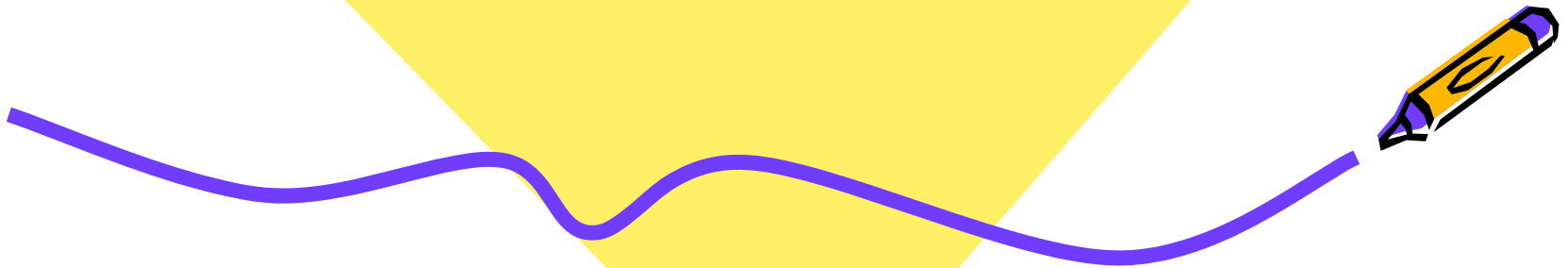


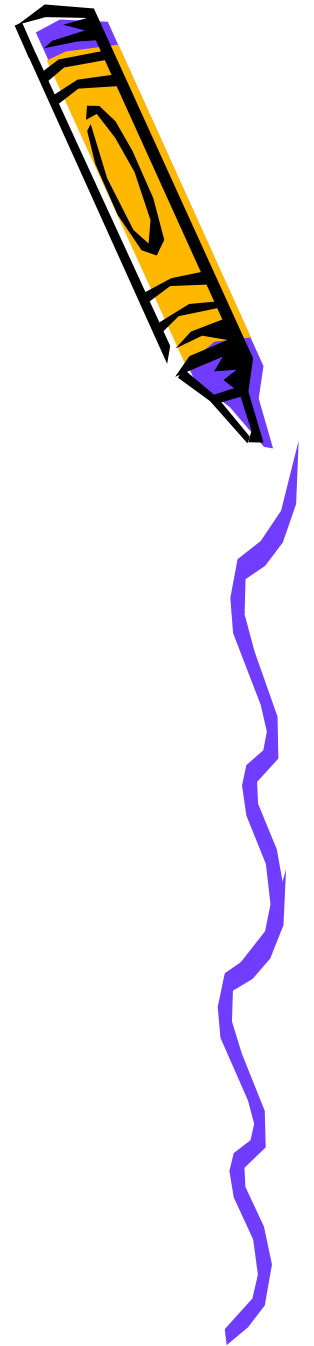
Children and Nutrition

Presented by: Kathryne C. Smith, MSPT



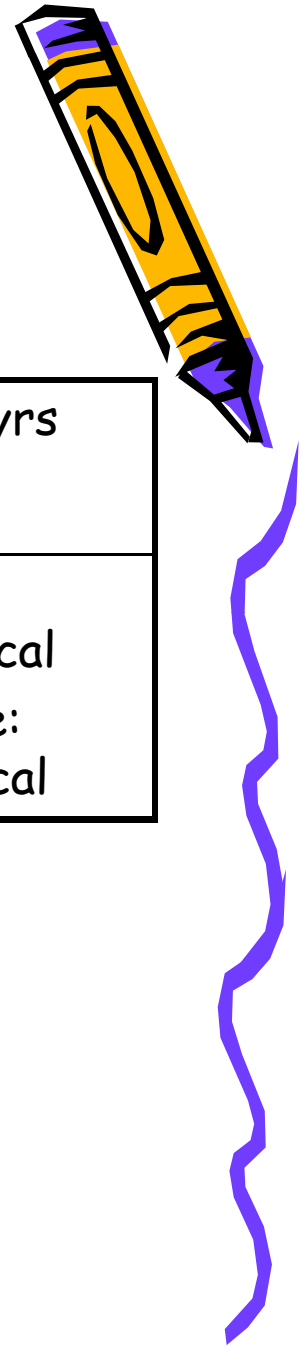
Will Focus On...

- Basic Nutrition for Children
- Childhood Obesity
- Special Diets
- Malnutrition
- Evidence Based Practice



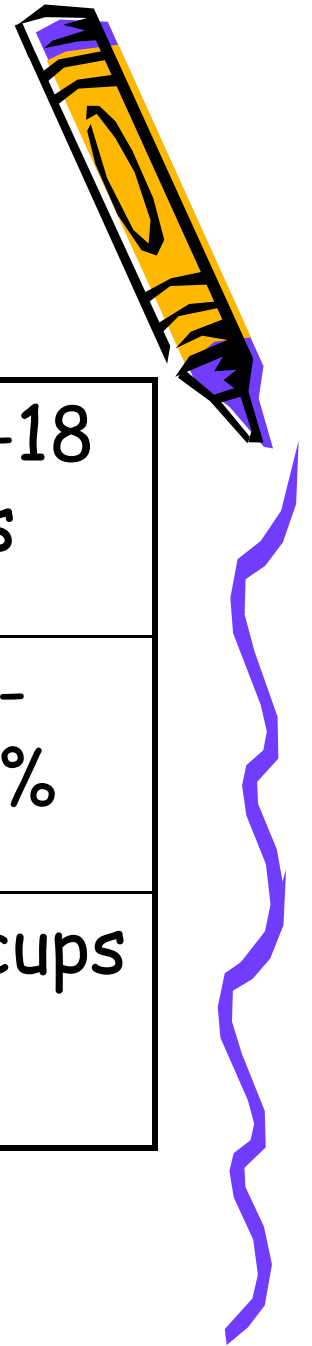
Childhood Nutrition: Calorie Intake

1 year	2-3 yrs	4-8 yrs	9-13 yrs	14-18 yrs
900 kcal	1000kcal	Male: 1400kcal Female: 1200kcal	Male: 1600kcal Female: 1600 kcal	Male: 2200kcal Female: 1800kcal

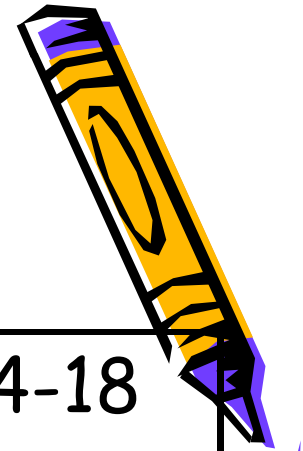


Dietary Recommendations for Children

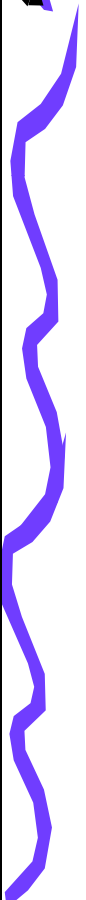
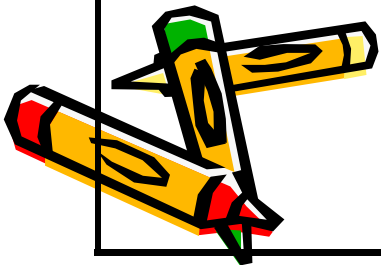
Age:	1 yr	2-3 yrs	4-8 yrs	9-13 yrs	14-18 yrs
Fat:	30-40%	30-35%	25-35%	25-35%	25-35%
Milk/ Dairy	2 cups	2 cups	2 cups	3 cups	3 cups



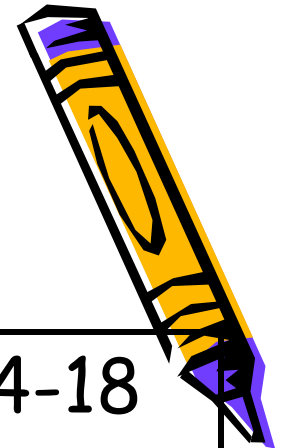
Recommendations Con't



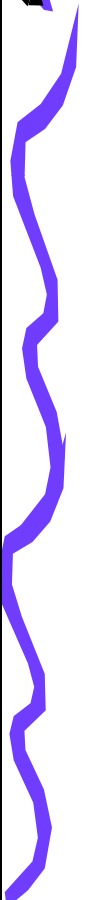
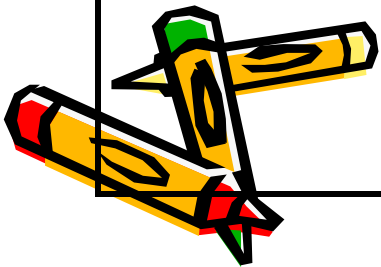
Age:	1 yr	2-3 yrs	4-8 yrs	9-13 yrs	14-18 yrs
Lean Meat/ Beans	1.5 oz	2oz	Male: 4 oz Female: 3 oz	5 oz	Male: 6 oz Female: 5oz
Fruits	1 cup	1 cup	1.5 cups	1.5 cups	Male: 2 cups Female: 1.5 cups



Recommendations Con't

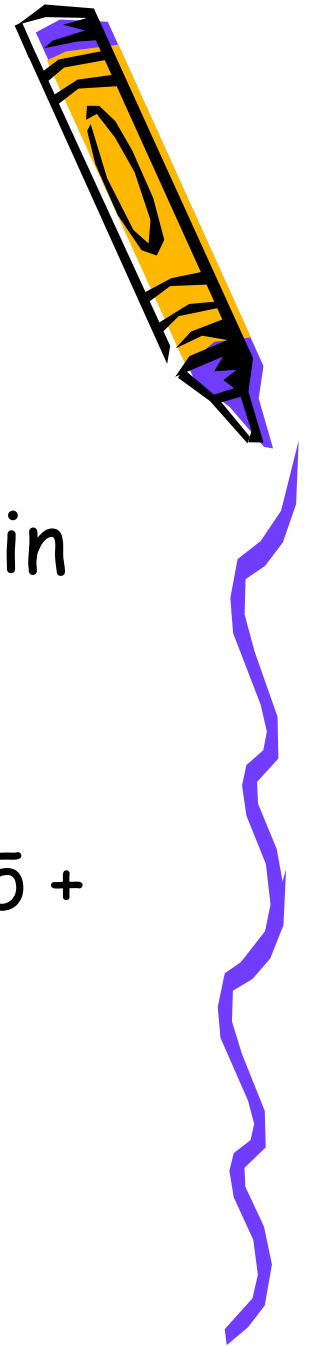
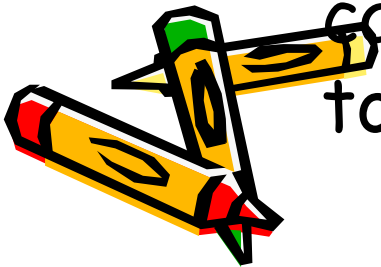


Age:	1 yr	2-3 yrs	4-8 yrs	9-13 yrs	14-18 yrs
Vegetables	$\frac{3}{4}$ cup	1 cup	Male: 1.5 cups Female: 1 cup	Male: 2.5 cups Female: 2 cups	Male: 3 cups Female: 2.5 cups
Grains	2 oz	3 oz	Male: 5 oz Female: 4 oz	Male: 6 oz Female: 5 oz	Male: 7 oz Female: 6 oz



Fiber and Children's Diets

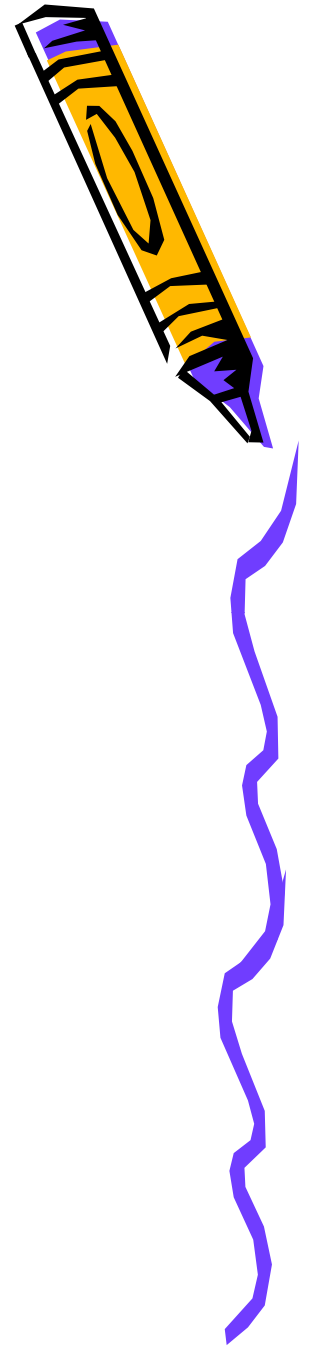
- Majority of calories should come from complex carbohydrates high in fiber
- "Age plus 5"
 - Example: A 5-yr old should consume $5 + 5 = 10$ grams of fiber per day
 - Once a child's caloric intake is 1500 calories or more, 25 grams should be tolerated



Childhood Obesity

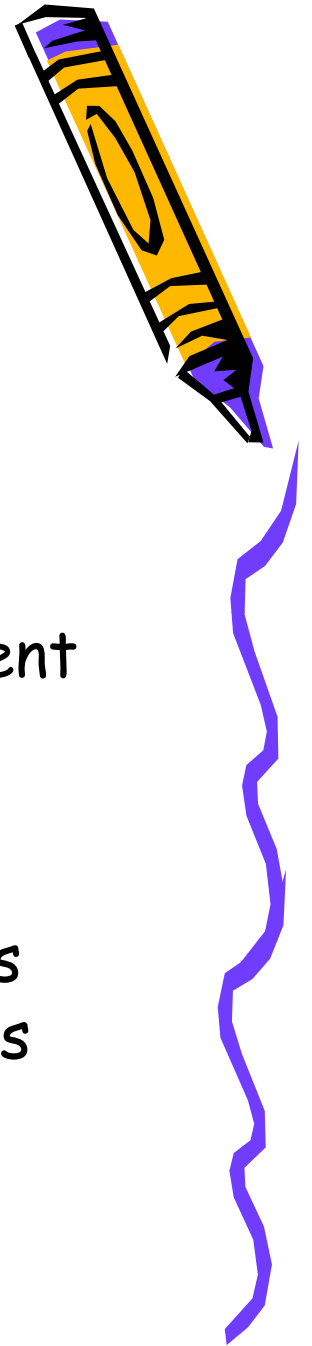
- Incidence
- Causes
- Risks
- Assessment
- Treatment
- Prevention

Schools and Nutrition



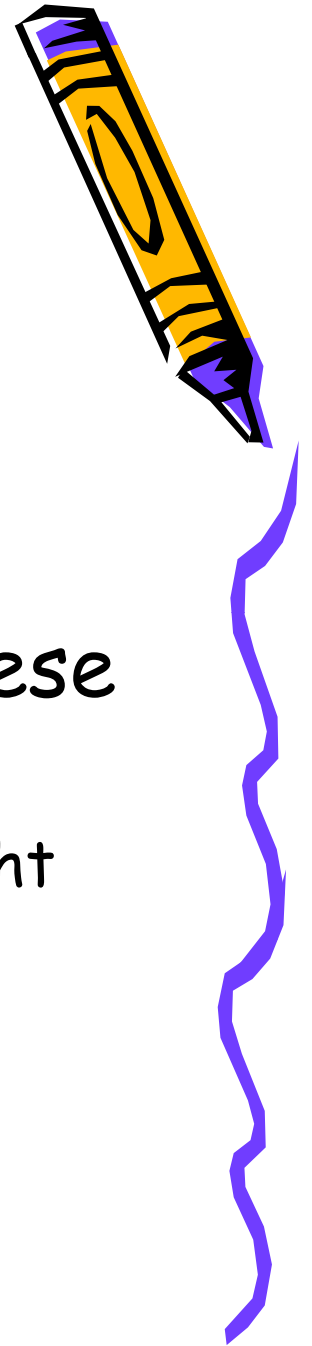
Incidence

- Among 6-11 years:
 - Whites: 11.9% boys, 12% girls
 - African Americans: 17.6% boys, 22.1% girls
 - Mexican Americans: 27.3% boys, 19.6 percent of girls
- Among 12-19 years:
 - Whites: 13% boys, 12.2% girls
 - African Americans: 20.5% boys, 25.7% girls
 - Mexican Americans: 27.5% boys, 19.4% girls



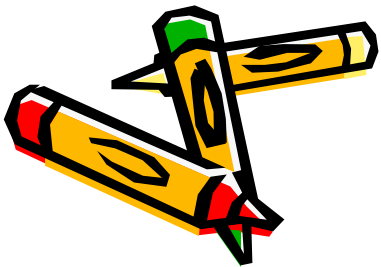
Definitions of Obesity

- 85th percentile of BMI defines overweight
- 95th percentile of BMI defines obese
- What is BMI?
 - Assesses your body weight relative to height
 - Less than 18.5 is underweight
 - 18.5-24.9 is healthy
 - 25-30 is overweight
 - Greater than 30 is obese





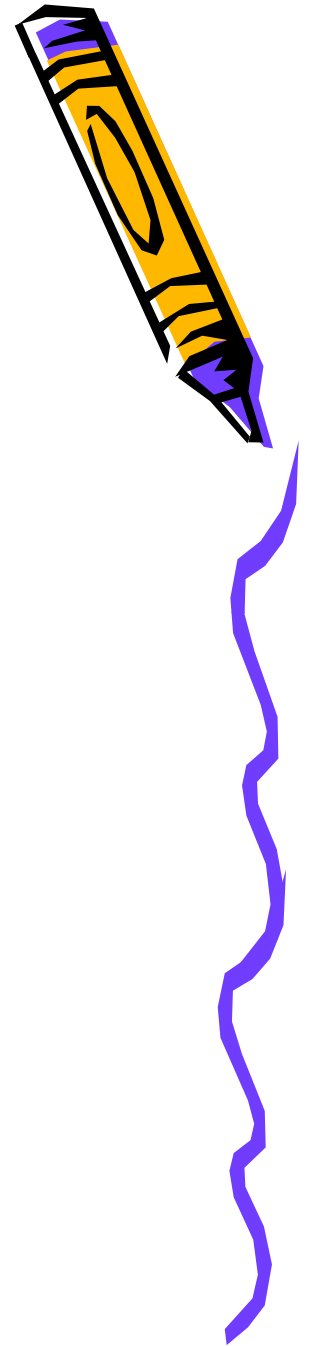
- To calculate:
 - $\text{Weight in pounds} \times 703 / \text{height in inches} / \text{height in inches}$
 - Example: $150\text{lbs} \times 703 = 105450 / 65$
 $\text{inches} = 1622 / 65 \text{ inches} = 24.9\% \text{ BMI}$



Causes

- Lack of exercise
- Sedentary behavior
- Socioeconomic status
- Eating habits
- Environment
- Genetics

Medical reasons



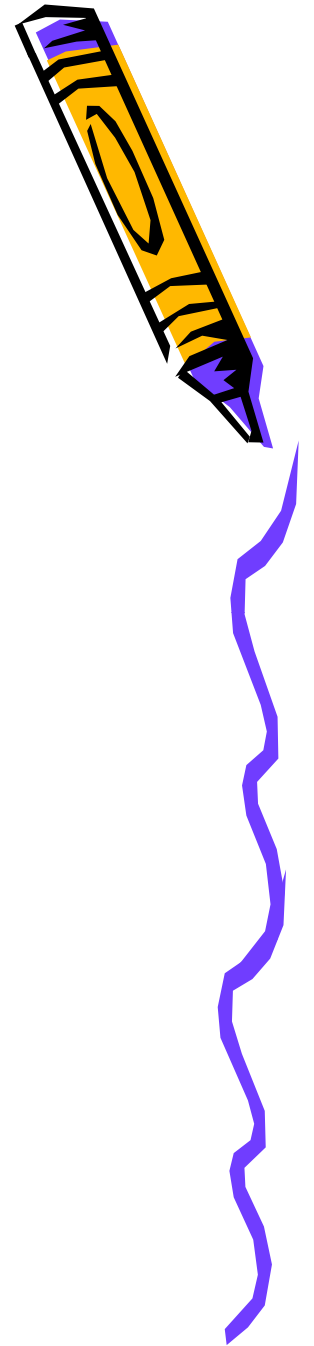
Idiopathic vs. Endogenous

- >90% cases
 - Tall stature
 - History of Obesity
 - Mental function normal
 - Normal or advanced bone age
 - Physical exam normal
- <10% cases
 - Short stature
 - History uncommon
 - Often mentally impaired
 - Delayed bone age
 - Associated stigmata



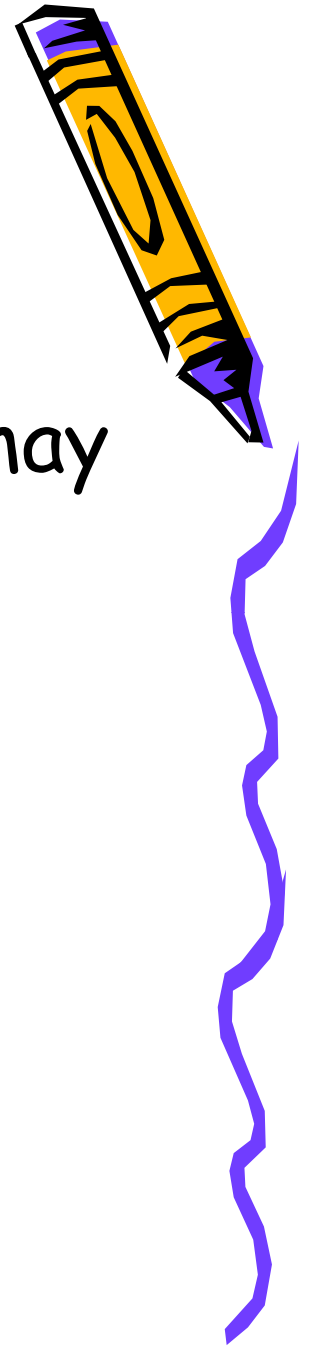
Associated Health Risks

- Type 2 diabetes
- Asthma
- Hypertension
- Orthopedic problems
- Sleep apnea
- Psychosocial consequences

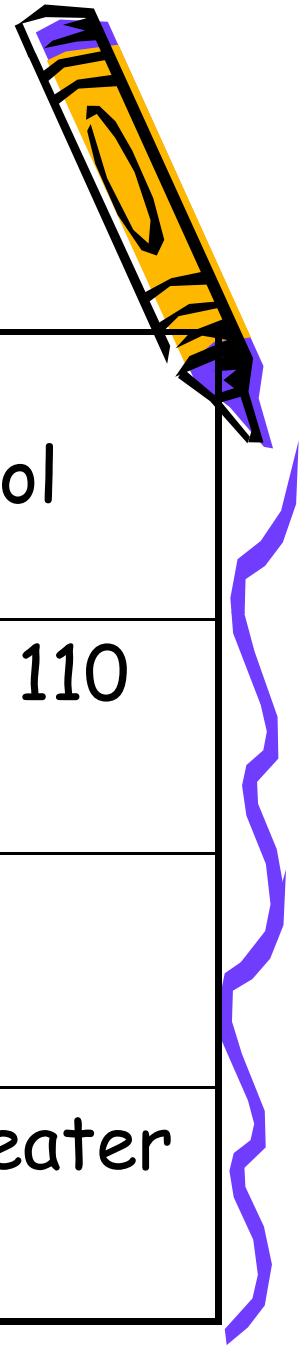


Cholesterol and Atherosclerosis in Children

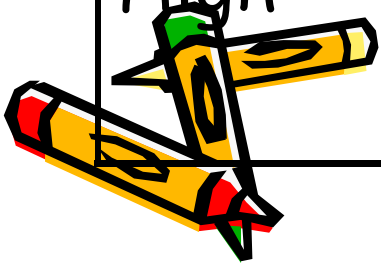
- Elevated cholesterol early in life may cause atherosclerosis in adults
- To reduce risk:
 - Discourage cigarette smoking
 - Aerobic exercise
 - Treat high blood pressure
 - Avoid or reduce obesity
 - Treat diabetes mellitus



Cholesterol levels in Children 2-19 years old



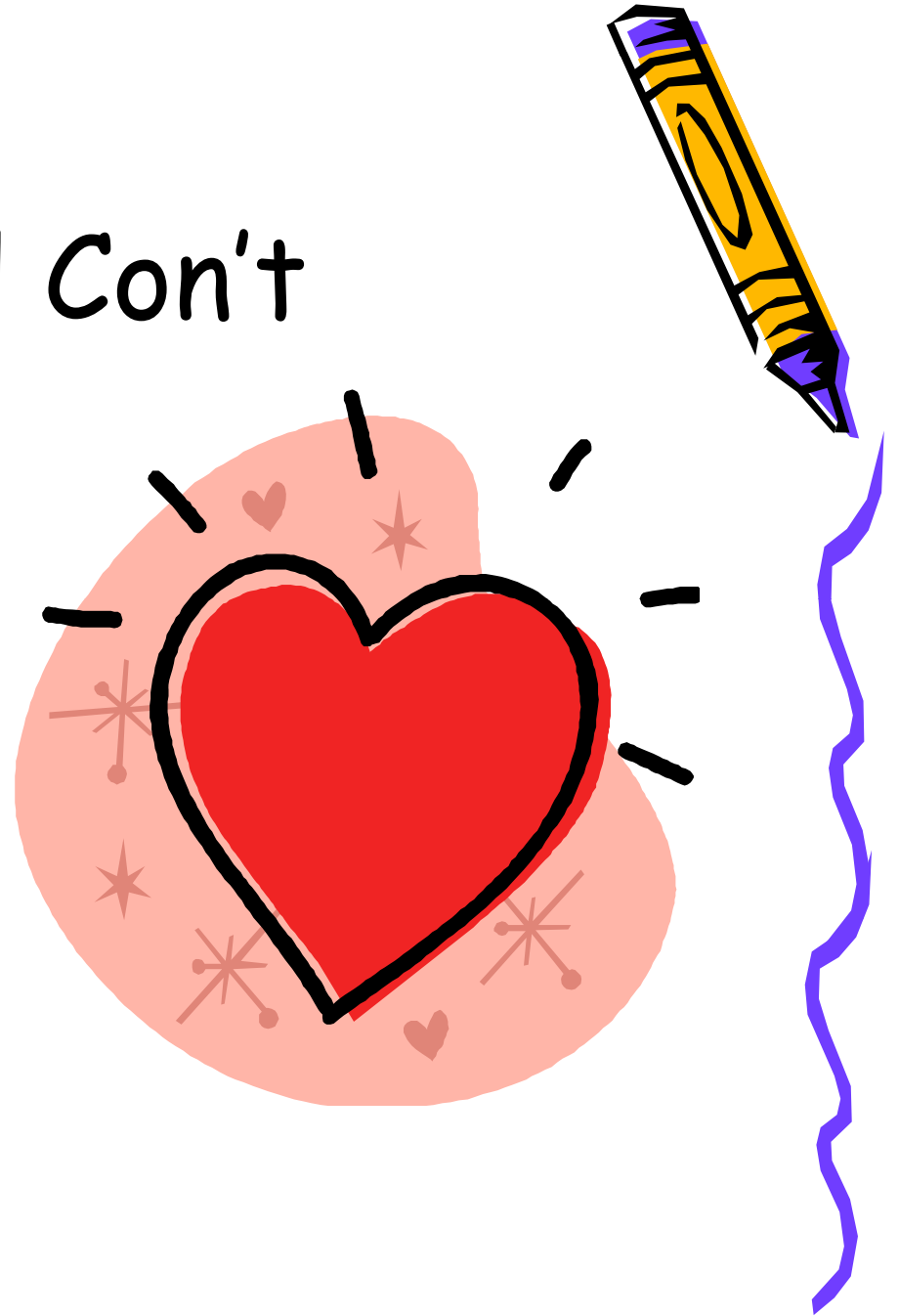
Category	Total Cholesterol (mg/dL)	LDL Cholesterol (mg/dL)
Acceptable	Less than 170	Less than 110
Borderline	170-199	110-129
High	200 or greater	130 or greater



Cholesterol Con't

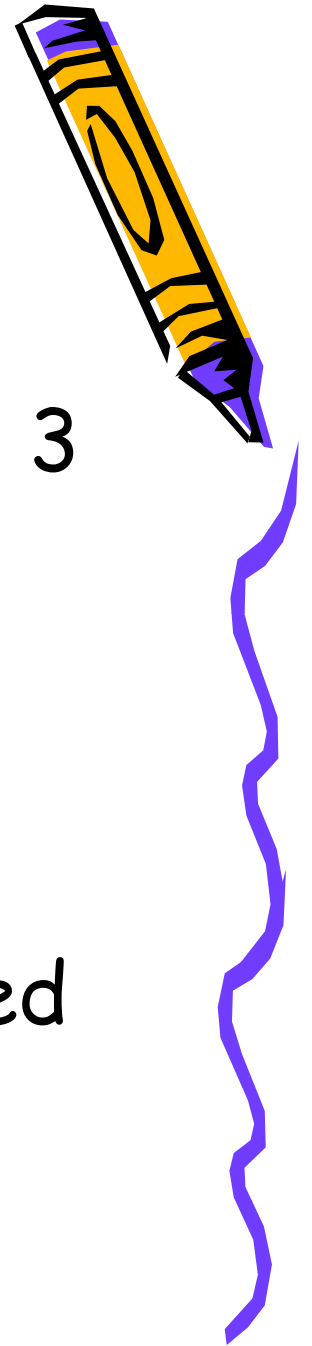
HDL should be
greater than or
equal to 35 mg/dL

Triglycerides should
be less than or
equal to 150 mg/dL



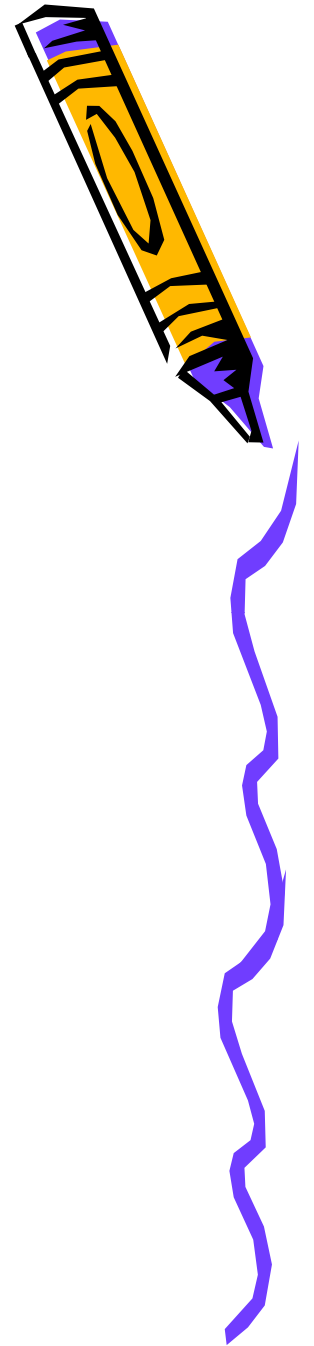
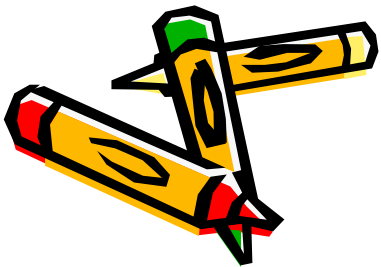
High Blood Pressure in Children

- AHA recommends that all children 3 and older have yearly BP measurements
- In childhood, BP usually rises with age
- Child's sex, age, and height are used to determine blood pressure percentiles



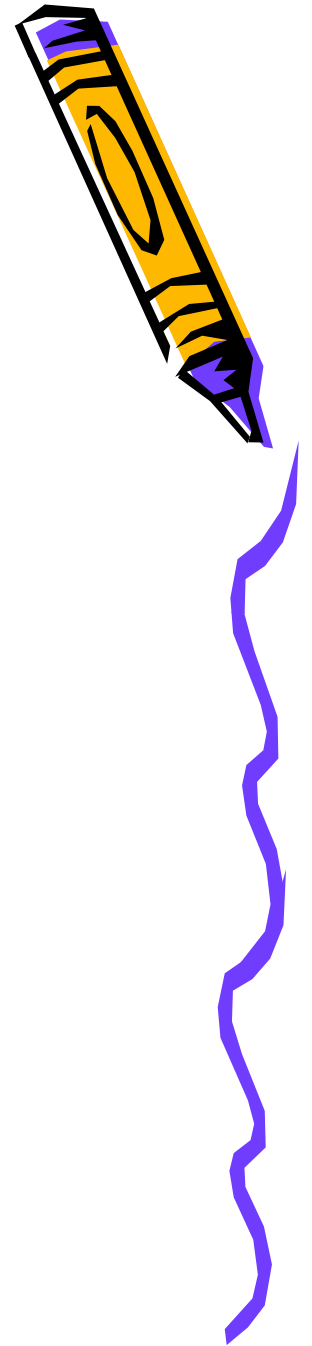
Assessment of Childhood Obesity

- Medical History
- Social History
- Physical Examination
- Dietary History
- BMI calculations
- Laboratory Evaluation



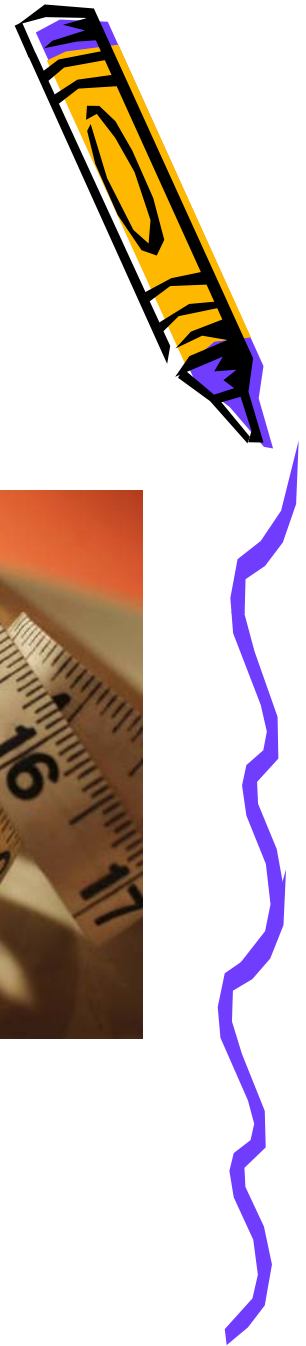
Treatment of Childhood Obesity

- PREVENTION
- Setting goals for weight loss
- Dietary Management
- Physical Activity
- Behavior Modification
- Family Involvement



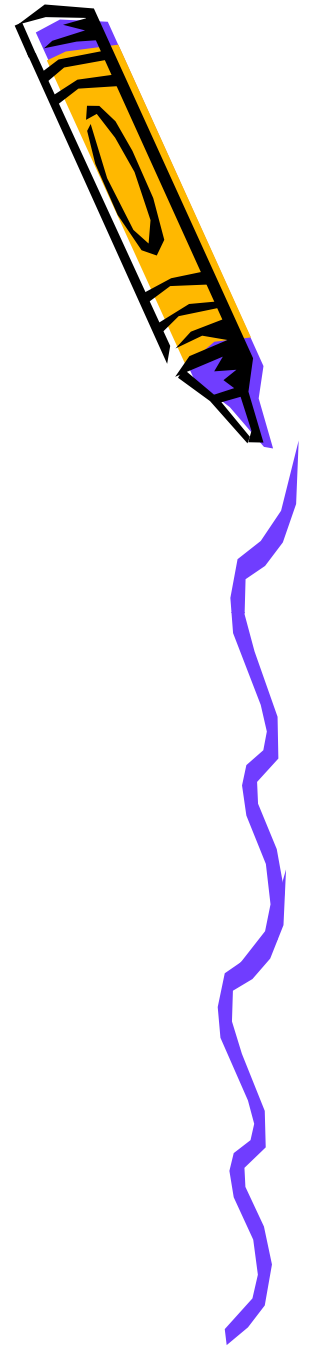
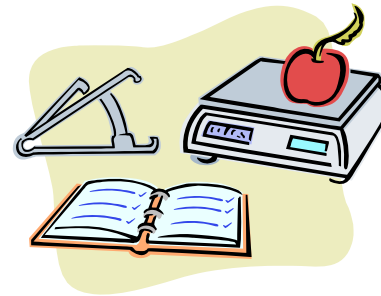
Setting goals for weight loss

- Should be obtainable and allow for normal growth
- Initially, should be small
- 5-10 pounds, or 1-4 pounds per month



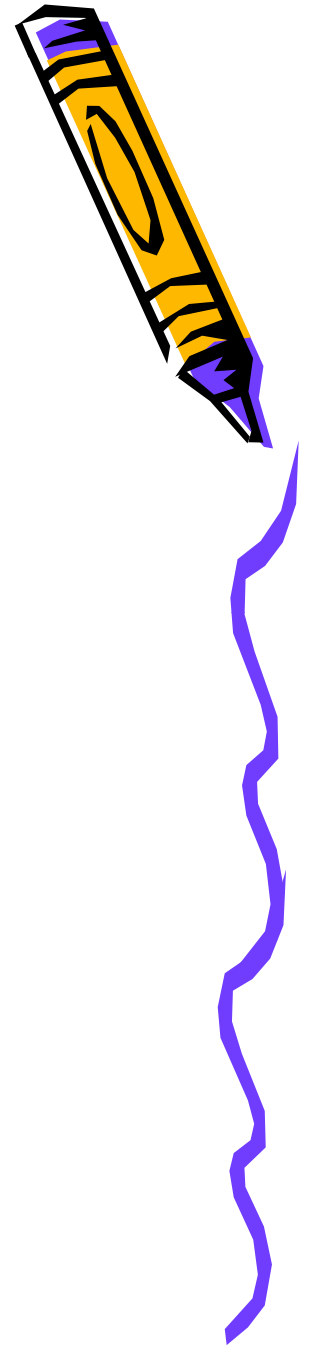
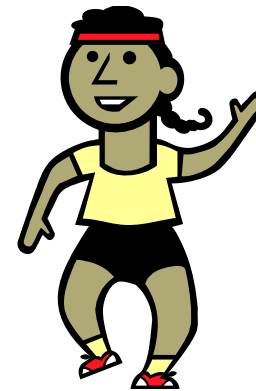
Dietary Management

- Maintain a food record
- Calorie per day recommendation
- Dietary fiber
- Nutrition consultant



Physical Activity

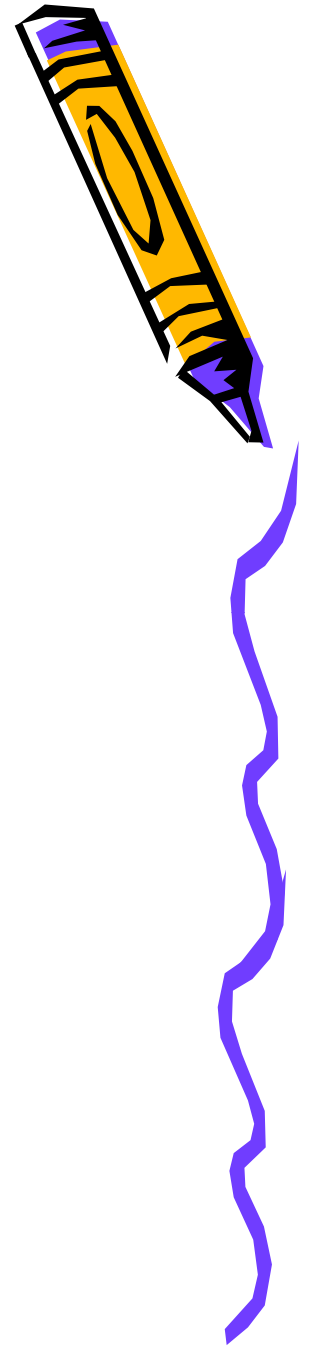
- Initially, should be small and increased slowly
- 20-30 minutes per day of moderate activity, in addition to what child already gets in school



Behavior Modification

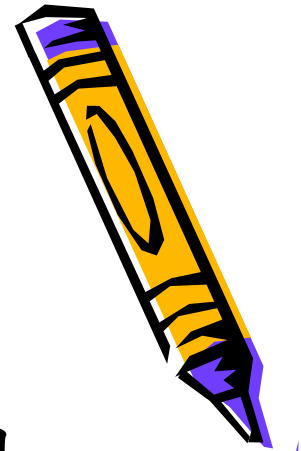
- Self-monitoring
- Nutritional education
- Stimulus control
- Modification of eating habits
- Physical Activity
- Attitude change

Reinforcements and rewards



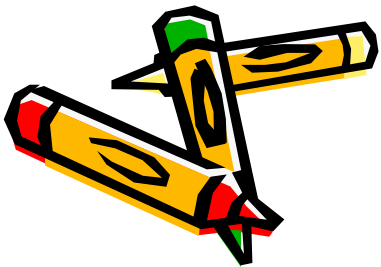
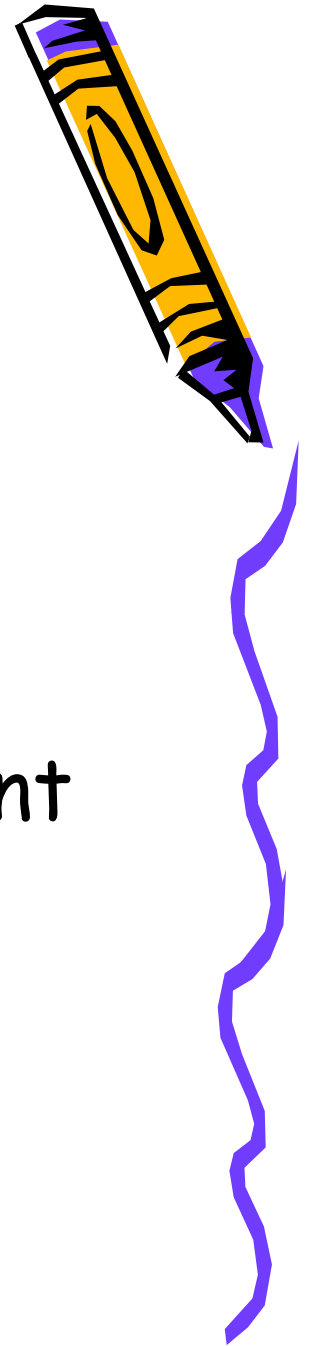
Family Involvement

- Many studies have demonstrated a familial aggregation of risk factors for obesity, and family provides the child's major social learning environment
- Long-term (10 years) effectiveness of weight control program is significantly improved when intervention is directed at the parents as well as the child



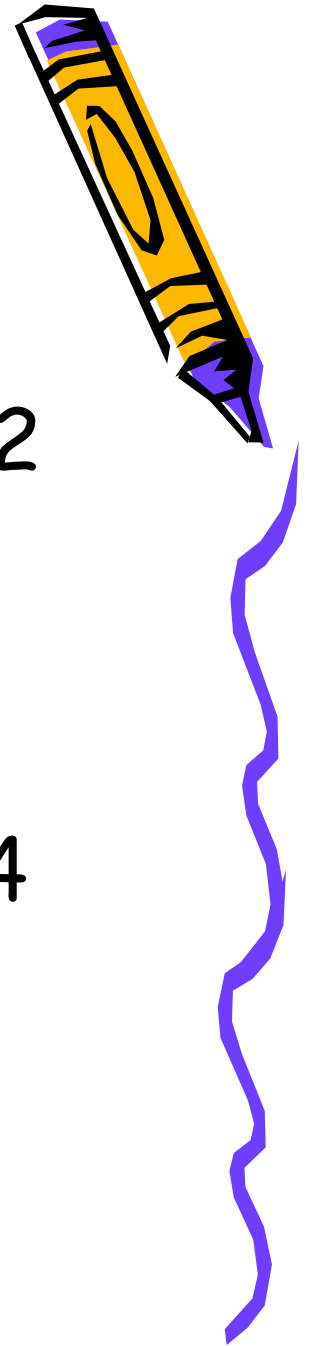
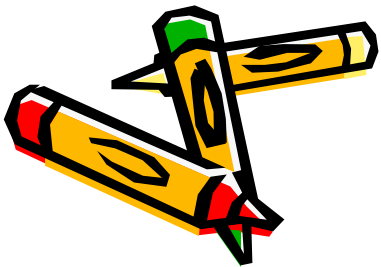
Prevention

- Families are most important role models for children
- Create an active environment
- Create a healthy eating environment



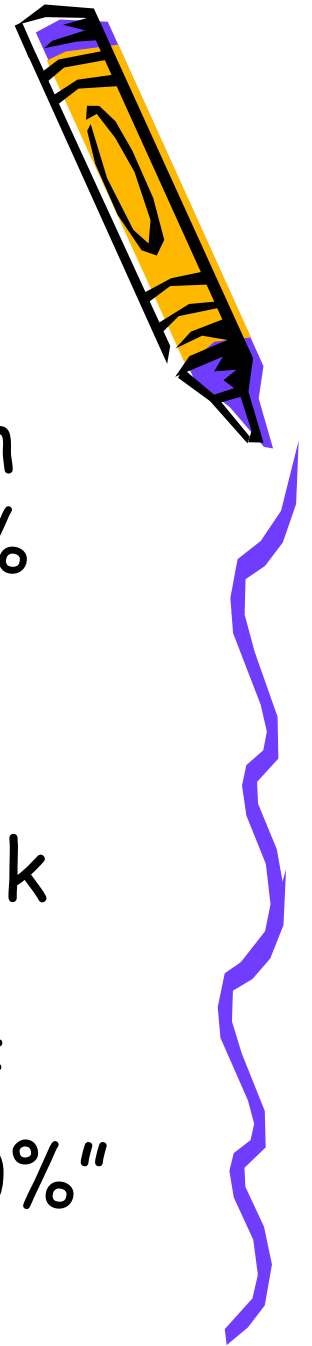
Exercise and Children

- AHA recommends all children age 2 and older should participate in at least 30 minutes of moderate-intensity exercise per day
- 30 minutes of vigorous activity 3-4 times a a day



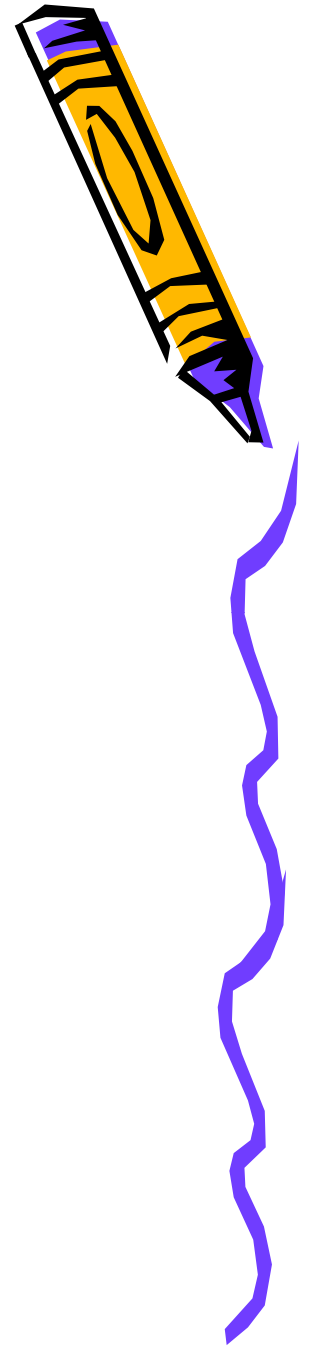
Schools and Nutrition

- CDC "51% of children eat less than one serving a day of fruit, and 29% eat less than one serving of vegetables"
- USDA "Children drink 16% less milk now than in 1970's and 16% more carbonated drinks. Consumption of non-citrus juices increased by 280%"

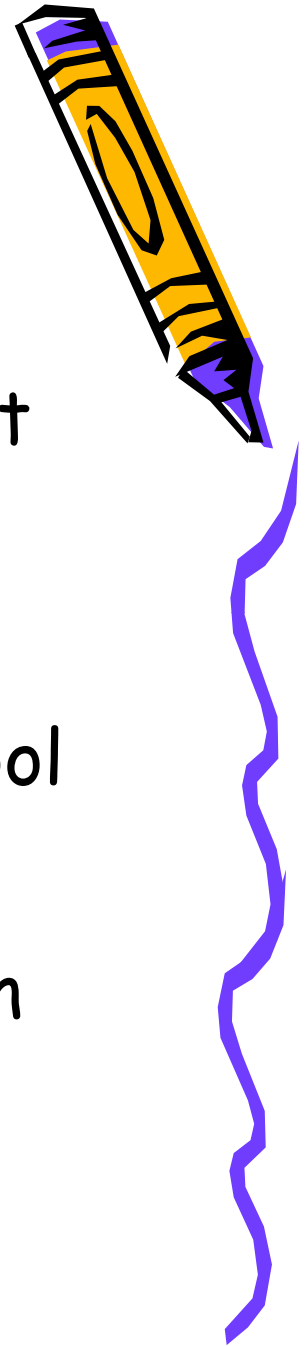


"Prescription for Change: 10 Keys to Promote Healthy Eating in Schools"

1. Assess eating environment
2. Adequate funds provided
3. Behavior-focused nutrition education
4. School meals will meet USDA nutrition standards.
5. Designated lunch periods of sufficient length

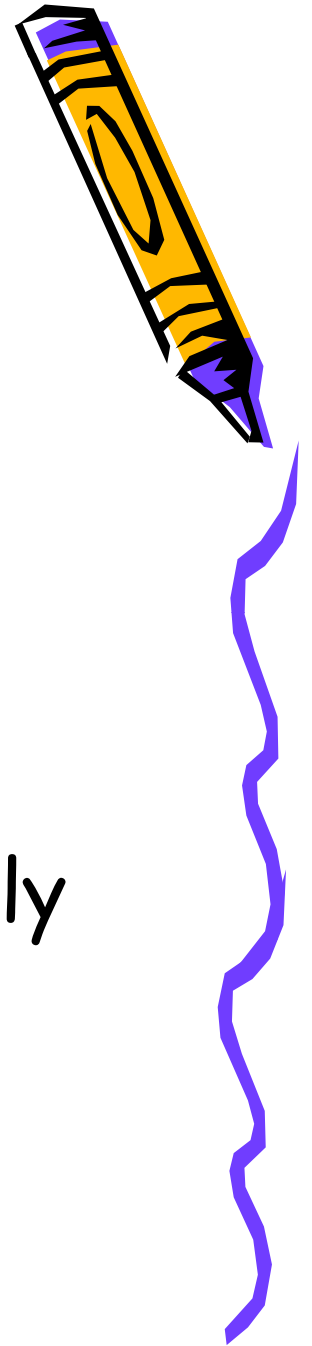


6. Enough serving areas with minimum wait time
7. Adequate space
8. Role models
9. Foods sold in addition to National School Lunch Program will be from the Food Pyramid.
10. Sale of foods will be based on nutrition not profit making

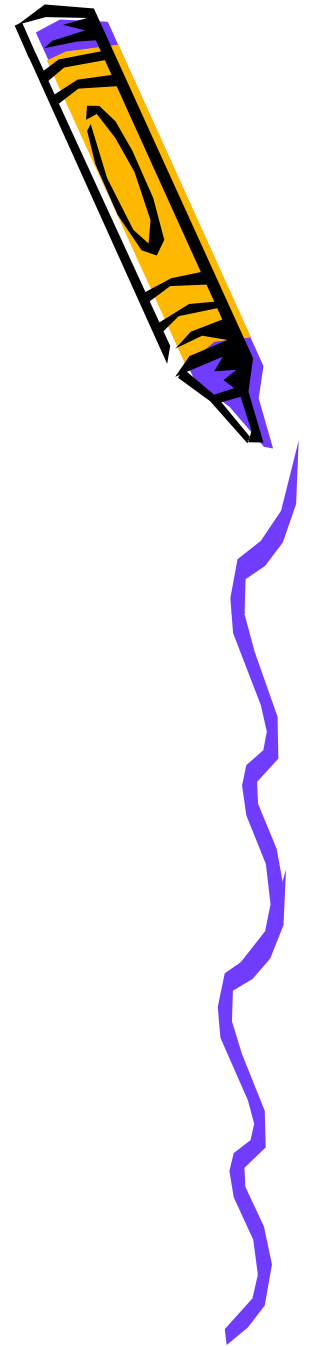
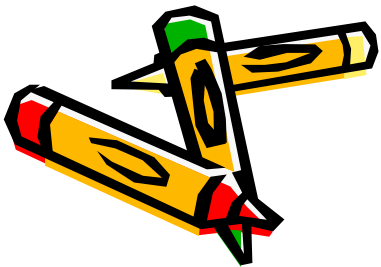


Create an Active Environment

- 1. Establish policies that promote lifelong physical activity
- 2. Provide physical and social environments
- 3. PE instruction: instruct physically active lifestyle
- 4. Health Education classes
- 5. Extracurricular Activities

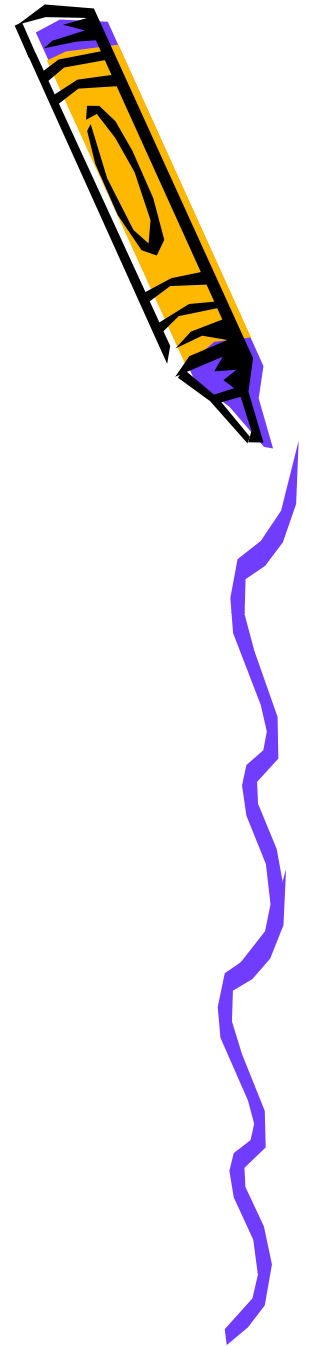
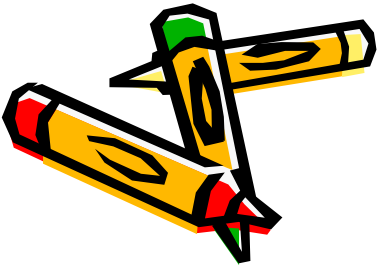


- 6. Family Involvement
- 7. Training
- 8. Health Services
- 9. Community Programs
- 10. Evaluation



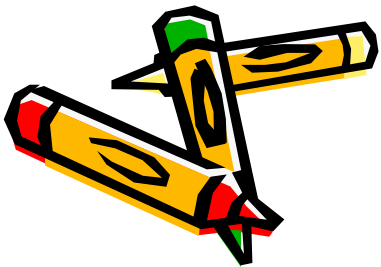
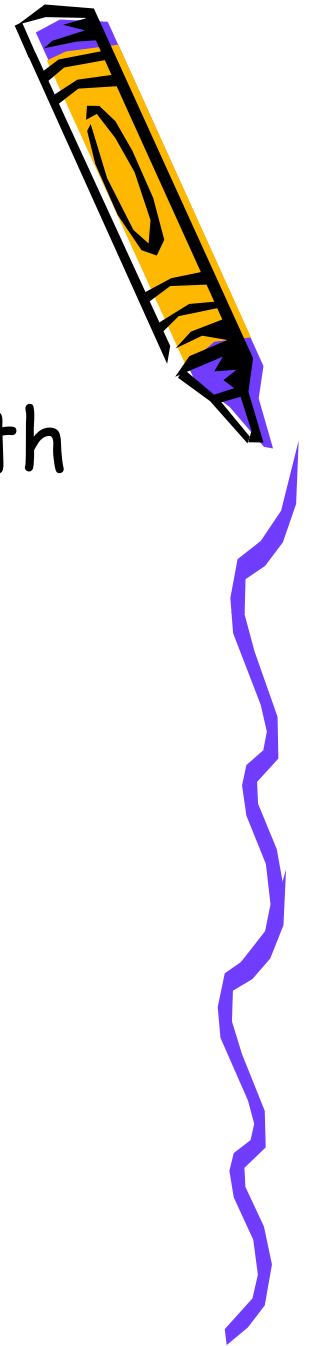
Ketogenic Diet

- What is it...
- History
- How does it work
- Who can use it



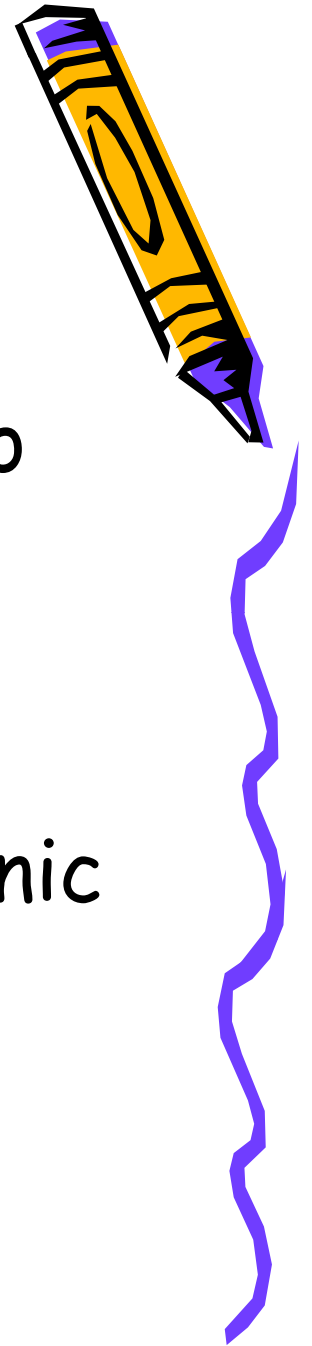
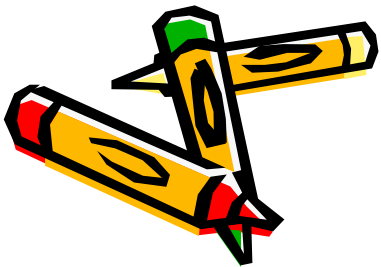
What is the ketogenic diet?

- A high fat diet, which may help with epilepsy, specifically in children
- Goal: supplement carbs with fats



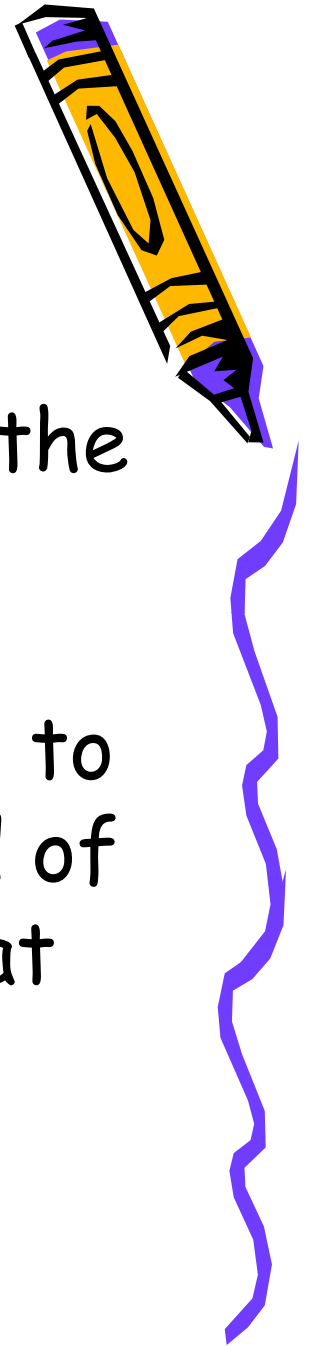
History

- Not a new treatment: reference to fasting as a cure for "fits" in the Bible
- High fat-low carb diet was introduced in 1921 at the Mayo Clinic



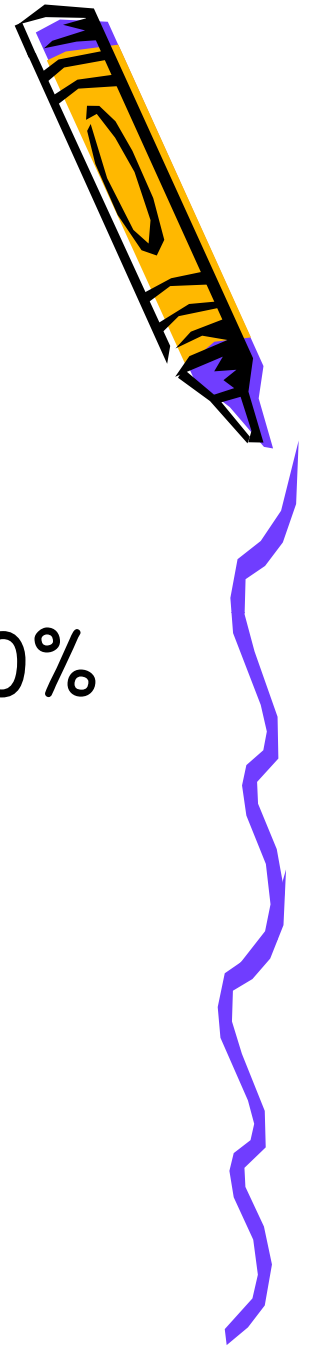
How does it work?

- If there is not enough energy for the body to work, the body burns glucose, then fat, then protein. As fasting continues, the brain starts to use ketones from body fat instead of glucose. This becomes ketosis. That is all that is known.



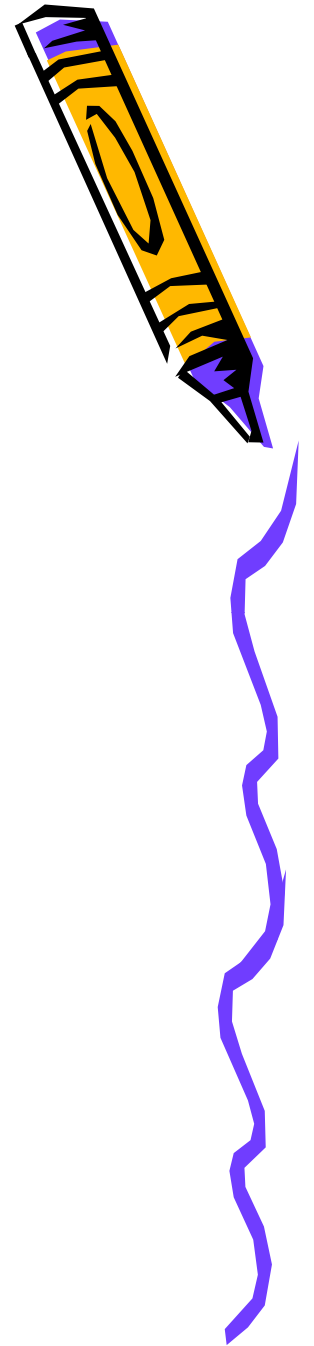
Who can use this diet?

- Mostly used for children from 1-6 years old
- 30% show marked improvement. 40% show no or small improvement, and 30% have an adverse reaction



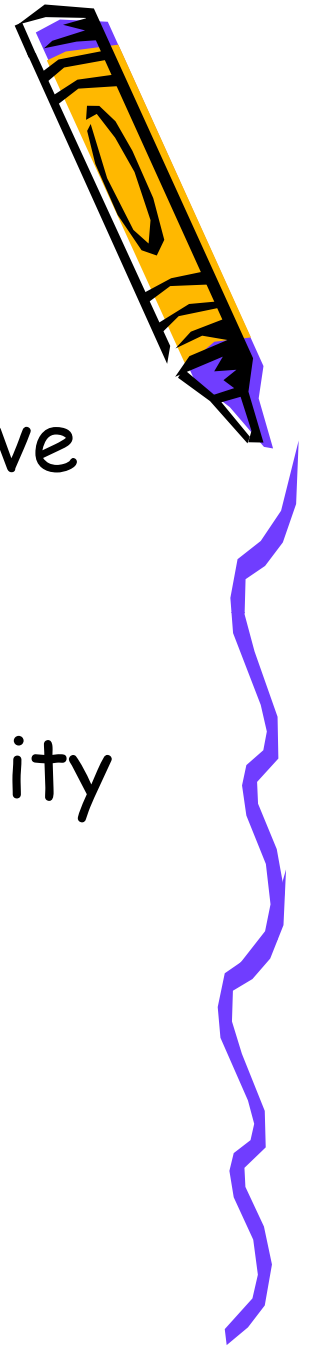
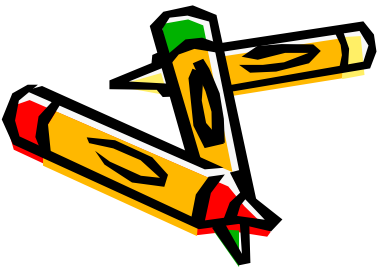
Gluten-Free/Casein-Free Diet

- Statistics
- What is it?
- How does it work?
- Evaluation
- How to implement



Statistics

- Over 500,000 people in the US have been diagnosed with some form of autism
- Studies have shown that the inability to break down certain foods may affect neurologic processes in children



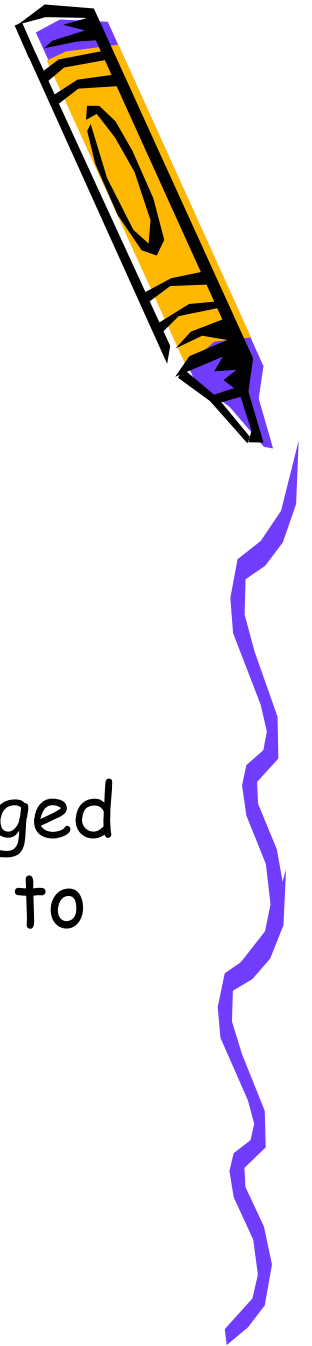
What is gluten?

- Glutens are a form of proteins that are normally broken down into amino acids which are digested in the intestines
- If this digestion is incomplete they may continue to be active and result in symptoms of autism
- Found in wheat and grain products

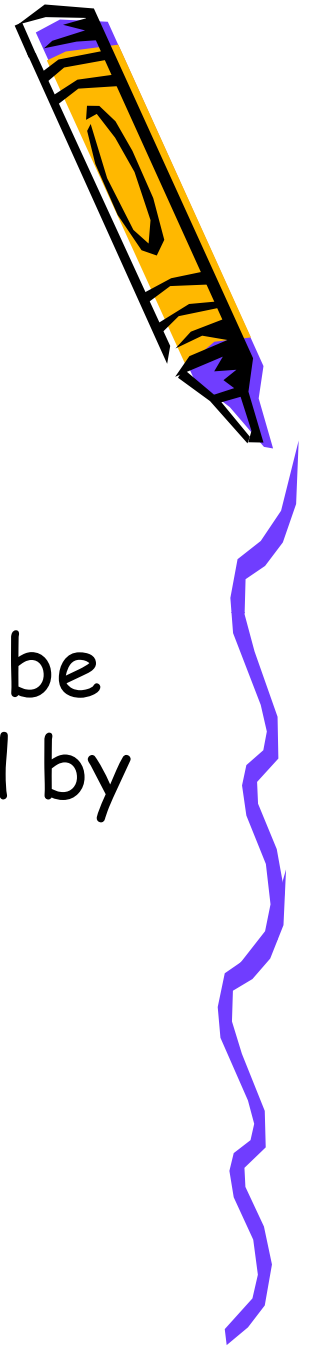


How does extra amino acids cause symptoms of autism?

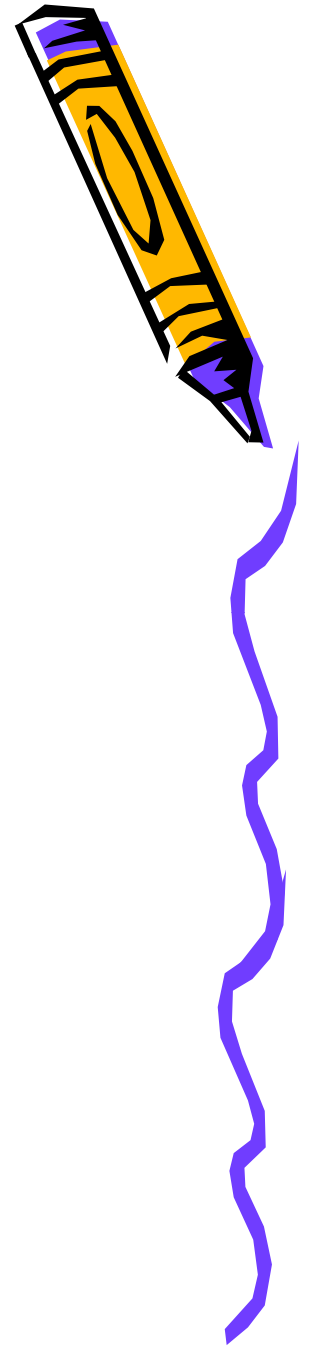
- Majority of extra peptides will be deposited in urine, but a few will cross over into the cerebrospinal fluid of the brain and cause an "opiate like" effect
- Theory: many autistic kids have a damaged intestine/gut which allows the proteins to pass into the bloodstream



- Because they cause an opiate effect—they are addicting
- The damage to the intestines may be present at birth, or may be caused by an immunological injury



- Alan Friedman—from Johnson and Johnson found morphine related compounds (dermorphin and deltorphin II) in urine of children
- Up until this point, these had only been found in poison dart frogs in South America



- These compounds were found to be 1000 times more potent than morphine
- Bacteria or fungus on skin on frogs is what causes these compounds—thus, bacteria or fungus in gut must be causing these in the children



Why are these compounds found in the children?

- An enzyme in the small intestines is normally responsible for breaking down morphine-related peptides, and something is wrong with this enzyme



What is casein?

- Phosphorprotein of milk
- Molecular structure similar to gluten
- Breaks down in the stomach to form a peptide known as casomorphine, will have opioid effects
- Found in milk and dairy products



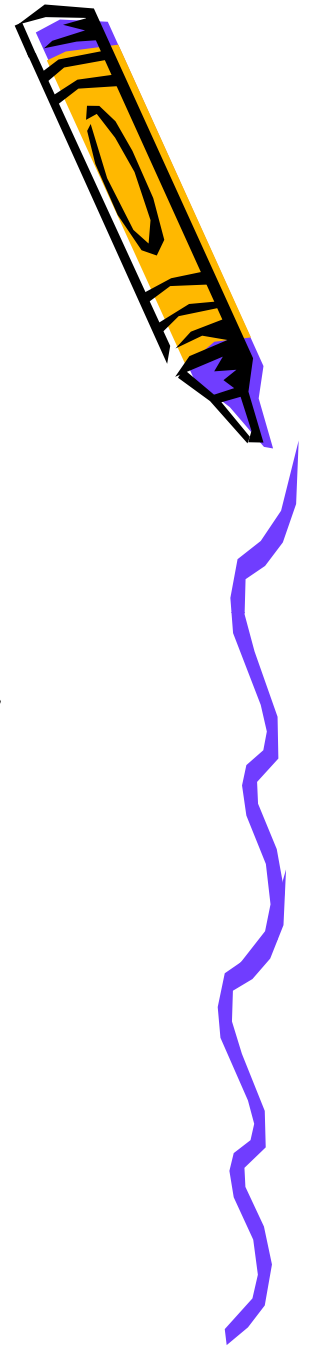
Evaluation

- Urinary Peptide Test: will detect high levels of peptides in the urine
- 50% of people with autism appear to have elevated levels of substances with properties similar to opioid peptides in their urine



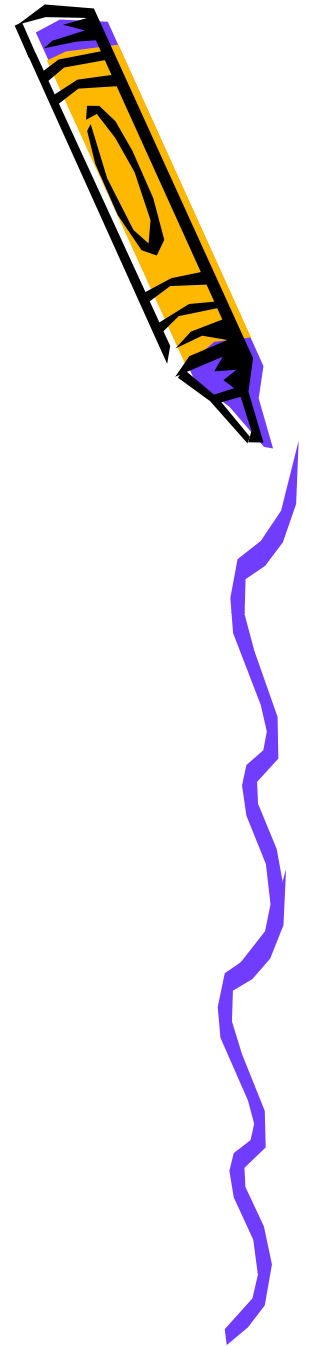
Implementation of Diet

- Attempt for at least 3 months
- Have to omit many things
 - Gluten: soups, sauces, candy, cereals, breads, pastas, cookies, etc
 - Casein: ALL forms of dairy

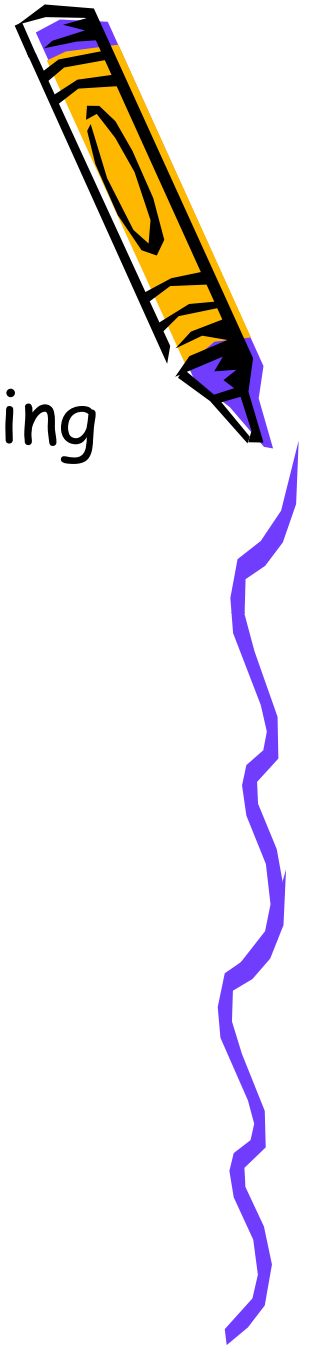


Malnutrition: signs and symptoms

- Fatigue and low energy
- Dizziness
- Poor immune function
- Dry scaly skin
- Swollen and bleeding gums
- Decaying teeth
- Painful joints

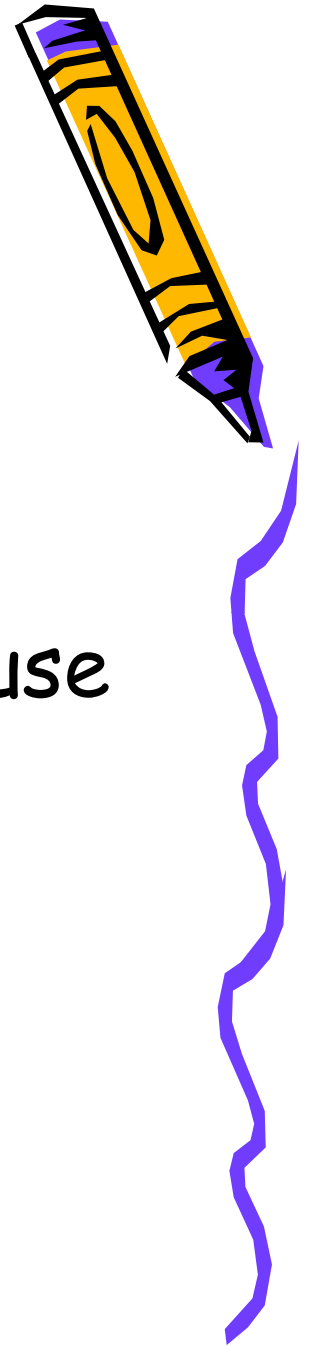


- Slowed reactions times and trouble paying attention
- Underweight
- Poor growth
- Muscle weakness
- Bloated stomach
- Osteoporosis
- Problems with organ function



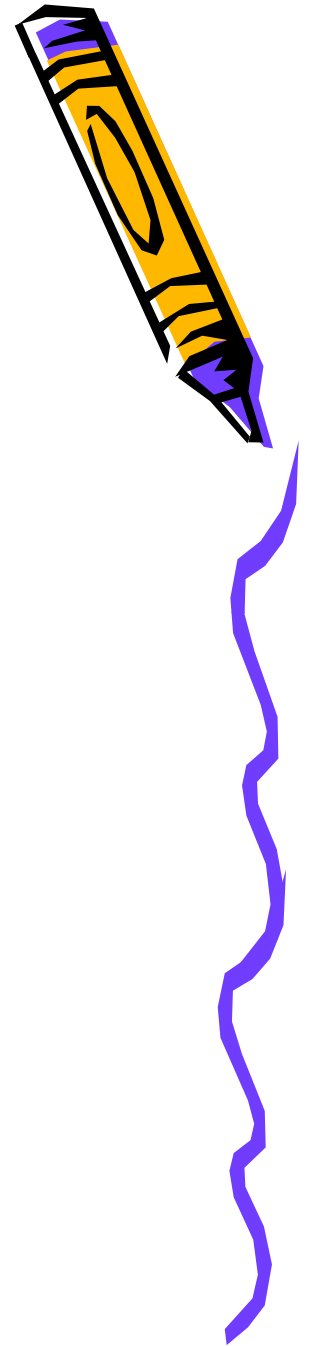
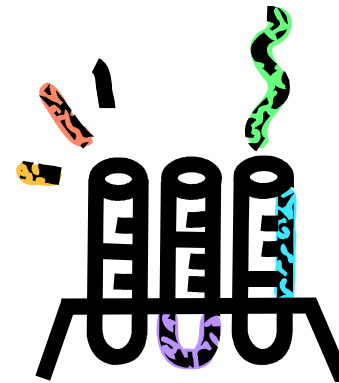
Pregnancy and Malnutrition

- Child may weigh less at birth and have a lower chance of survival
- Vitamin A deficiency is biggest cause of blindness



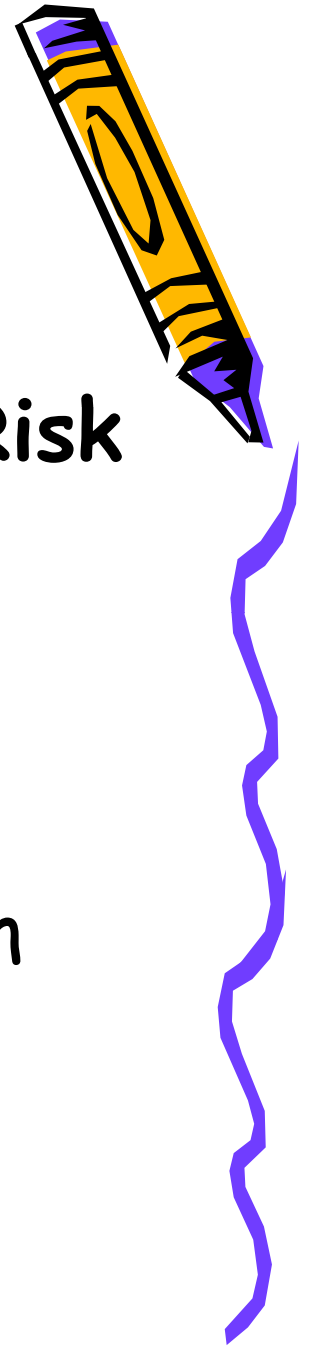
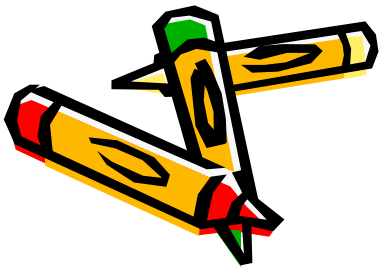
Evidence Based Practice

- Need to make sure what your doing has a good scientific basis
- Two approaches:
 - Standard
 - Non-standard



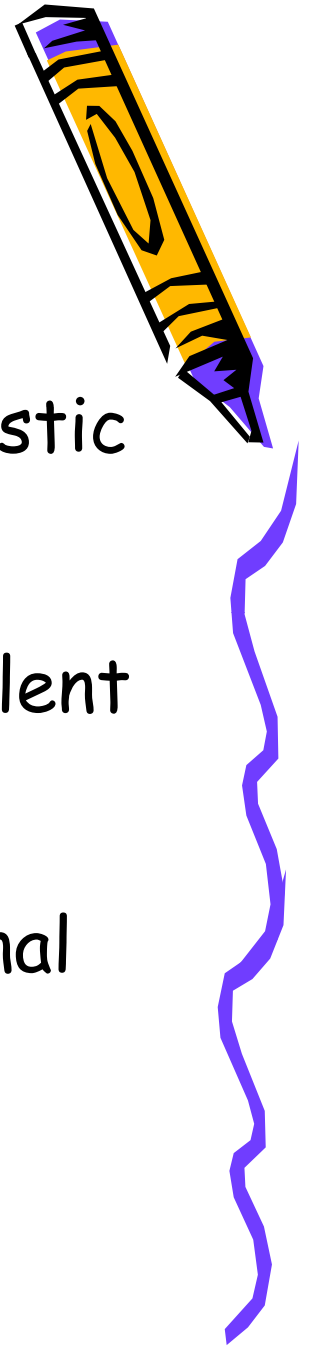
Evidence Based Practice

- "A Kindergarten Cardiovascular Risk Surveillance Study: CARDIAC-Kinder."
- "Childhood Obesity and Attention Deficit/Hyperactivity Disorder"
- "Effect of Dietary Intervention on Autistic Behavior"



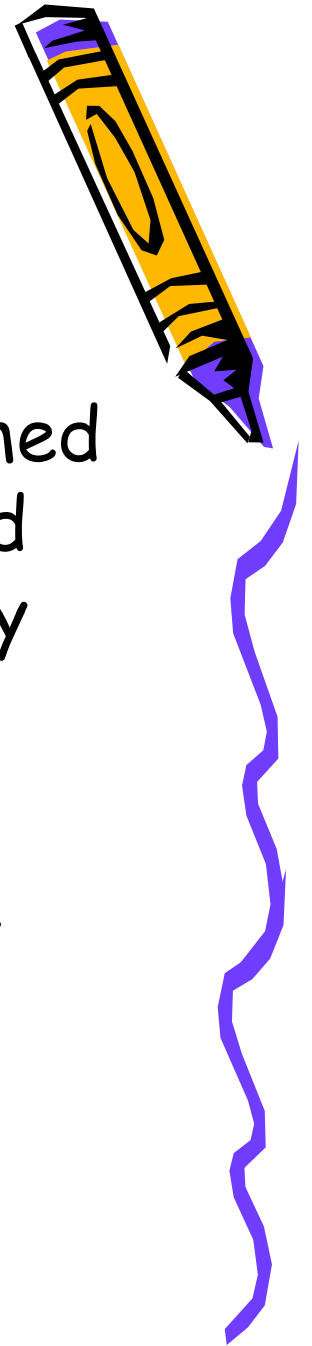
EBP Con't

- "Gluten and Casein Free Diets for Autistic Spectrum Disorder"
- "Childhood Obesity: Costs, Treatment Patterns, Disparities in Care, and Prevalent Medical Conditions."
- "Plasma Amino Acid Profiles in Children with Autism: Potential Risk of Nutritional Deficiencies."

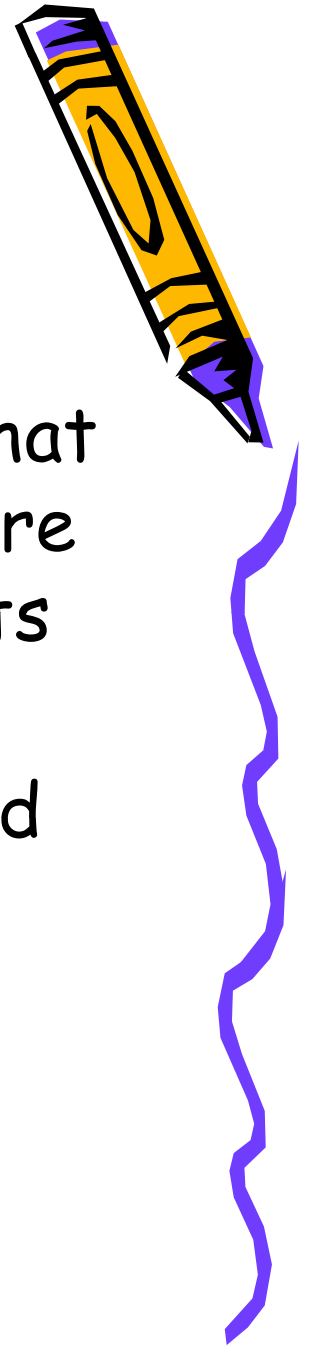


"A Kindergarten Cardiovascular..

- Purpose: to evaluate an intervention aimed at increased family physical activity and parent education about diet and activity for kindergarten students and issues related to their BMI
- Method: parental report of child's diet, physical activity, and step-logs over 4 week period

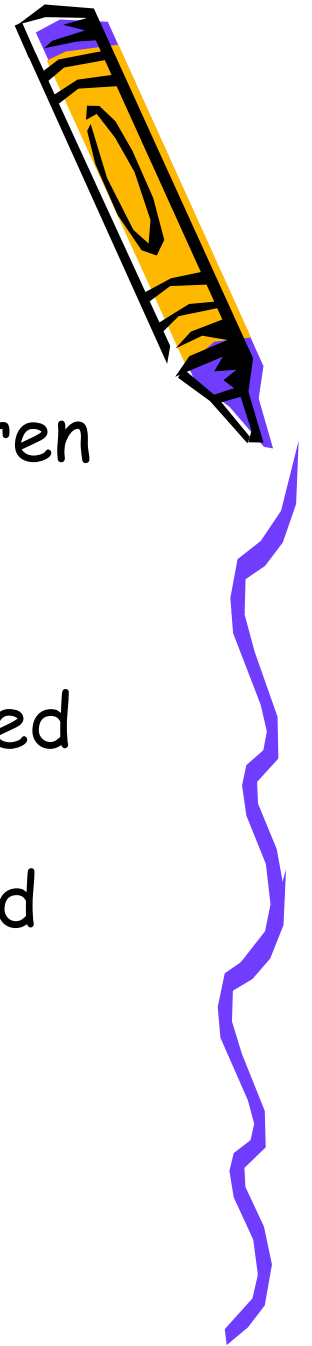


- Results: Intervention group reported that their children obtained more steps, were more active, and consumed fewer sweets than control group]
- Conclusion: Intervention for parents and their young children does produce awareness and activity change

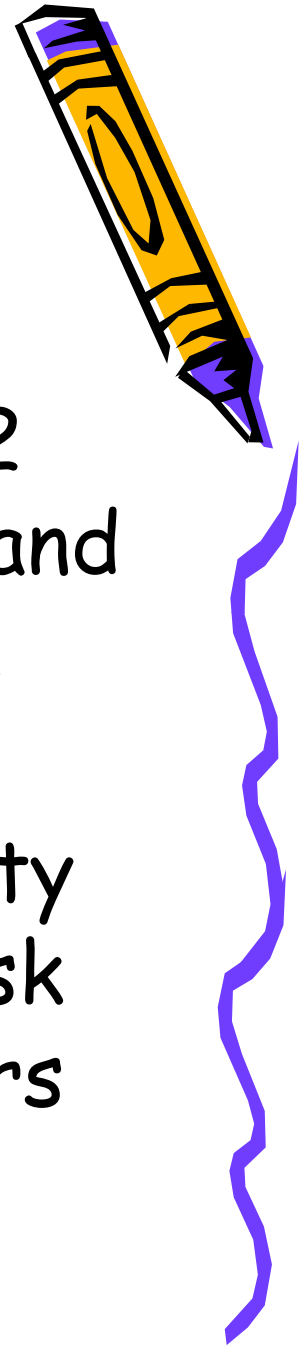


"Childhood Obesity and ADHD..."

- Purpose: described a subgroup of children presenting with obesity and comorbid ADHD and assessed a relationship
- Method: School-age children hospitalized for obesity (>85% BMI) underwent extensive evaluations and were assessed for ADHD

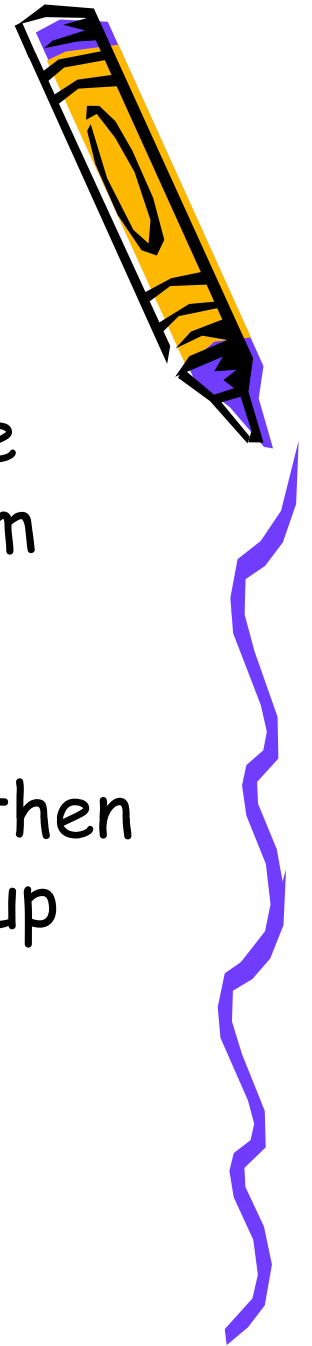
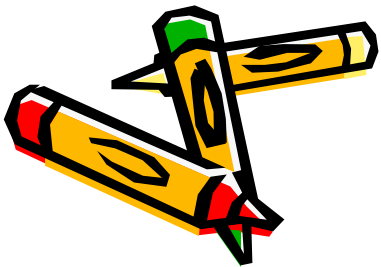


- Results: During a 4-year period, 32 obese children were hospitalized, and 26 were included in the evaluation. 57.7% suffered from ADHD.
- Discussion: Characteristic difficulty of regulation in ADHD may be a risk factor of abnormal eating behaviors

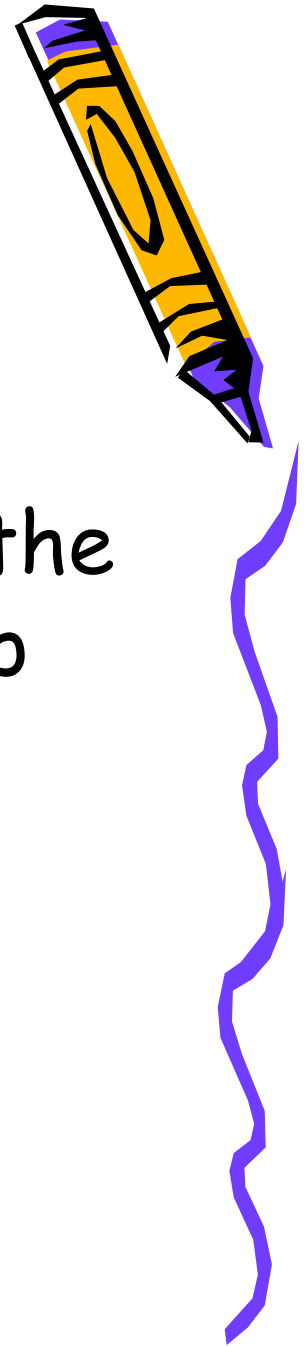


"Effect of Dietary Intervention on Autistic Behavior"

- Purpose: Evaluate effect of gluten-free and casein-free for children with autism and urine peptide abnormalities
- Method: Observations and tests performed on 20 autistic children and then they were assigned an intervention group and control group for one year

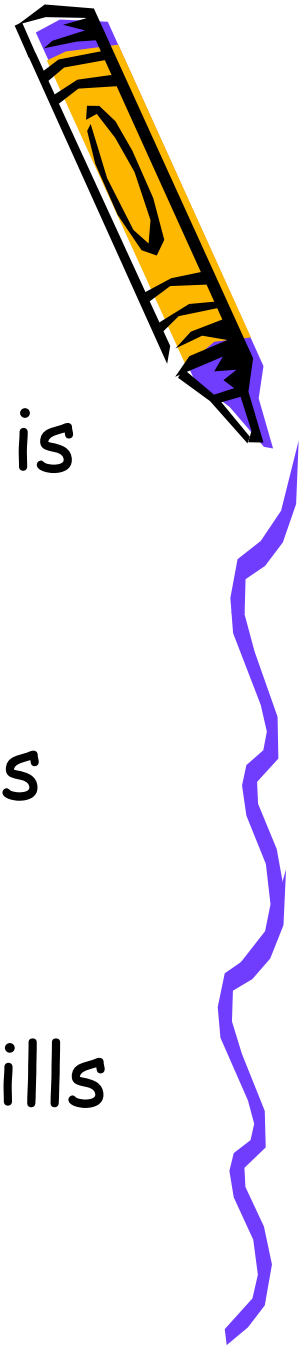


- Results: significant reduction of autistic behavior was observed in the diet group, but not in control group



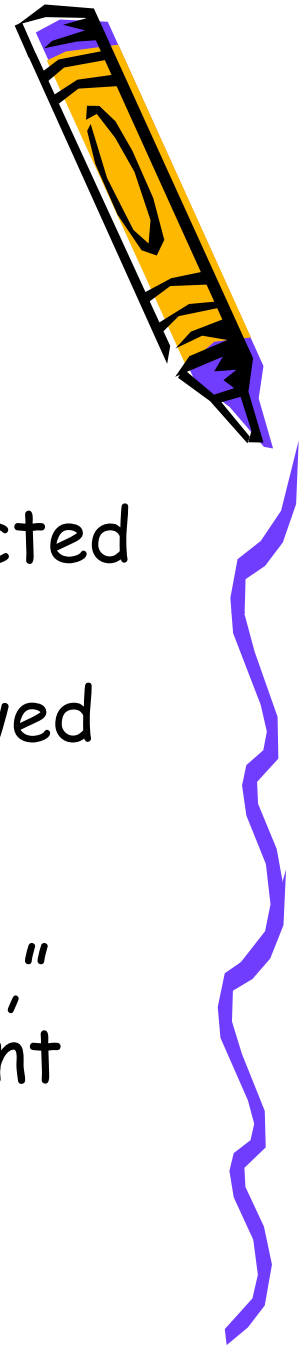
"Gluten and Casein Free Diets..."

- Purpose: To determine if this diet is effective in treating symptoms of autism
- Method: Review of previous studies that have studied this—assessed urinary peptides, behaviors, communication skills, and motor skills

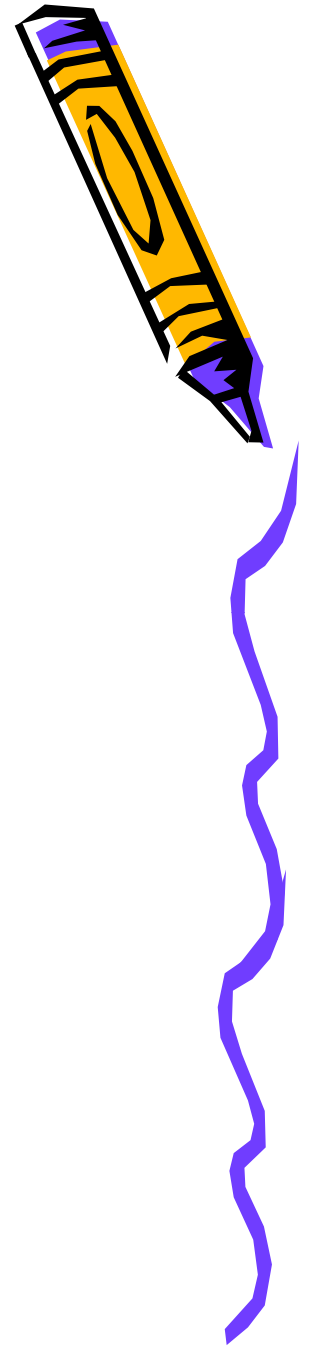


• Results

- Reviewers found only one well-conducted study of the diet
- Testing at the end of the study showed no improvement in learning ability of motor skills
- Only measures of "autistic symptoms," such as stimming, showed improvement

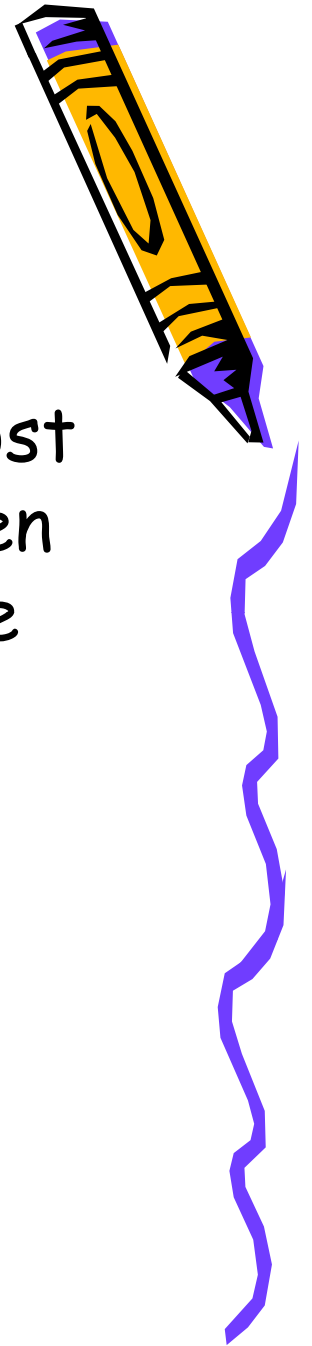


- Results con't
 - Much larger studies are needed to determine if the diet works



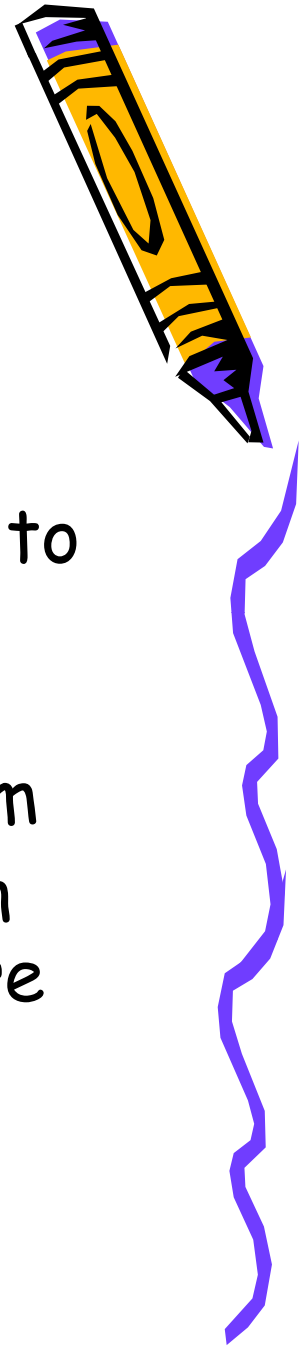
"Childhood Obesity: Costs, Treatment Patterns..."

- Purpose: Investigate the prevalence, cost and treatment of obesity among children covered by Medicaid compared to those covered by private insurance.
- Method: Examined subset of children treated for obesity by use of medical claims for a database of children with private insurance

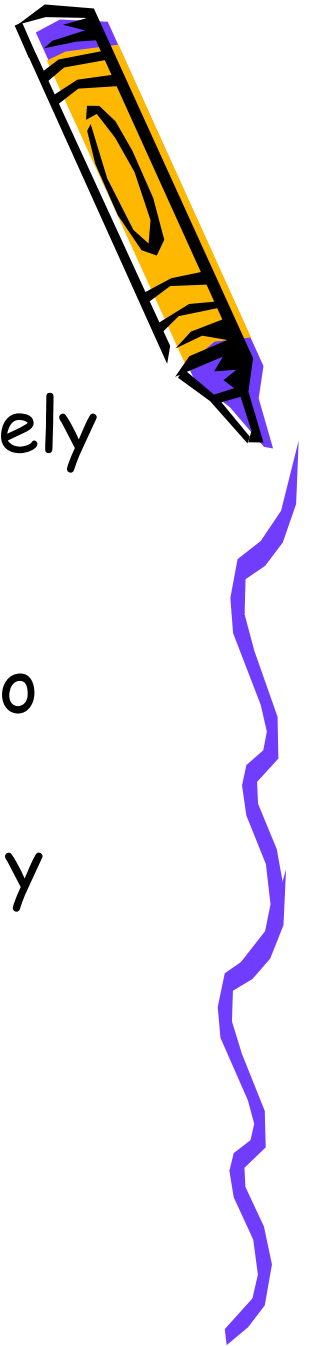


- Key Findings:

- Medicaid children are 6x more likely to be treated for obesity
- Children treated for obesity are 3x more expensive for the health system
- Annual health care costs for children treated for obesity with Medicaid are \$6,700 as opposed to \$3,700

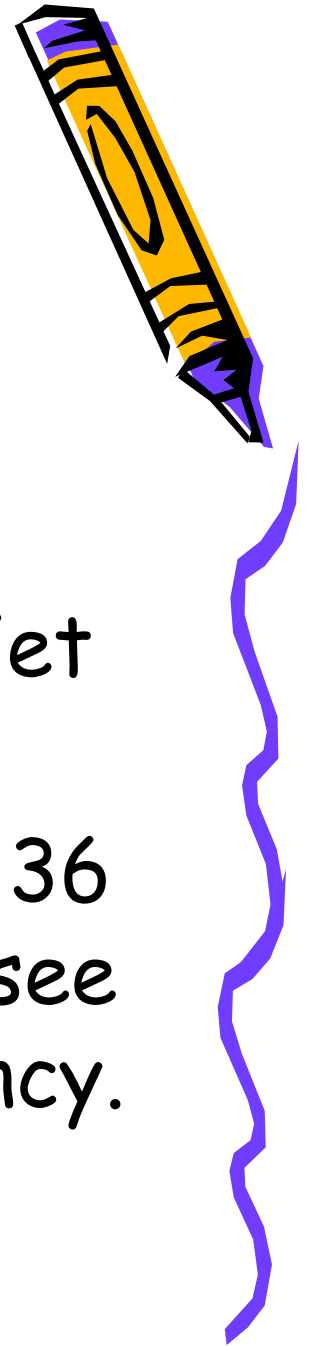


- Children with obesity are 2-3x more likely to be hospitalized
- Children who receive Medicaid are less likely to visit a doctor and more likely to enter a hospital
- Children with obesity are far more likely to be diagnosed with mental health disorders or bone and joint disorders

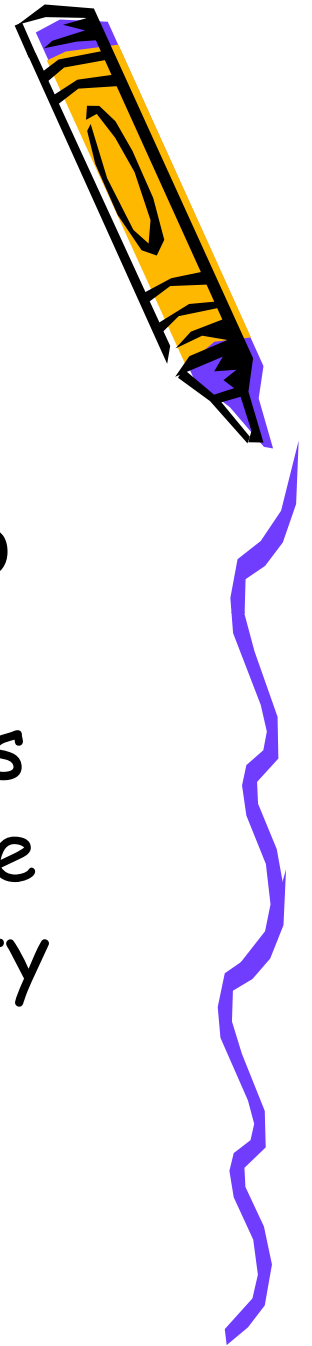


"Plasma Amino Acids Profiles in Children...

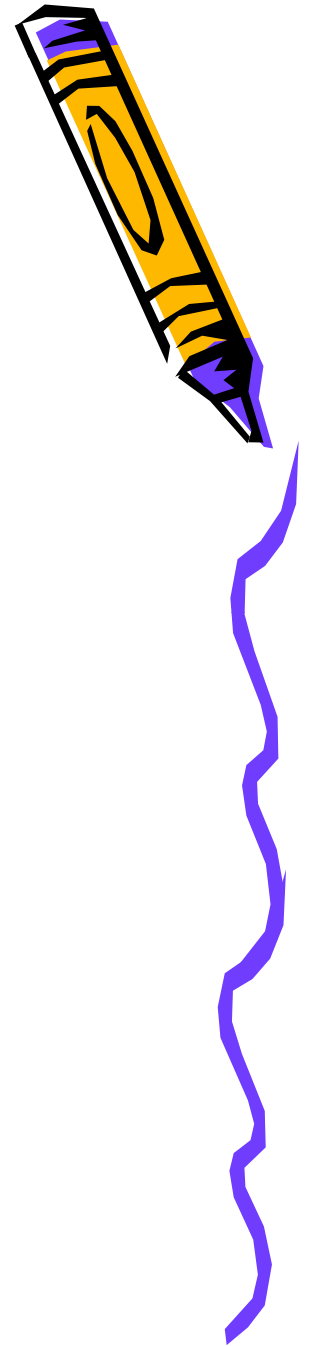
- Purpose: To determine if children with autism who are on an unrestricted diet or gluten free diet have amino acid deficiencies.
- Method: Examination of charts of 36 children. Compared blood work to see if there was an amino acid deficiency.



- Results: Both groups of autistic children had some degree of amino acid deficiency. Control group only had one child with deficiency. Thus neither group was getting adequate nutrition—may be due to selectivity of food.

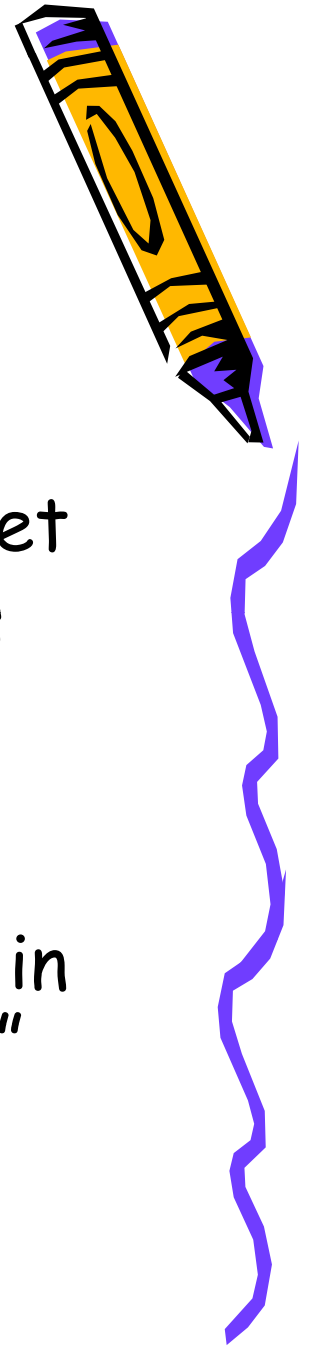


Any Questions?



Resources

- www.carin-site.com
- www.mynchen.demon.co.uk/ketogenic diet
- BBB Autism Support Network: "Parents and Professionals "Why does this diet work."
- Thomson Medstat: "Childhood Obesity: Costs, Treatment Patterns, Disparities in Care, and Prevalent Medical Conditions."



- Childhood Overweight: "What the Research Tells Us."

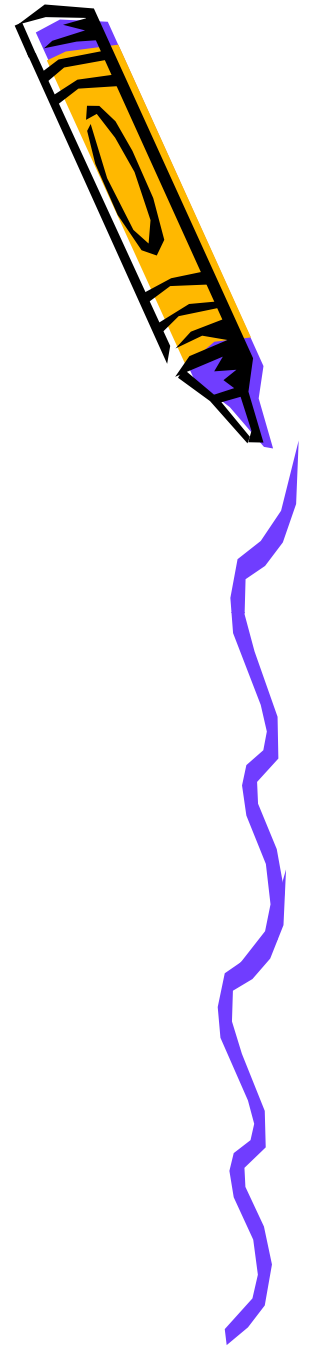
- www.vegsoc.org

- www.kidshealth.org

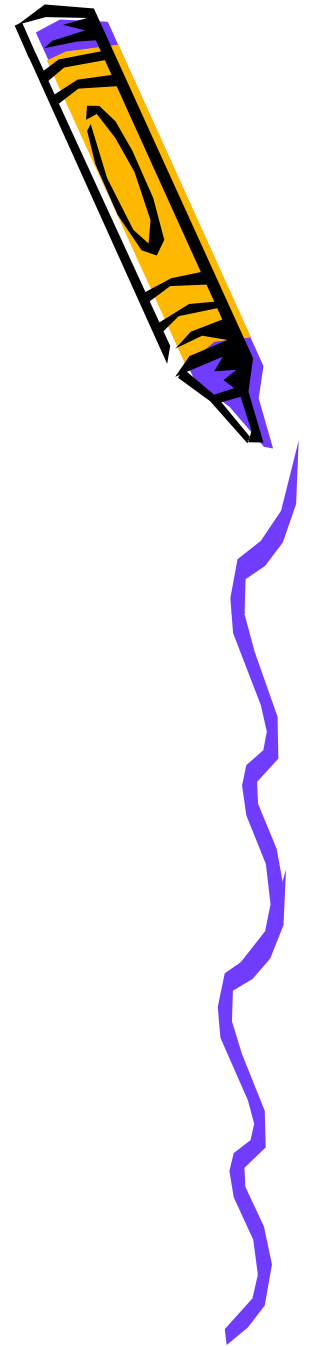
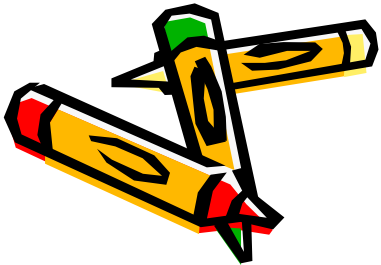
- www.glutensolutions.com

- www.glutenfree.com

- www.autismweb.com



- www.autism-society.org
- www.betterhealthusa.com
- www.autismtoday.com
- www.autism.org
- www.obesity.org
- www.americanheart.org
- www.medsch.ucla.edu



- www.aafp.org
- www.healthychild.net

