2003*
Food Allergy

**IgE Mediated Food Allergy**
- Immunoglobulin E (IgE) antibody mediated immune response
- Involves acute reactions
- Affects the skin, respiratory system, and/or gastrointestinal tract

**Non-IgE Mediated Food Allergy**
- Cell-mediated immune response
- Involves sub acute and chronic reactions
- Affects primarily the gastrointestinal tract (chronic diarrhea, loose stools, constipation, nausea, vomiting, reflux, bloating, abdominal pain & inflammation of the esophagus, stomach, small and large intestines)
Foods responsible for 90% of allergic reactions:

- Milk*
- Wheat*
- Soy*
- Egg*
- Peanuts*
- Tree nuts*
- Fish
- Shellfish

* More commonly seen in children.
Food Allergy

IgE Mediated Food Allergy
- RAST
- CAP RAST
- CAP System FEIA
- Skin Prick
- Elimination/Challenge Diet

Non-IgE Mediated Food Allergy
- Endoscopy and biopsy
- Elimination/Challenge Diet
  (If suspect EE, EG, and/or EC; Elimination/Challenge Diet is conducted for 8 – 12 weeks)
Sensitivity:
Define: A general term applied to a clinically abnormal response to a food or food additive.

- Does not involve the immune system
- Reactions imitate those of an allergy, usually mild
- Food additives commonly reported to cause reactions in sensitive individuals include sulfites, aspartame, MSG, preservatives (BHT and BHA), and tartrazine (yellow dye No. 5)
Intolerance

**Intolerance:**

**Define:** Caused by a defect in metabolism, usually a deficient enzyme.
- Does not involve the immune system
- Reactions imitate those of an allergy

**Example:** Deficiency of lactase enzyme results in a milk intolerance.

**Test:** Oral tolerance Test or Hydrogen Breath Test
## Food Reactions

<table>
<thead>
<tr>
<th>5% of Food Reactions:</th>
<th>95% of Food Reactions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgE mediated food allergy</td>
<td>Non-IgE mediated food allergy</td>
</tr>
<tr>
<td></td>
<td>Sensitivity</td>
</tr>
<tr>
<td></td>
<td>Intolerance</td>
</tr>
</tbody>
</table>
Food Reactions

Symptoms:
Ears – ear infections
Nose – congestion, sneezing, runny nose
Eyes – tearing, puffy, dark circles under eyes
Oral – swelling of lips, tongue, mouth, and throat
Skin – hives, eczema, red checks, itching
Respiratory – cough, wheezing, asthma
Intestinal – reflux, diarrhea, constipation, nausea, vomiting, abdominal pain
Neurological – headache, migraine, behavioral problems
Referral to a board-certified allergist:

- History, symptom diary, physical exam
- Diagnostic tests
  - Allergy vs. sensitivity vs. intolerance
  - IgE vs. Non-IgE mediated food allergy
- Physician-supervised oral food challenge to confirm positive test results
- Elimination/Challenge Diet
Food Reactions

Referral to a Registered Dietitian:
- Heal the gastrointestinal tract
- Elimination of problematic foods
- Resolve nutrient deficiencies
- Assess the child’s growth
- Assist parents with the Elimination/Challenge Diet
“The brain can absorb only what the seat of the pants can endure.”
Step 8: Consider Special Diets

Elimination Diets common in the autism community:
- Gluten Free Casein Free Diet (GFCF)

Others:
- Specific Carbohydrate Diet (SCD)
- Gut & Psychology Syndrome Diet (GAPS)
- Rotation
- Antifungal
- Feingold
- Low Oxalate
Gluten Free Casein Free Diet

• The GFCF Diet is the single most common Elimination/Challenge diet recommended for children with autism.

• There is very little evidence-based scientific research that supports or refutes claims of the GFCF Diet.
Gluten Free Casein Free Diet

Ongoing Research

“Diet and behavior in young children with autism.”

Sponsor: National Institute of Mental Health
Clinical Trials Identifier: NCT00090428

Website: www.clinicaltrials.gov
Gluten is the protein found in:
- Wheat
- Barley
- Rye

Common food products to avoid:
- Bran
- Couscous
- Cream of wheat
- Farina
- Kamut
- Malt
- Matzo/matzoh meal
- Oats and oatmeal
- Pasta
- Seitan
- Semolina
- Splet
- Tabbouleh
- Tritical
- Udon
- Wheat germ, flour, and starch
Gluten Free Casein Free Diet

Food additives may contain gluten:
- Emulsifiers
- Fillers
- Flavoring
- Hydrolyzed vegetable protein
- Texturized vegetable protein
- Modified food starch
- Seasonings
- Stabilizers
- Vegetable protein

Nonfood sources of gluten:
- Over the counter medications
- Vitamin mineral supplements
- Lipstick, lip gloss, & lip balms
- Play-Doh
- Glue
Gluten Free Casein Free Diet

Casein is the protein found in:
- Cow’s milk
- Cow’s milk products

Common foods to avoid:
- Cow’s milk
- Butter
- Caseinates
- Cheese and cottage cheese
- Cream
- Curds
- Custard and pudding
- Ghee
- Goat’s milk
- Half & Half
- Ice Cream, Ice Milk, & Sherbet
- Lactoglobulin, Lactalbumin, Lactoferrin
- Milk chocolate
- Nougat
- Rennet
- Sour cream
- Whey
- Yogurt
Gluten Free Casein Free Diet

**Food products and additives that may contain casein:**

- Brown sugar flavoring
- Canned tuna
- Caramel flavoring
- Chocolate
- Commercially prepared mixes
- Lactic acid starter culture
- Margarine
- Packaged dinners
- Processed meats (hot dogs, luncheon, and sausage)
- Natural flavoring
- Nondairy creamer
- Salad dressings
- Sauces and soups
- Simplesse
- Vegetarian nondairy cheese substitutes
- Whipped topping
Gluten Free Casein Free Diet

Positive results reported by parents:
- Improves gastrointestinal symptoms
- Decreases hyperactivity
- Increases focus
- Reduces behavioral problems
- Improves speech & communication skills
- Improves sleep
Gluten Free Casein Free Diet

Should you recommend a GFCF Diet?

“Current research, clinical observation, and anecdotal reporting warrants a case-by-case consideration for a GFCF Diet trial response.”

Elizabeth Strickland, MS, RD, LD
Specific Carbohydrate Diet

- SCD was initially designed to treat Inflammatory Bowel Disease.
- Goal of the SCD is to restore health to the digestive system, correct dysbiosis, decrease intestinal inflammation, and heal the intestinal tract.

Created by: Dr. Sidney Valentine Haas
Specific Carbohydrate Diet

- Parents of children with Autism “discovered” the SCD, tried the diet and many reported positive results.
- More recently, SCD has been proposed as a dietary treatment for autism due to the number of children with gastrointestinal disorders.
Carbohydrates are classified by their molecular structure.

Allowed carbohydrates have a molecular structure that is small enough to be transported across the surface of the small intestines into the blood stream.

Carbohydrates to avoid include disaccharides (lactose, sucrose, maltose) & polysaccharides.

The SCD starts with a limited number of foods and gradually adds more foods as the intestinal tract heals.
Gut and Psychology Syndrome Diet

- GAPS Diet is founded on the SCD
- Also eliminates: Lactose-free dairy products
- Supplements
- Detoxification & life-style changes

Created by: Dr. Natasha Campbell-McBride
Rotation Diet

Based on the belief that rotating foods every four days will minimize reactions and reduce the likelihood of developing an allergy to these foods.

Lab Test:
- **IgG ELISA**: Used to identify foods that are believed to cause a delayed food reaction.
- **Mediator Release Test (MRT)**: Believed to identify non-IgE mediated food reactions.
Antifungal Diet

- Based on the *theory* that autistic children have an overgrowth of yeast in their GI tract.
- The diet eliminates foods that contain yeast and foods that *supposedly* stimulate the growth of yeast.
  - Sugar
  - Fruits and fruit juice
  - Fermented foods
  - Baker’s yeast
  - Aged foods
Feingold Diet

Based on the *theory* that foods containing salicylates and food additives trigger adverse physical and behavioral symptoms in sensitive children.

The diet eliminates:

- artificial colors
- artificial flavors
- preservatives (BHA, BHT, TBHA)
- aspartame
- foods containing salicylates (some fruits, vegetables, cheese, herbs, spices, condiments, beverages, nuts & candies)
Based on the belief that reducing dietary oxalates will improve autism and other developmental disorders.

Oxalate is a substance that links with calcium to form crystals.

Research indicates that oxalate alters cell membranes by lipid peroxidation, oxidizes, and interferes with glutathione.

Normally the gut can’t absorb oxalates from the diet; “leaky gut” can result in absorption of oxalates.

Increased levels of oxalate in blood can get into the brain.
## Low Oxalate Diet

**Foods high in oxalate:**
- Almonds
- Buckwheat flour
- Beets
- Miso
- Tahini
- Rhubarb
- Sesame seeds
- Spinach
- Swiss chard
- Chocolate soy milk

**Foods moderate in oxalate:**
- Nuts & seeds
- Peanut butter
- Okra, tomato, potato
- Greens - collard & mustard
- Beans
- Barley, wheat
- Rice flour
- Cornmeal
- Soy milk
- Figs, kiwi, dried apricots
- Chocolate candies
There are numerous and an increasing number of special diets “popular” in the autism community.

Most diets to help treat autism are considered controversial and not supported by the medical community.

It is critical that the child’s diet is **NOT** overly and unnecessarily restricted.

Before a trial response of any elimination diet it is important for the family to consult with a knowledgeable RD to ensure the diet is implemented properly and the child’s nutritional health is not compromised.
# Nutrition Interventions for Autism

## Basic Nutrition
- Clean up the diet
- Healthy foods
- Vitamin mineral supplement
- Omega-3 fatty acids (DHA + EPA)

## Common Problems
- Feeding problems
- Gastrointestinal

## Biochemical Abnormalities
- Increased oxidative stress
- Immune dysfunction
- Detoxification dysfunction
- Mitochondrial disorder
Vitamins B6, B12 and Folate may be used to help treat the potential underlying biomedical abnormalities:

- Increased oxidative stress
- Immune dysfunction
- Detoxification dysfunction
B6, B12 & Folate

- Lipid peroxidation markers are elevated
- Major antioxidant levels are decreased
- Glutathione levels are altered

Oxidative stress in autism
Chauhan A and Chauhan V

Metabolic endophenotype & related genotypes are associated with oxidative stress in children with autism.
James S, et al.
Folinic acid and B12 supplementation improved ratio of oxidized to reduced glutathione in children with ASD

Efficacy of methylcobalamin and folinic acid treat on glutathione redox status in children with autism.

James S, et al.
B6, B12 and folate are cofactors required in the process of methylation.

- High dose B6
- Methylcobalamin
- Folinic acid
“There are numerous vitamins, minerals, antioxidants, amino acids, nutraceuticals, and herbs believed to benefit children with ASD. These supplements are commonly used as advanced nutritional interventions in the autism community to treat potential biochemical abnormalities; however, some professionals in the medical community may not support their use.”

Elizabeth Strickland, MS, RD, LD
This situation is **NOT** appropriate!!!
Carnitine

- Reduced levels of free and total carnitine in individuals with ASD.
- Supplementation with levocarnitine improved several clinical measurements of autism.

Relative carnitine deficiency in Autism.
Filipek P, et al.
J Autism Dev Disord. 2004;34:615-23

A prospective double-blind, randomized clinical trial of levocarnitine to treat autism spectrum disorders.
Geier D, et al.
Detoxification

- It is a common belief in the autism community that children with ASD have a dysfunctional detoxification system.
- It is believed that children with ASD can not effectively excrete toxins out of their body.
- Toxins cross into the brain, cling to brain tissue, and damage the brain.
- Children with ASD may be more vulnerable to neurological damage caused by exposure to toxins.
Detoxification

Neurotoxic chemicals are particularly toxic to the sensitive, rapidly developing systems of the fetus, infants, and young children.

- Lower I.Q.
- Learning disabilities
- Attention deficit
- Hyperactivity
- Impulsiveness
- Aggressive behavior
- Speech delay
- Mental retardation

In Harm’s Way: Toxic Threats to Child Development
Greater Boston Physicians for Social Responsibility
September 2002
Chemicals in the environment capable of causing neurodevelopmental disabilities:

- **Metals** (lead, mercury, cadmium, arsenic, manganese)
- **Pesticides** (organophosphates, pyrethroids, organochlorines)
- **Solvents** (toluene, xylene, styrene, trichloroethylene, alcohol)
- **Other** (dioxin, PCB, nicotine, fluoride)
Detoxification

**Phase 1**
- Toxin enters the body.
- Activates cytochrome P-450 oxidase enzymes.
- Increases the solubility of the toxin.
- Results in the production of free radicals.

**Phase 2**
- Individual toxins follow a particular pathway (e.g. sulfation).
- Chemical reactions add a hydrophilic molecule to the toxin converting it to a water-soluble form for excretion & elimination.
  * Phenolsulfotransferases (PST) primary enzymes in this process.
Enhance the detoxification system:

- Glutathione
- Vitamin C
- Selenium
- Alpha-Lipoic Acid
- N-acetylcysteine (NAC)
- Trimethylglycine (TMG)
- Milk thistle
Nutritional Detoxification Plan:
1. Identify & eliminate source of toxins
2. Healthy diet
3. Treat vitamin and mineral deficiencies
4. Rule-out iron deficiency anemia
5. Clean filtered water
“Incorporating Nutrition Outcomes into the child’s IFSP or Goals into the IEP is an opportunity to designate the required nutrition services to address the child’s developmental and educational needs.”

Elizabeth Strickland, MS, RD, LD
| **IFSP**  
| (Individual Family Services Plan)  
| **Outcomes & Objectives**  
| A written plan for providing Early Intervention services to an eligible child and his family.  
| (Birth through 2 years of age)  
| **IEP**  
| (Individual Education Program)  
| **Goals & Objectives**  
| A written plan for providing Special Education and related services to a child with a disability covered under the IDEA.  
| (Age 3 through 21 years of age)  
|
IFSP and IEP

- Physical therapy
- Occupational therapy
- Speech therapy
- Behavioral therapies
- Support services
- Art
- Music
- Hippo

What is the missing piece?

⭐ Nutrition Therapy
Early Children Intervention

- R.D. are listed as qualified personnel to:
  - Serve on the EI & IFSP Team
  - Provide Nutrition Services (MNT)

- Include Nutrition Outcomes/Objectives in the IFSP
**IFSP Nutrition Outcomes**

1.) Improve child’s growth rate
   - Monitor weight & length once a month
   - RD teach parents how to maximize child’s caloric and nutrient intake

2.) Develop age appropriate feeding skills

3.) Consume a diet of age appropriate foods and beverages
Preschool - School

- R.D. considered qualified to provide a “related service” to assist a child with a disability to benefit from Special Education
- Nutrition Goals/Objectives in the IEP
- Meal Substitutions
- Implementation of the Nutrition Care Plan
- R.D. provides training and consultation to staff on the nutrition needs of CSHCN
Examples of Nutrition services that may be Funded through IDEA include:

- Special foods, supplements, feeding equipment
- Consultation services of a Registered Dietitian
- Special education teacher, OT, or other health professional in feeding the child or developing feeding skills.

Accommodating Children with Special Dietary Needs in the School Nutrition Programs
United States Dept. of Agriculture Food and Nutrition Service

www.fns.usda.gov/cnd
Nutrition services may be specified as:

1) Special education (specially designed instruction)

2) Related service (support services required to assist a child with a disability to benefit from special education)
Examples of Nutrition Goals

1.) Develop or refine age appropriate feeding skills
2.) Consume a diet of age appropriate foods and beverages
3.) Child will independently follow his dietary restrictions
4.) Develop meal planning, grocery shopping, and cooking skills
Examples of Nutrition Related Services

1. Provide a healthy morning and afternoon snack.
2. Staff to add food fortifiers to foods at lunch and each snack.
3. Assigned school staff member monitor child’s lunch and snack choices to minimize diet error and facilitate independent choices.
4. School nurse measure child’s weight and height once a month.
5. RD review and modify school menus to accommodate child’s dietary restrictions.
6. RD to consult with School Cafeteria Manager as needed.
7. GFCF food substitutions used at lunch will be provided by the school.
8. Do NOT use food as a reward system or reinforcer.
9. Behavioral specialist suggest nonfood reward system/reinforcer to be used in place of food.
Related Service: Provide child with a healthy nutrient-dense snack at 9:00am in the morning.

*Purpose - prevent hypoglycemia which negatively impacts his brain function, behavior, academic performance, and ability to benefit from special education services.
Related Service: Provide child with a non-food reward system vs. candy or food.

*Purpose – child is a problem feeder; candy or food used as a reward provided between meals and snacks interferes with his normal eating pattern negatively impacting his intake of healthy meals and snacks.
Federal Regulations

USDA, regulations 7 CFR Part 15b

Require substitutions or modifications in school meals for children whose disabilities restrict their diet.

- Supplement the IEP with a written statement
- Health Care Plan
- IEP

Accommodating Children with Special Dietary Needs in the School Nutrition Programs

United States Dept. of Agriculture Food and Nutrition Service

www.fns.usda.gov/cnd
Date: ______________________________
Name of Child: _____________________________ Date of Birth: _________
Child's disability: _______________________________________________________

Describe why the disability restricts the child’s diet: _______________________________________________________

Describe the major life activity affected by the child’s disability: ___________________________________________________

List foods to be omitted from the child’s diet and the choice of foods that must be substituted:
___________________________________________________________________________________________
___________________________________________________________________________________________
___________________________________________________________________________________________
___________________________________________________________________________________________

__________________________________________
Signature of Licensed Physician Date
“Child requires a Gluten Free Casein Free Diet to benefit from his special education program. Gluten and casein negatively impacts child’s behavior and ability to learn. Following the restrictive diet is an independent living skill the child must learn to master.”

Present Level of Performance: Child can not identify which foods are unsafe for him to eat.

Annual Goal: Child will identify “safe” vs. “unsafe” foods so he can independently follow his dietary restrictions.
Short-Term Objectives:
1. By December 2010, child will be able to correctly identify an “unsafe” food 25% of exposures.
2. By March 2011, child will be able to correctly identify an “unsafe” food vs. a “safe” food 50% of exposures.
3. By May 2011, child will be able to correctly identify an “unsafe” food vs. a “safe” food 90 - 100% of exposures.

How progress will be measured: Teacher made tests.

Special Education:
1. Special education teacher will provide special instruction and learning activities to teach child “safe” vs. “unsafe” foods
2. Special education teacher will use positive reinforcement for correct food choices

Start Date: September 1
Location: Resource room
Frequency: Thirty minutes, two times per week
Duration: May 28
Related Services:

1. Registered Dietitian will provide technical assistance to Special Education Teacher.
2. GFCF foods used for lunch will be provided by the school.
3. RD to review school lunch menu once per month and recommend food substitutions.
4. RD to provide technical assistance to cafeteria manager as needed.
5. Assigned school staff member will monitor child at lunch and snack to minimize diet noncompliance.
FEEDING SKILLS

**PLOP:** Child requires prompting to self feed, prefers to use fingers, and does not use utensils.

**Goal:** Child will develop age appropriate self feeding skills using utensils.

**Objectives:** Child will consume his meals with a fork and spoon without any assisted feeding or prompting.

**How progress will be measured:**

**Special Education:** Occupational Therapy
Start Date: _______________________
Location: _______________________
Frequency: _______________________
Duration: _______________________

**Related Services:**
AGE APPROPRIATE FOODS

**PLOP:** Child refuses new foods, accepts only soft foods, and eats less than five different foods.

**Goal:** Child will consume a variety of age appropriate foods and textures.

**Objectives:** Child will consume greater than 20 different foods of different textures without resistance.

**How progress will be measured:**

**Special Education:** Occupational Therapy and/or Speech Therapy

**Start Date:**

**Location:**

**Frequency:**

**Duration:**

**Related Services:** OT and/or SLP will receive training on the Sequential Oral Sensory Approach to Eating (SOS).
IFSP/IEP Nutrition Resources

1. Special Education Law
   Peter Wright  www.wrightslaw.com

2. Writing IEP
   Dr. Barbara Bateman

3. Accommodating Children with Special Dietary Needs in School Nutrition Programs
   USDA, Food and Nutrition Service

4. Book: Eating for Autism
   Appendix 4: IEP Nutrition Goals & Objectives
   Elizabeth Strickland, MS, RD, LD
   www.ASDpuzzle.com
It's QUESTION TIME!!
Summary

Nutrition Therapy plays a critical role in helping to treat children with Autism Spectrum Disorder.
Thank you!!!

Pass on the message…
Nutrition is a piece of the Autism puzzle!

Elizabeth Strickland, MS, RD, LD
Telephone: (830) 237-2886
Email: ASDpuzzle@aol.com
Website: www.ASDpuzzle.com
To comply with professional boards/associations standards:

- I declare that I or my family do not have any financial relationship in any amount, occurring in the last 12 months with a commercial interest whose nutritional products are discussed in my presentation. Additionally all Planner’s involved do not have any financial relationship.
- Requirements for successful completion is attendance for the full day seminar, if not, amended CE will be granted accordingly based on your boards/associations requirements along with a completed evaluation form.
- Cross Country Education and all current accreditation statuses does not imply endorsement of any commercial products displayed in conjunction with this activity.

**Nutrition and Feeding Interventions for Autism Spectrum Disorder & ADHD**

Elizabeth Strickland, M.S., R.D., L.D.

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- Requirements for successful completion is attendance for the full day seminar, if not, amended CE will be granted accordingly based on your boards/associations requirements (rules) along with a completed evaluation form.
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Product: Eating for Autism Book
Service: Nutrition Therapy

Cross Country Education
Leading the Way in Professional Development
www.CrossCountryEducation.com
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