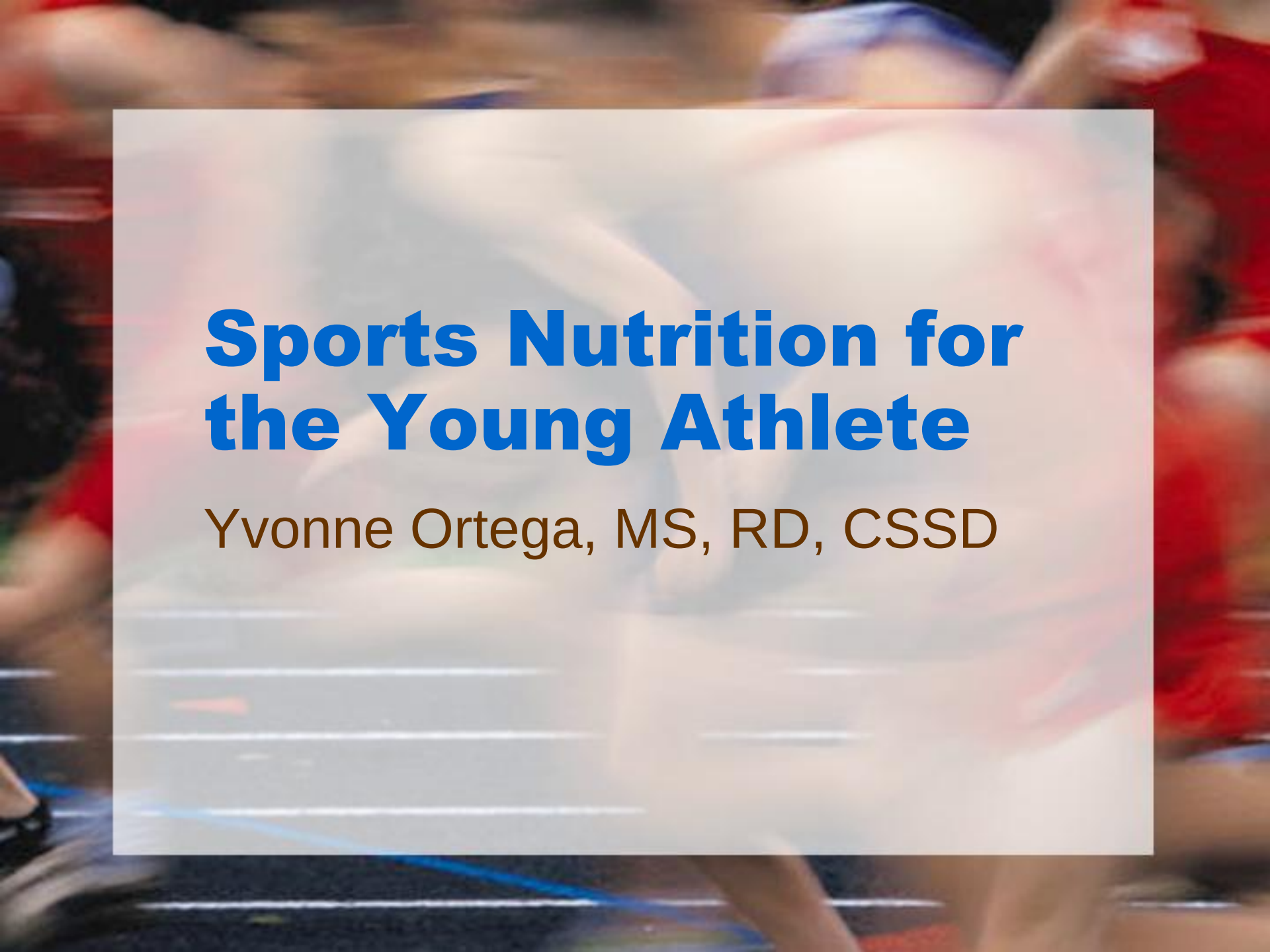
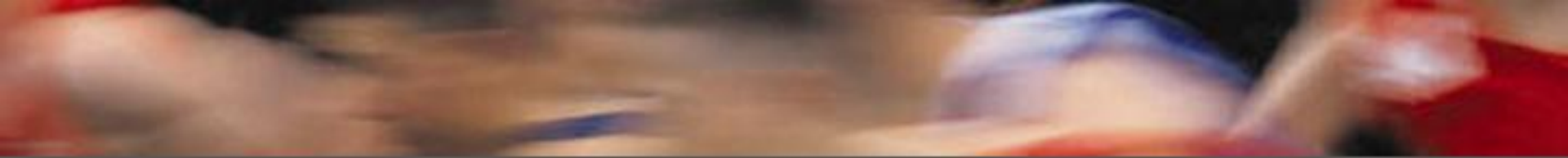


The background of the slide is a blurred photograph of a track and field race. Several athletes are visible, wearing various colored uniforms (red, blue, white). They are in motion on a running track, with their legs and arms blurred due to the speed. The overall scene is dynamic and energetic.

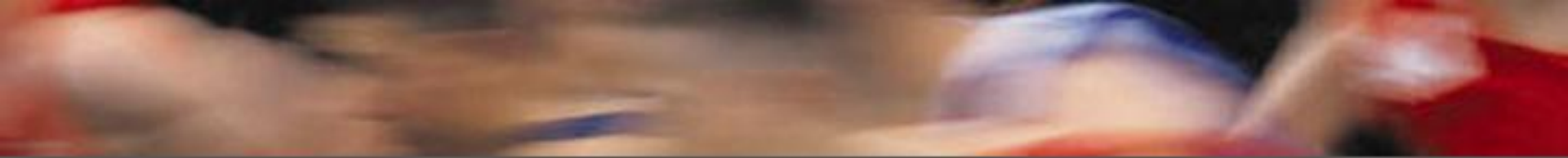
Sports Nutrition for the Young Athlete

Yvonne Ortega, MS, RD, CSSD



Disclosure

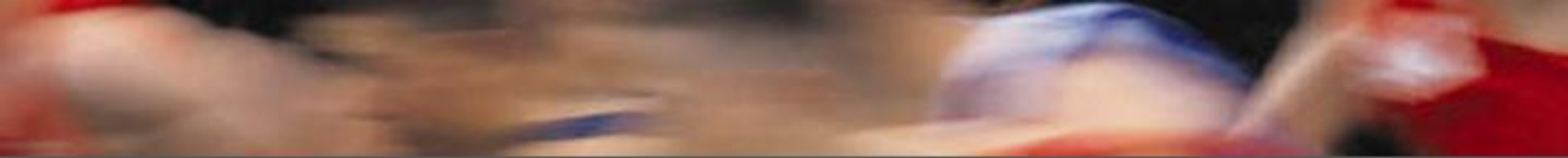
- Neither I nor any member of my immediate family has a financial relationship or interest (currently or within the past 12 months) with any proprietary entity producing health care goods or services consumed by, or used on, patients related to the content of this CME activity.
- I do not intend to discuss an unapproved/investigative use of a commercial product/device.



Objectives of this Presentation

Participants will:

1. Understand how to **assess growth** patterns in young athletes
2. Identify **nutrient needs** of the young athlete
3. Assist in recommendation/referral to a Registered Dietitian specializing in Sports Dietetics or Pediatric Nutrition.



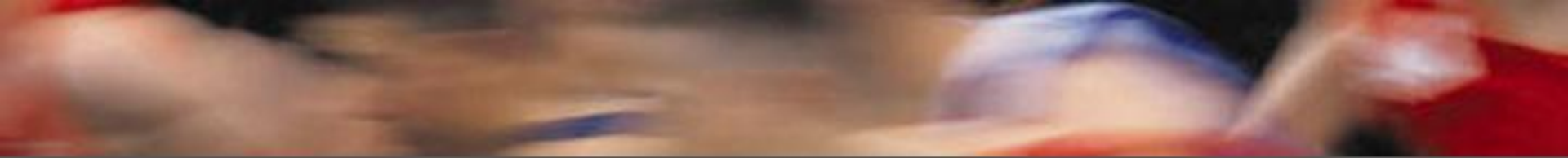
Factors that Affect Athletic Performance

Primary Factors That Affect Athletic Performance

- ✓ Genetics
- ✓ Training
- ✓ Nutrition

Nutrition can allow the athlete to:

- ☐ Maintain appropriate body weight & composition
- ☐ Train harder and maximize performance
- ☐ Delay fatigue
- ☐ Recover faster



Striving for the competitive edge...potential concerns

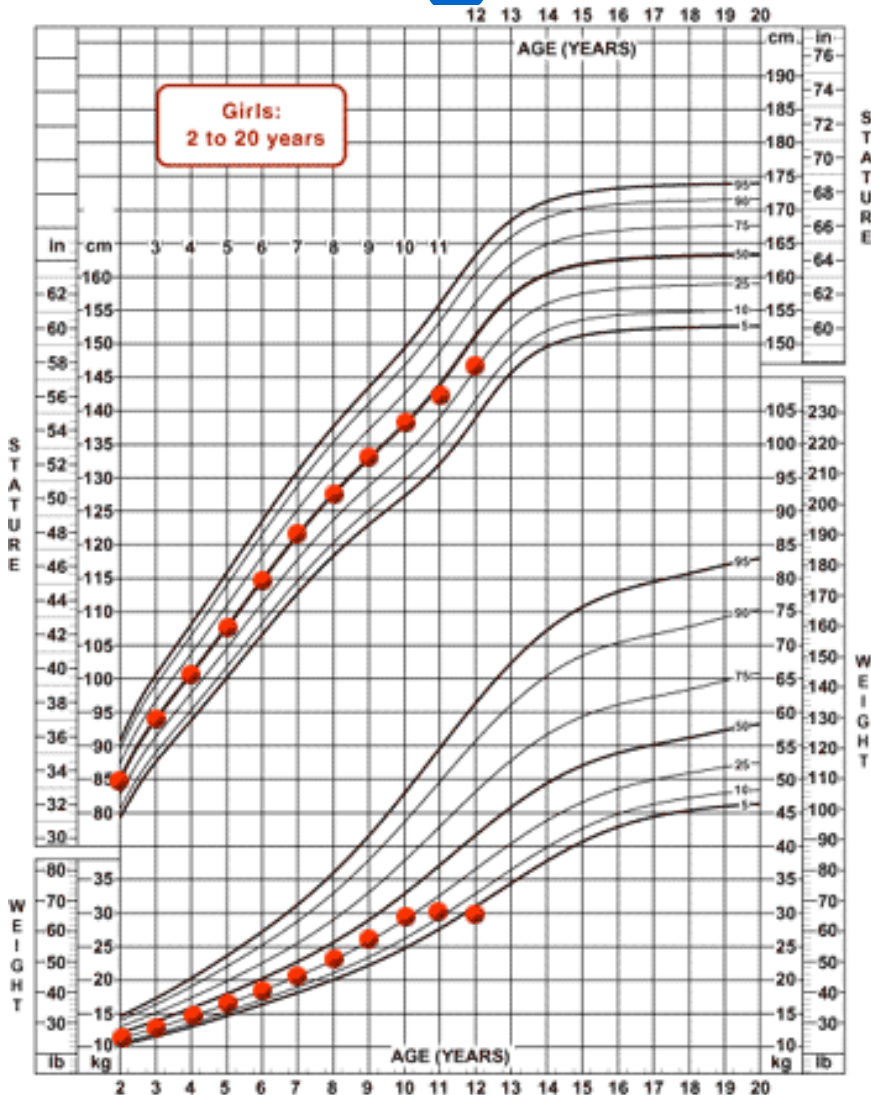
- Misinformation
- Marketing by Supplement Manufacturers
- Unhealthy Eating Behaviors
- Dangerous Methods to Control Weight

Screening and Assessment

- Increased energy demands for adolescents
 - Assess physical growth
 - Height/weight measurements
 - The CDC growth charts can be used to identify the effects of subtle changes in diet that are not visually apparent in day-to-day living.



Weight and Height for Age



Mandy is a 12 year old female who has been a ballet dancer since age 6.

Weight: 66 lbs (3rd percentile) and is 58 inches tall (25th percentile).

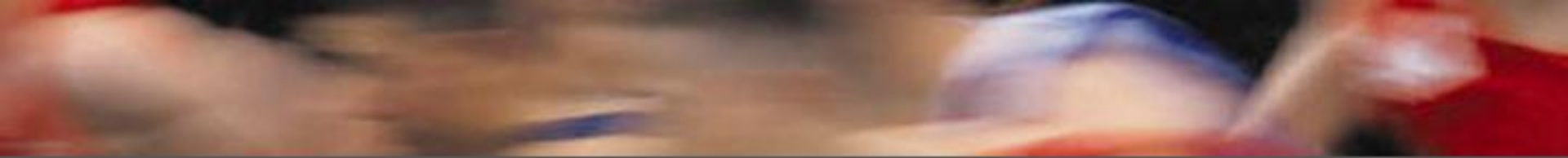
BMI: 13.8 (< 3rd percentile for age).

No evidence of breast or pubic hair development, and expresses no interest in "growing up" because she does not want to "get fat."

Diet: low-fat diet

Mother: 175 pounds at 64 inches tall.

Father: 70 inch tall; competitive runner, who is a self-described "fitness fanatic."

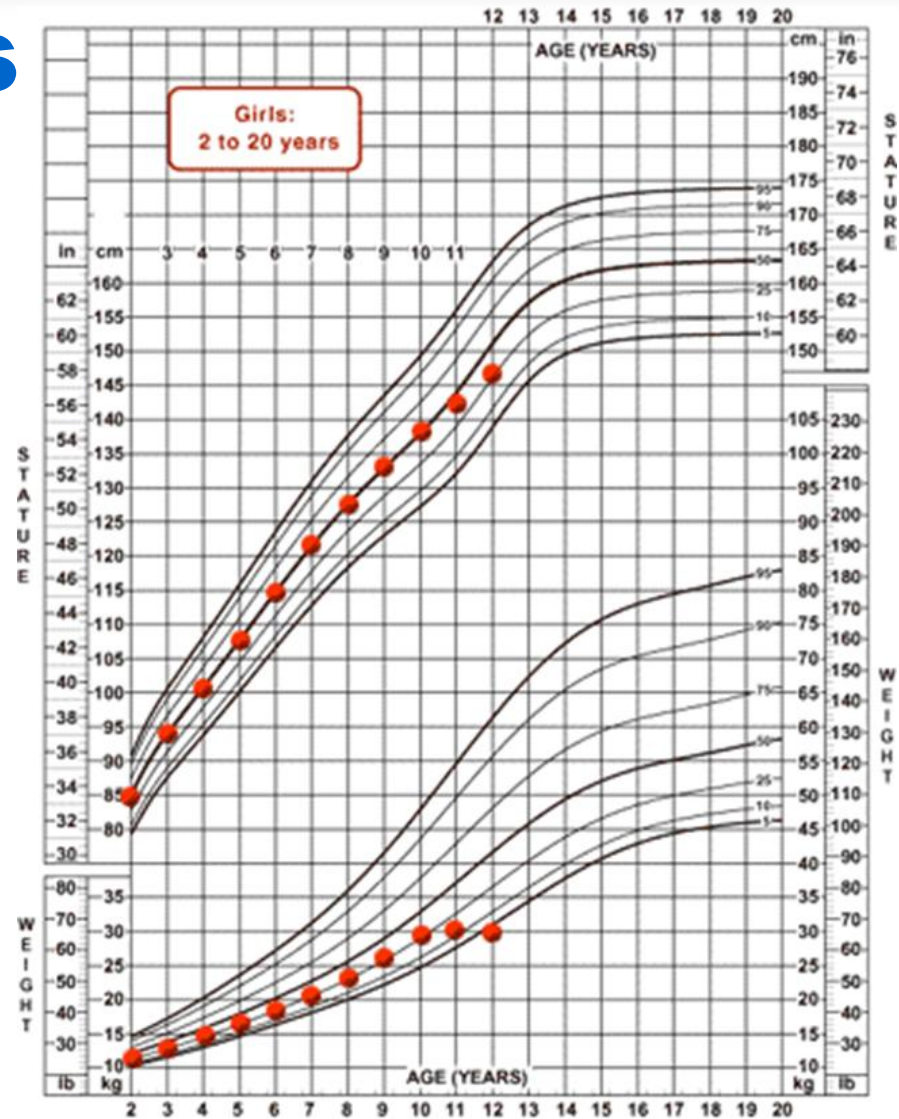


Pre-pubertal Adolescent

- Mandy has not yet reached her adult stature
 - she has not yet begun puberty
 - has not gone through her growth spurt
 - **Genetic potential** with respect to stature can be estimated from her **mid-parental height formula**:
$$\text{Father's stature} + \text{Mother's stature} - 5 / 2$$
- In Mandy's case, that would be $(70 + 64 - 5) / 2 = 64.5$ inches for her expected adult stature.

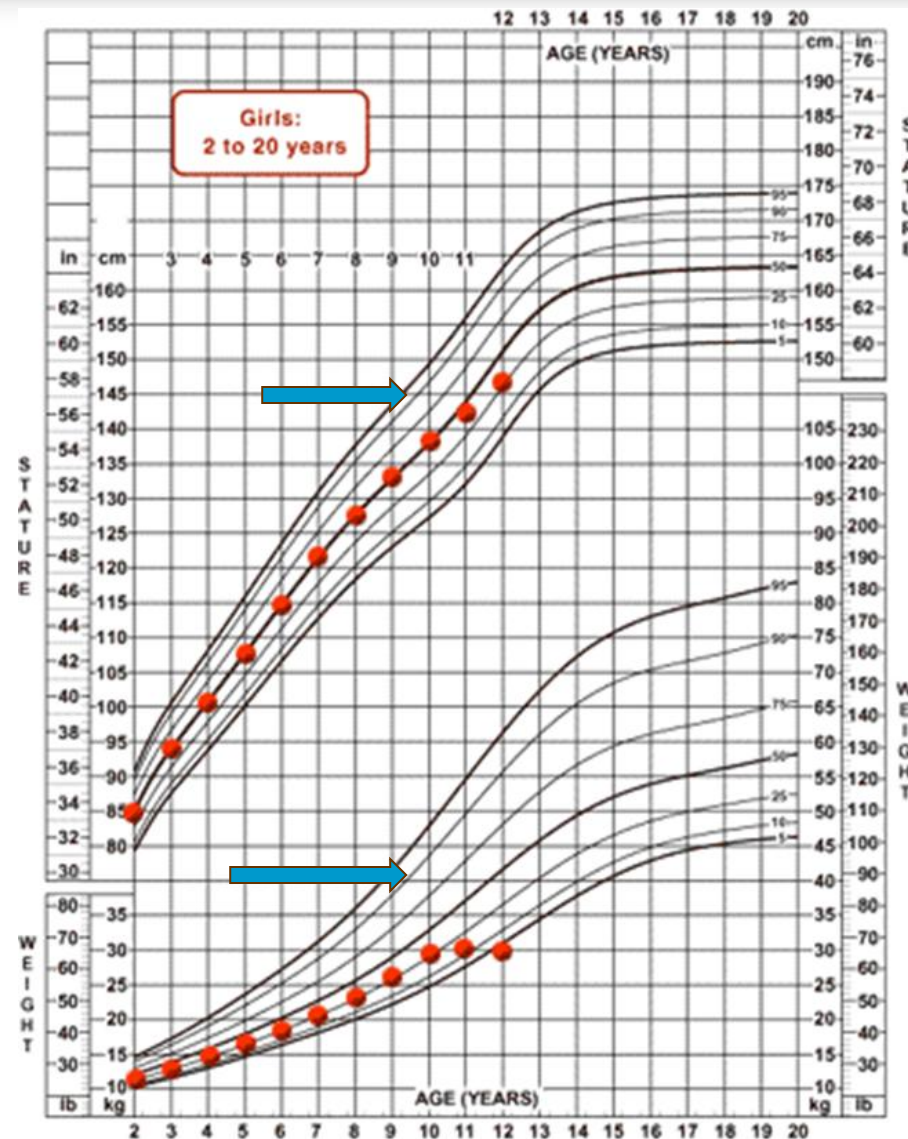
Other Concerns

- If she were to continue to grow along the **25th percentile**, her final adult stature would be **62.5 inches**, 2 inches less than otherwise expected.



Mandy's fall in weight and stature-for-age indicate:

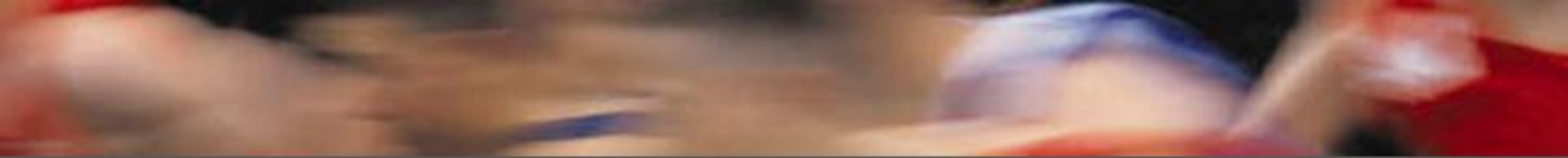
- her **growth has slowed** more than expected
- could possibly be due to **inadequate caloric intake** relative to **increased energy needs** during puberty.



Caloric Intake

- Must consume enough for **growth** and **activity**
- Average active teenager may require **1500 – 2500** kcals/day
- Macronutrient Distribution:
 - CHO: 55% of kcals
 - Protein: 12-15% of kcals
 - Fat: 25-30% of kcals



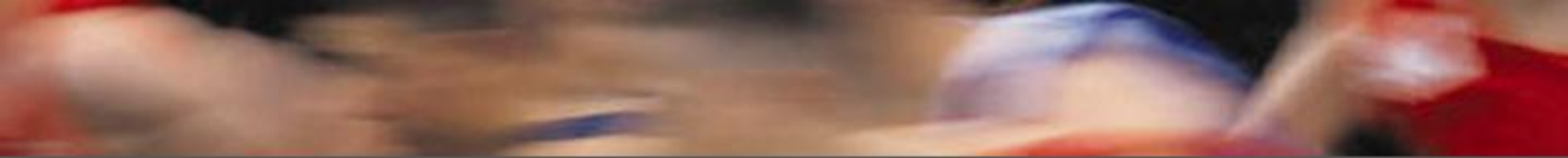


Dietary Assessment

- Ensure **glycogen storage** with CHO
- Protein for **growth**
- Fluids to **prevent dehydration**/promote optimal performance
- Adequate, not excessive fat intake
- Variety of fruits/vegetables for **nutrient intake**
- Variety of calcium and Vitamin D for **peak bone mineralization**

Pre Event Meal Patterns for Athletes

Meal/Snack Pattern for Athletes		
Meal/Snack	Timing	Examples
<i>Snack</i> 15-20 grams CHO <5% Fat	½ - 1 hour before	Pretzels and fluids
<i>Light Meal</i> 30-40 grams CHO 5-15% fat	2-4 hours before	Turkey sandwich Fruit Fluids
<i>Heavy Meal</i> 50-60 grams CHO 15-25% fat	4-5 hours	Baked chicken Potatoes Fruit Bread Lemonade

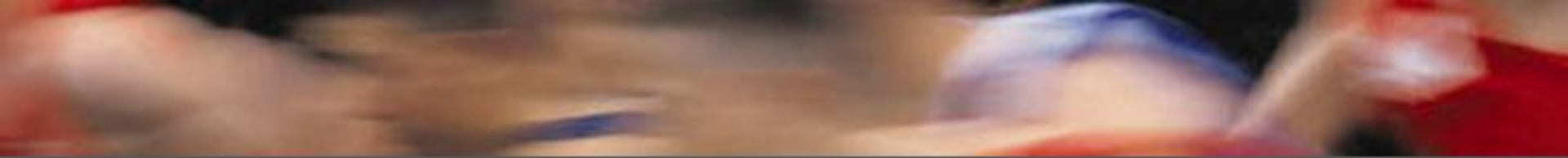


Post Event Nutrition

- Post event – muscles are receptive to store glycogen the first 2-3 hours
 - Eat **immediately after** exercise/competition
 - Again at **2 hour intervals**
 - Optimize glycogen in the muscles – **glycogen synthesis** rate is best
 - Protein intake will **enhance muscle uptake** and retention of amino acids for recovery
 - Vitamins/Minerals to **boost immune** system

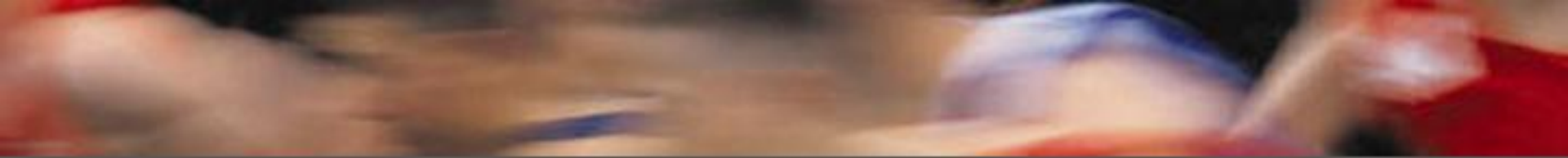
Post Event Nutrition

Meal/Snack	Timing	Examples
CHO: 1-1.2 g/kg Protein: 15-20 g Fluids: 500-750 mL for every 0.5 kg lost	Within 30 minutes to 1 hour post exercise	100% fruit juice Bagel Muffin Crackers Energy bars Chocolate Milk Fluids
High CHO Protein Fat Fluids	2 hours later	Well balanced meal Lean proteins Grains Fruit/Vegetables Fluids



Protein Intake

- Recommendations:
 - Adolescents: 0.9 g/kg
 - Athletes beginning training: 1.0-1.5 g/kg
 - Endurance Athletes: 1.5 g/kg
 - Average U.S. Adolescent Diet: 1.3 g/kg
 - Never above 1.5 g/kg



Side Effects of Too Much Protein

- Whether from food or supplements:
 - Dehydration
 - Weight Gain
 - Increase Calcium loss from the body
 - Does not allow for complete replacement of muscle glycogen

WHAT COMES ALONG WITH YOUR PROTEIN?

	Porterhouse steak(6 oz)	Salmon Fillet(6 oz)	Cooked Lentils (1 cup)
Protein	38g	34g	18g
Fat	44g (16g SF)	18g (4g SF)	<1g
Calories	560	350	230

Food Choices

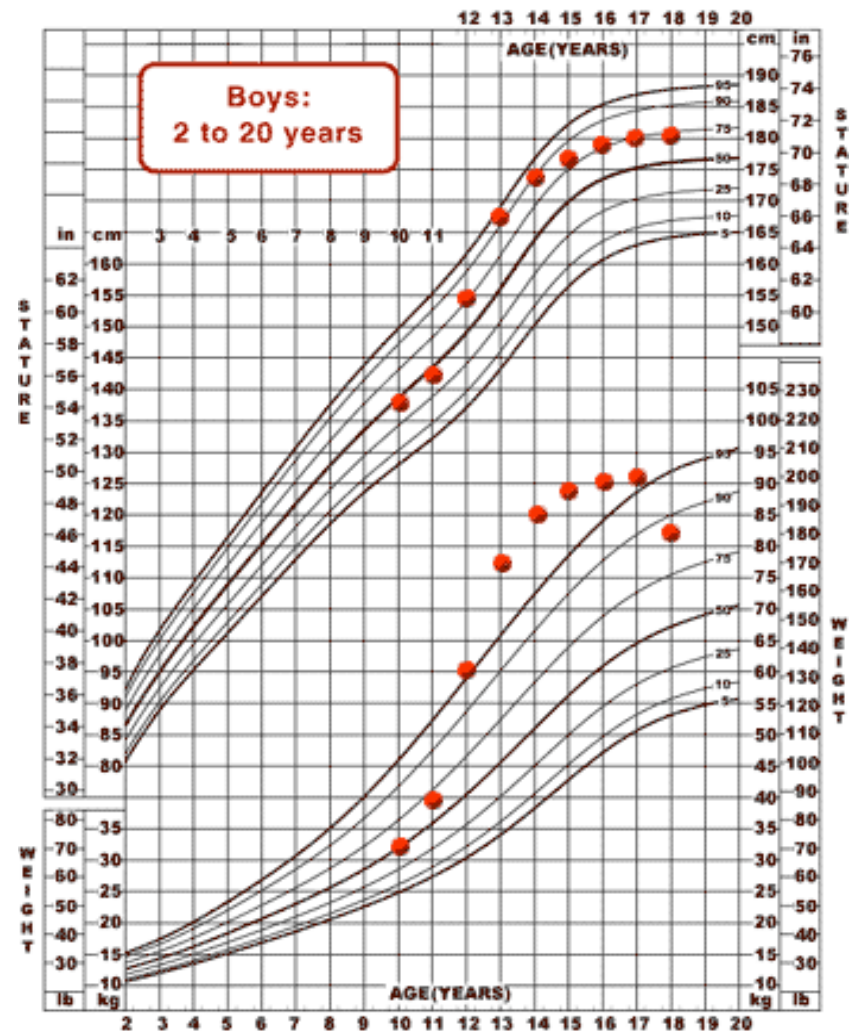
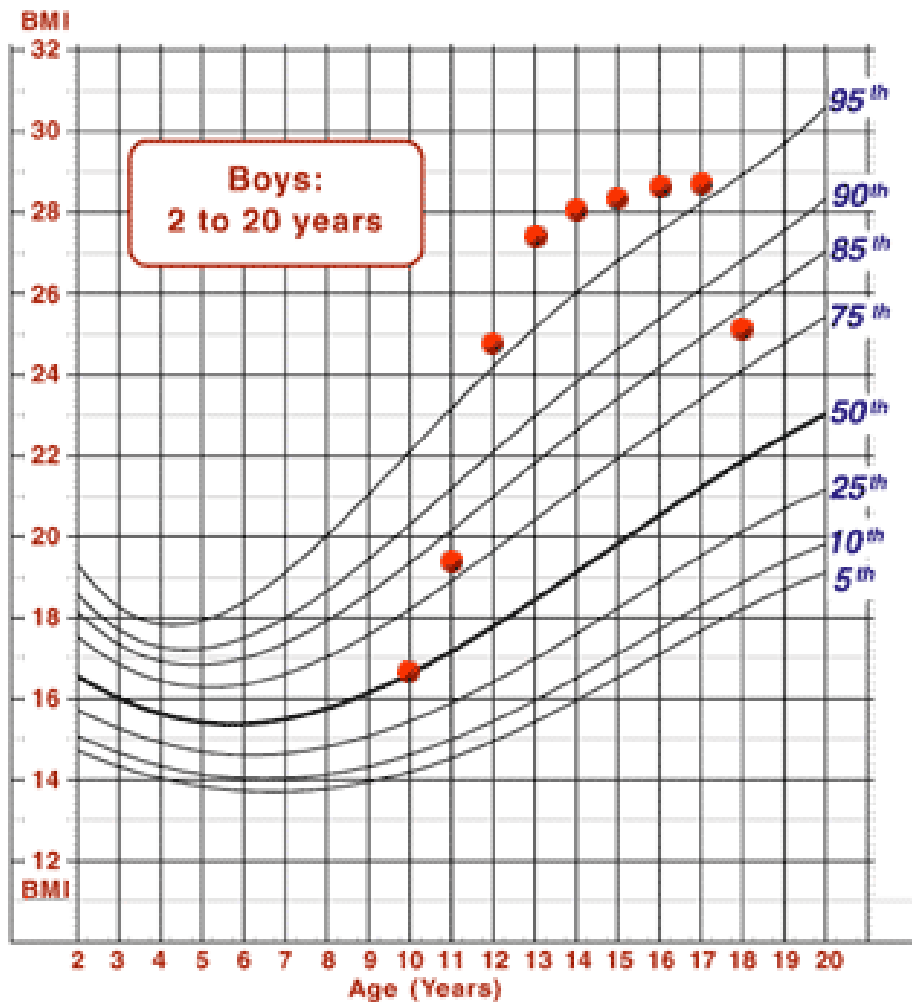
- It is important to keep in mind the client's food preferences which may be determined by:

- Taste
- Cultural Heritage
- Religious Beliefs
- Philosophical Beliefs
- Budget

Time	Place	Activity or food eaten	People present	Mood
10:30-10:40	School vending machine	6 peanut butter crackers and 1/2 oz. cola	by myself	Starved
12:15-12:30	Restaurant	Sub sandwich and 1/2 oz. cola	friends	relaxed & friendly
3:00-3:45	Gym	Weight training	work out partner	tired
4:00-4:10	Snack bar	Small frozen yogurt	by myself	OK

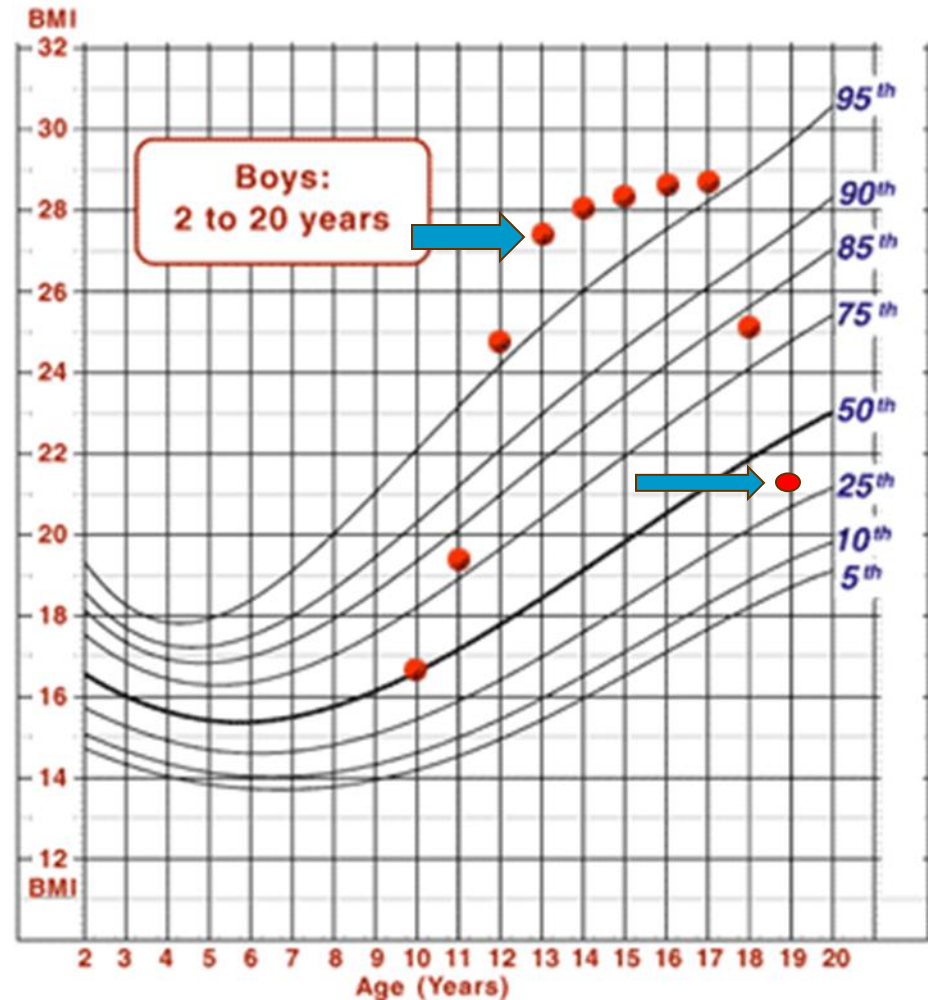
- These can be determined by a food diary

Don – Freshman Crew Team



What's wrong with this picture?

- Don's goal of weighing 155 lbs at 71 inches would result in a **BMI of 21.6**. This would be a "healthier" BMI than he had at 13 years of age (170 lbs and 66 inches: BMI 27.5)



BMI vs. Body Composition

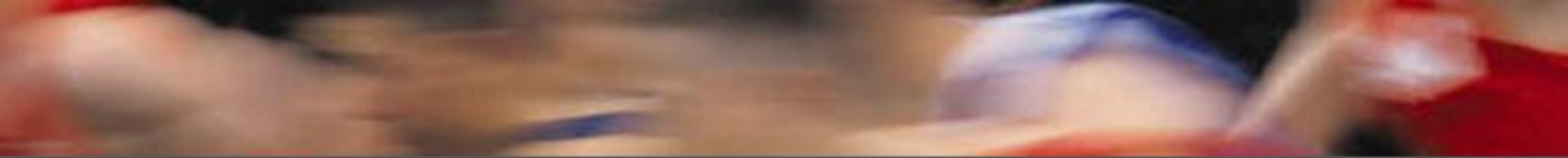
- Physical examination, adolescents whose high BMI is due to **extreme muscularity** rather than excessive fat tissue.
 - **triceps skinfold** thickness
- Possible for adolescent athletes to have a **high BMI-for-age** and a **low body fat**, especially if they are using anabolic steroids.



Top 5 Sports Nutrition Myths

1. Supplements are necessary to provide the competitive edge
2. Protein, in excess, can help build muscle
3. Unhealthy weight loss/gain strategies will not effect my health
4. Carbohydrates will make me “fat”
5. Athletes should avoid all fats





Resources for Sports Nutrition

- Great resource to assist patients:
 - AAP Policy statement: Promotion of Healthy Weight-Control Practices in Young Athletes
<http://pediatrics.aappublications.org/content/97/5/752>
 - Sports, Cardiovascular and Wellness Nutrition (SCAN) <http://www.scandpg.org/>

References

- American Academy of Pediatrics Policy Statement: Promotion of Healthy Weight-Control Practices in Young Athletes
<http://pediatrics.aappublications.org/content/97/5/752>
- *The Pediatric Nutrition Handbook*, Sports Nutrition chapter by Bonnie Spear
- U.S. Department of Health and Human Services, Maternal and Child Health Bureau Growth Module
- Optimal Dietary Intake by the U.S. Anti-Doping Agency
<http://www.usada.org/diet/>
- Irene Pace, BSc, RD, Nutrition for Athletes presentation
- Lair, Cynthia, Feeding the Young Athlete, Readers to Eaters, 2012.
- Team USA.org <http://www.teamusa.org/About-the-USOC/Athlete-Development/Sport-Performance/Nutrition/Resources-and-Fact-Sheets.aspx>