

Benefits of Physical Activity in growth and development in Children and Adolescents

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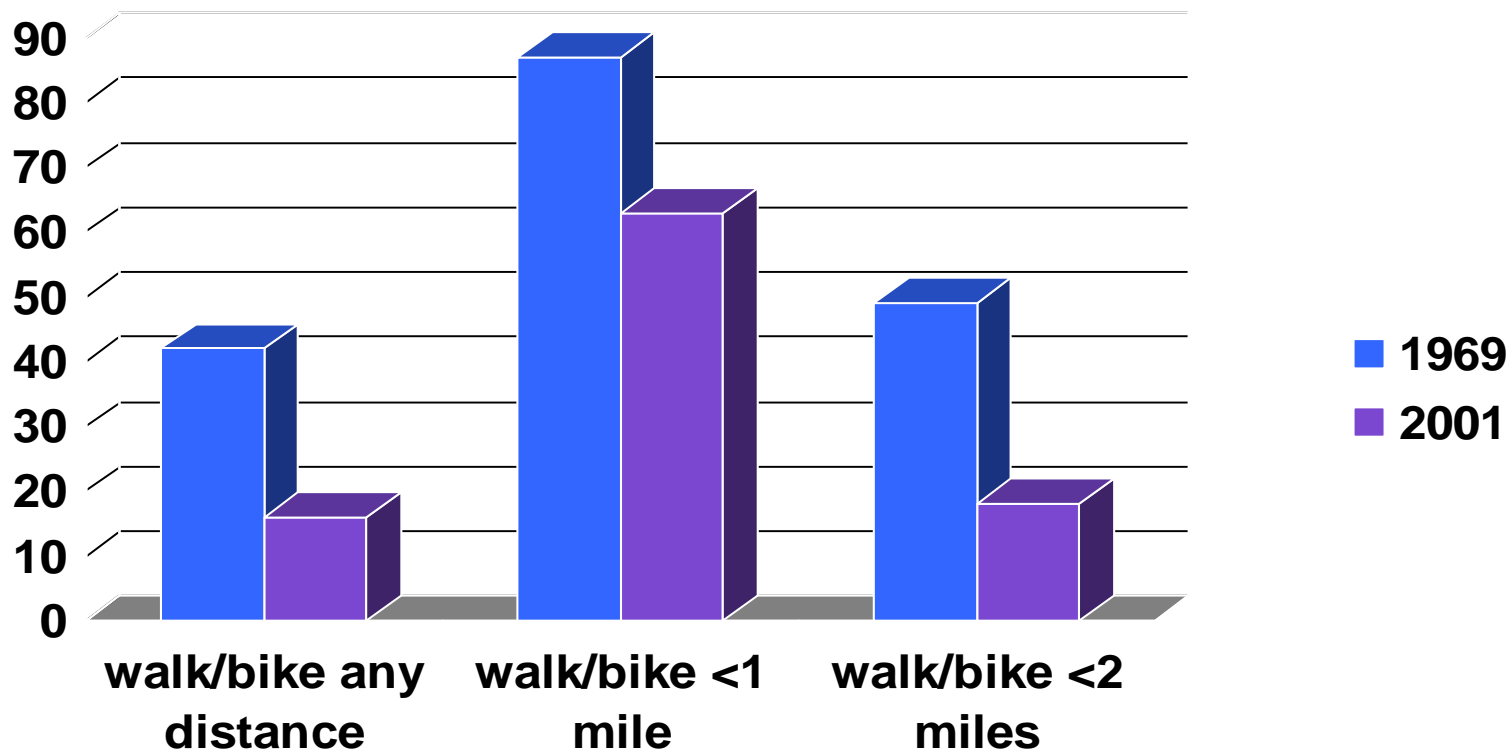
Physical Inactivity Statistics

- 63% of 5-17 y.o. not active enough for optimal growth
- Adolescents less active than children 2-12 years old (33% vs 43%)
- Decline in activity with age and gender (girls at 14-15 yrs vs boys 16-17 yrs)
- Girls less active than boys: 30% vs 50% at 5-12 yrs vs 25% vs 40% at 13-17 yrs
- Girls - less intense physical activities



'Wandering to the fridge and back doesn't officially count as exercise'

Prevalence of Active Commuting to or from School



Source: Am J Prev Med 2007;32(6):509–16.

Health Benefits of Physical Activity: Strong Evidence

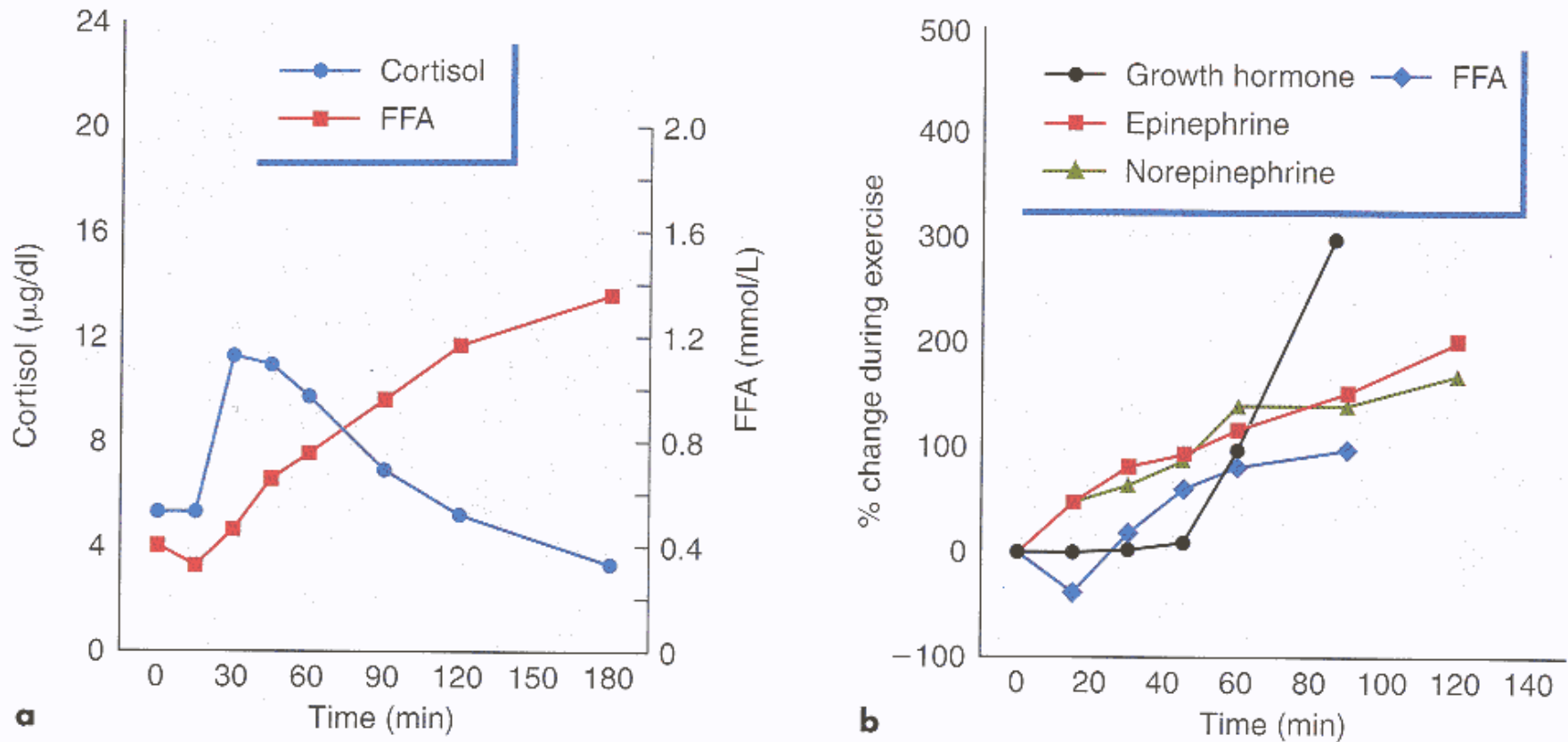
- Promotes health and fitness
- Builds healthy bones and muscles¹
- Reduces the risk of developing obesity and risk factors for diseases such as type 2 diabetes and heart disease¹
- Reduces the symptoms of anxiety and depression¹
- Can positively affect concentration, memory, and classroom behavior²



1. HHS. Physical Activity Guidelines Advisory Committee Report;2008

2. J Pediatr 2005;146(6):732-7.

Growth hormone and exercise



▲ **Figure 5.11** Changes in plasma levels of (a) free fatty acid (FFA) and cortisol and (b) epinephrine, norepinephrine, growth hormone, and FFA during prolonged exercise.

Physical Activity vs. Physical Education¹

- Physical activity = behavior
- Physical education = curricular area that teaches about physical activity
 - Provides students with the skills needed to participate in a lifetime of physical activity



1. National Association for Sport and Physical Education. Understanding The Difference: Is It Physical Education or Physical Activity?;2005.

Volume is Major Determinant of Health Benefits

- Volume
 - Total weekly amount of PA
 - Product of:
 - ◆ frequency (episodes / week)
 - ◆ intensity (level of effort / episode)
 - light, moderate, vigorous; METs
 - ◆ duration (time / episode)
- Volume more important to health benefits than any single component



Understanding Aerobic Intensity

- Two measures of intensity:
 - **Absolute** intensity = rate of energy expenditure during activity typically measured in METs
 - ◆ Commonly measured in METs where:
 - ◆ 1 MET = energy expenditure at rest
 - **Relative** intensity = level of effort compared to an individual's level of fitness

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"I toss and turn all night and you won't count that as an eight-hour aerobic workout?!"

Absolute Intensity

- Activities are classified based on amount of energy expended/minute (METs)
 - Light=0-2.9 METs
 - Moderate = 3.0 to 5.9 METs
 - Vigorous = 6.0+ METs
- Activities can be either light, moderate, or vigorous based on (usually) speed of doing them
 - Leisurely walk = light intensity
 - Brisk walk = moderate intensity
 - Race-walking = vigorous intensity



Relative Intensity

- Effort required relative to person's fitness level
- “talk test”
 - Moderate-intensity = can talk without pausing, but cannot sing
 - Vigorous-intensity = cannot say more than a few words without pausing for breath
- Relative intensity of a brisk walk depends on fitness and can be:
 - light-intensity for elite athletes
 - moderate-intensity for recreational walkers
 - high intensity for inactive middle-aged adults




Judging the Intensity of Activities


Physical activity	MET
Light intensity activities	< 3
sleeping	0.9
watching television	1.0
writing, desk work, typing	1.8
walking, 1.7 mph (2.7 km/h), level ground, strolling, very slow	2.3
walking, 2.5 mph (4 km/h)	2.9
Moderate intensity activities	3 to 6
bicycling, stationary, 50 watts, very light effort	3.0
walking 3.0 mph (4.8 km/h)	3.3
calisthenics, home exercise, light or moderate effort, general	3.5
walking 3.4 mph (5.5 km/h)	3.6
bicycling, <10 mph (16 km/h), leisure, to work or for pleasure	4.0
bicycling, stationary, 100 watts, light effort	5.5
Vigorous intensity activities	> 6
jogging, general	7.0
calisthenics (e.g. pushups, situps, pullups, jumping jacks), heavy, vigorous effort	8.0
running jogging, in place	8.0
rope jumping	10.0



Types of Muscle-Strengthening Activities

Type of Physical Activity	Age Group	
	Children	Adolescents
Muscle-strengthening 	<ul style="list-style-type: none">• Games such as tug-of-war• Modified push-ups (with knees on the floor)• Resistance exercises using body weight or resistance bands• Rope or tree climbing• Sit-ups (curl-ups or crunches)• Swinging on playground equipment/bars	<ul style="list-style-type: none">• Games such as tug-of-war• Push-ups and pull-ups• Resistance exercises with exercise bands, weight machines, hand-held weights• Climbing wall• Sit-ups (curl-ups or crunches)

Types of Bone-strengthening Activities

Type of Physical Activity	Age Group	
	Children	Adolescents
Bone-strengthening 	<ul style="list-style-type: none">• Games such as hopscotch• Jumping rope• Running• Sports such as gymnastics, basketball, volleyball, tennis	<ul style="list-style-type: none">• Jumping rope• Running• Sports such as gymnastics, basketball, volleyball, tennis



Physical Education and Academic Achievement¹

- **Nationally representative sample:** 5,316 students starting kindergarten in 1998–1999, followed through 5th grade
- **Physical education (PE) measure:** Low (0–35 mins/week), Medium (36–69), High (70–300)
- **Academic achievement measure:** Mathematics and reading tests designed by experts
- **Results:** A small but significant benefit on both math and reading tests were observed for girls in the high PE category compared with those in the low PE category; findings not seen in boys



1. Am J Pub Health 2008;98(4):72–7.

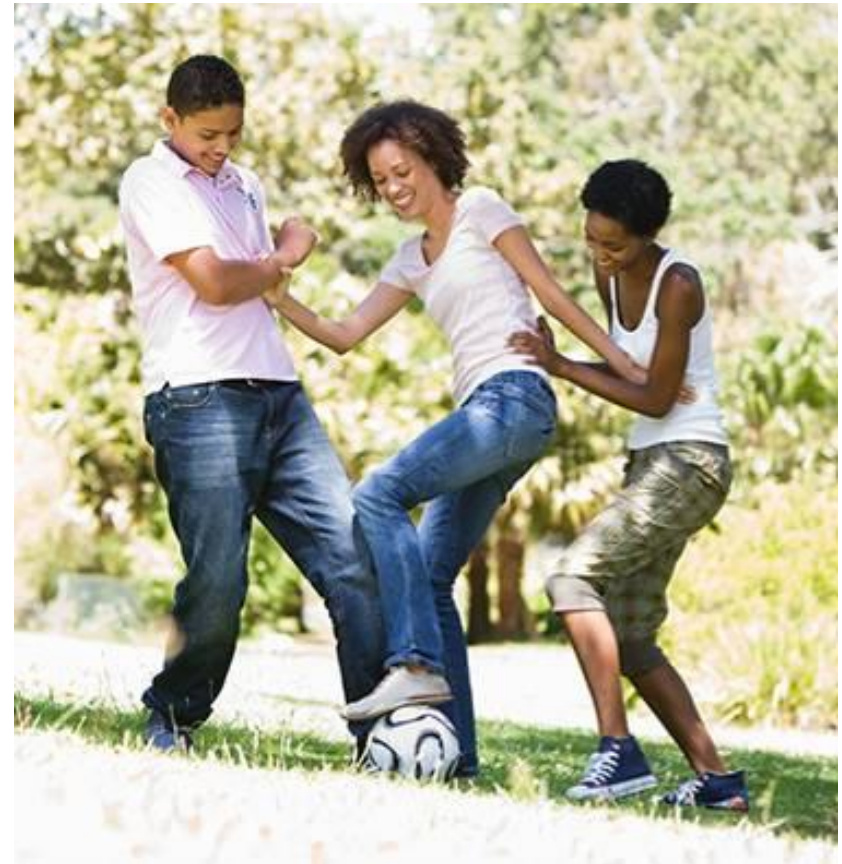
Children and Adolescents (ages 6-17) Guidelines

- 60 or more minutes of physical activity daily
 - Aerobic: Most of the 60 or more minutes per day should be either moderate- or vigorous-intensity aerobic PA. Include vigorous-intensity PA at least 3 days per week.
 - Muscle-strengthening: Include muscle-strengthening PA on at least 3 days of the week, as part of the 60 or more minutes.
 - Bone-strengthening: Include bone-strengthening PA on at least 3 days of the week, as part of the 60 or more minutes.
- Encourage participation in physical activities that are:
 - Age appropriate, enjoyable, and offer variety



How Are the Guidelines for Youth Different from the Guidelines for Adults?

- Take into consideration natural activity patterns of children
 - All episodes of moderate- or vigorous-intensity activities count toward daily requirement
 - Unstructured active play can provide all three types of physical activity
- Specify need for bone-strengthening activities and vigorous-intensity activities each week



Comments on Child and Adolescent Guidelines

- As opposed to adults, no choice on frequency
 - Daily PA required
- As children age, structured activity becomes more appropriate way to get PA
- Emphasis on variety of activity reflects attention to:
 - Importance of skill development
 - Reducing overuse injuries
 - Fun / adherence
- PA recommended for children with disabilities



The Battle Against Physical Inactivity Is Not a Solo Fight



Recommendations

- Parents, children, schools, medical personnel, all levels of government need to work together to promote regular PA
 - Limit sedentary behaviors (TV, video/computer games)
 - Parents to lead by example (Family oriented PA)
 - PA outside of gym class curriculum
 - School and community co-operative efforts
 - Policies to ensure safe equipment, facilities and routes to and from school
 - Policies to mandate daily quality school PE classes by trained specialists

Move It! Choose your FUN!

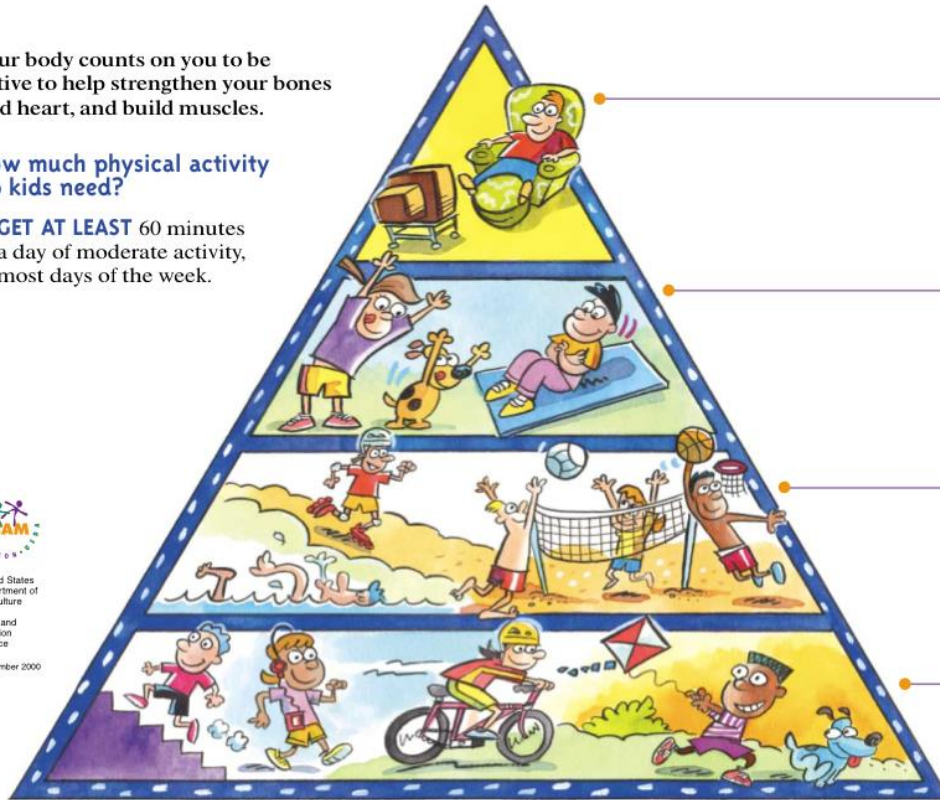
Your body counts on you to be active to help strengthen your bones and heart, and build muscles.

How much physical activity do kids need?

- **GET AT LEAST** 60 minutes a day of moderate activity, most days of the week.



United States
Department of
Agriculture
Food and
Nutrition
Service
September 2000



Do...

LESS

Spend less time sitting around watching TV or using the computer.

ENOUGH

Do enough strengthening activities to keep your muscles firm.

MORE

Do more intense activities that warm you up and make you glow!

PLENTY

Walk, wiggle, dance, climb the stairs. Just keep moving whenever you can.

Physical Activity Strategies for Youth

- Provide time for structured and unstructured activity during and outside school
 - Recess, PA breaks, PE, After-school programs
- Positive feedback and good role modeling
 - Praise, rewards, encouragement
 - Do NOT use activity as punishment
- Help young people learn skills
 - Understand intensity, set goals, protective gear
- Promote lifetime activities
 - Allow variety of activities



Persons With Disabilities

- Regular physical activity provides health benefits
 - Cardiovascular, muscular fitness
 - Improved mental health
 - Ability to do tasks of daily life
- In consultation with health-care provider
 - Understand how disability affects ability to do physical activity
 - If unable, adapt activity program to match abilities
 - Matching may require modifications such as:
 - ◆ Using arm ergometer or wheeling on bike path

Barriers to Meeting the Guidelines

- Personal
 - Attitude
 - Belief in ability to be physically active
- Social
 - Influence of their peers
 - Parental support
- Environmental
 - Safe locations to be active
 - Access to equipment
 - Financial costs of physical activities
 - Time





Thank you! Questions?

Be Active and Play, 60 minutes, every day!

