

## Applied Exercise and Sport Physiology, with Labs, 4e

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### Chapter 18 – Study Guide Answers

Why is it important to be able to recognize the onset of puberty?

Normal growth patterns and responses to exercise training are substantially different in children than in adolescents

How do you use height and body weight data to identify the adolescent growth spurt?

Examine the yearly change in height or body weight as a function of age

Dramatic increases in height and body weight coincide with the onset of puberty

Increases change from around 5 cm per year to 10 cm per year for height and 3 kg per year to 10 kg per year for weight

What effect does exercise have on normal growth and development patterns of children?

None. It does not appear to either accelerate or decelerate growth and maturation. It does not affect height, weight, body build, or biological maturation.

What effect does exercise have on body composition in children and adolescents?

Results in lower levels of percent body fat and fat weight and produces more fat-free weight

Describe the normal developmental patterns of absolute  $\text{VO}_2$  max during childhood and adolescence for males.

- **childhood:** increases throughout
- **adolescence:** continues to increase

Describe the normal developmental patterns of absolute  $\text{VO}_2$  max during childhood and adolescence for females.

- **childhood:** increases throughout
- **adolescence:** levels off at about age 14

What accounts for the increase of  $\text{VO}_2$  max during childhood?

It is a function of growth in the lungs, circulatory system, and musculature.

Why is making weight a bad idea for adolescent athletes?

Attempts to make weight often involve drastic changes in caloric intake and water metabolism, which can cause changes in kidney and cardiovascular function.

What are some hazards associated with long-distance running for children?

- Heel cord injuries
- Epiphyseal growth plate injuries

- Chronic joint trauma
- Thermal intolerance
- Psychological problems from unrealistic goals

What metabolic adaptations are associated with anaerobic training in children and adolescents?

- Increased:
  - phosphofructokinase
  - myosin ATPase
  - creatine phosphokinase
  - myokinase
  - stores and rate of utilization of ATP, CP, and glycogen

What factors should you consider when planning an anaerobic training program for children?

- Training program should closely mimic the intended sporting activity with respect to the mode of exercise as well as the metabolic demands.
- Training protocol should include repetitions that tax the appropriate anaerobic system, whether phosphagens or glycolysis.

What are some benefits associated with strength training for prepubescent children?

- Improved flexibility
- Favorable changes in blood lipid profiles
- Enhanced bone and connective tissue development
- Favorable changes in body composition
- Reduced musculoskeletal injuries during sports participation
- Improved motor skills
- Increased muscular endurance
- Positive psychological effects

What are the likely explanations for strength increases in response to resistance training in prepubescent children?

- Primarily neural adaptations
- Possibly hypertrophy

What are some hazards associated with strength training for children and adolescents?

- Acute musculoskeletal injuries such as ruptured disks and damage to the epiphyseal growth plate
- Chronic musculoskeletal injuries such as stress fractures and strains

What effect does exercise have on the menstrual cycle?

Intense training programs can result in amenorrhea and other athletic menstrual cycle irregularities (AMI).

What effect does the menstrual cycle have on athletic performance?

There is no compelling scientific evidence that the menstrual cycle has a general effect on athletic performance. Individual athletes may or may not be affected.

What is the female athlete triad?

Refers to the interrelationships among energy availability, menstrual function, and bone density, which may have clinical manifestations, including disordered eating, amenorrhea, and osteoporosis.

Which sports are associated with the female athlete triad?

- Sports that emphasize low body weight: gymnastics, figure skating, diving, cheerleading.
- Sports that use weight categories: horse racing, martial arts, wrestling, rowing.

What signs of disordered eating should coaches and trainers look for?

Early signs of disordered eating include excessive weight loss and avoidance of food, use of laxatives and diuretics, and vomiting.