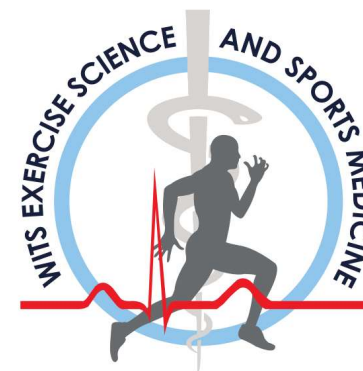




ACSM
EXERCISE IS
MEDICINE[®]
South Africa

Exercise in children – How much is enough? Prof Georgia Torres

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



100
1922
2022



Minimum Duration Requirements

Study	Activity Level	Duration Range	Observed Benefits	Population Characteristics
Janssen and LeBlanc, 2010	Moderate-to-vigorous physical activity	At least 60 minutes per day (some benefit at 30 minutes per day)	Multiple health benefits, dose-response; greater benefit with more activity	5–17 years, general population
Dobbins et al., 2013	Moderate-to-vigorous physical activity	12 weeks–4 years (interventions)	Increased moderate-to-vigorous physical activity (5–45 minutes more), improved maximal oxygen uptake, reduced television viewing	6–18 years, school-attending
Davis et al., 2011	Vigorous activity	20 or 40 minutes per day, 5 days per week, 13 weeks	Dose-response for executive function, math achievement	7–11 years, overweight

Study	Activity Level	Duration Range	Observed Benefits	Population Characteristics
Metcalf et al., 2012	Moderate-to-vigorous physical activity	At least 4 weeks (interventions)	Small increases in total physical activity (about 4 minutes per day), standardized mean difference 0.12–0.16	1.8–13.1 years, mixed body mass index
Epstein et al., 2001	Moderate-to-vigorous physical activity	Accumulated daily	About 30 minutes per day at at least 50% heart rate reserve; more than 60 minutes per day low-intensity	3–17 years
Atlantis et al., 2006	Moderate-to-high intensity	155–180 minutes per week (higher dose)	Standardized mean difference -0.4 for percent body fat ($P=0.006$); higher dose more effective	~12 years, overweight/obese
Füssenich et al., 2015	Moderate-to-vigorous and vigorous physical activity	At least 60 minutes per day moderate-to-vigorous; vigorous activity quintiles	Moderate-to-vigorous improved fitness/body composition; vigorous activity (17 minutes per day) needed for cardiovascular disease risk reduction	9–11 years, healthy
Gutin, 2008	Vigorous activity	At least 1 hour per day (cross-sectional); 155–180 minutes per week (intervention)	Lower percent body fat, visceral adipose tissue, improved fitness; dose-response	8–11 years, adolescents, black girls

Summary

- *Most studies focused on moderate-to vigorous or vigorous activity, with several reporting a dose-response effect and specific thresholds (at least 60 minutes per day or 155–180 minutes per week) associated with greater health benefits in children and adolescents.*
- *However, the magnitude of benefit varied, with some studies reporting only modest increases in activity or small effects on health outcomes.*



Intensity Level Impacts

Study	Activity Level	Duration Range	Observed Benefits	Population Characteristics
Janssen and LeBlanc, 2010	Vigorous versus moderate activity	Not always specified	Vigorous activity provides greater benefit, especially for bone health	5–17 years
Dobbins et al., 2013	Moderate-to-vigorous physical activity	12 weeks–4 years	Moderate-to-vigorous physical activity increased, maximal oxygen uptake improved; effect on body mass index small	6–18 years
Davis et al., 2011	Vigorous activity	20–40 minutes per day	Dose-response for cognitive or academic outcomes	7–11 years, overweight

Study	Activity Level	Duration Range	Observed Benefits	Population Characteristics
Metcalf et al., 2012	Moderate-to-vigorous physical activity	At least 4 weeks	Small effect on moderate-to-vigorous physical activity (standardized mean difference 0.16)	1.8–13.1 years
Epstein et al., 2001	Moderate-to-vigorous physical activity	Accumulated daily	About 30 minutes per day at at least 50% heart rate reserve; age predicts activity	3–17 years
Atlantis et al., 2006	Moderate-to-high intensity	155–180 minutes per week	Greater reduction in percent body fat at higher intensity or dose	~12 years, overweight/obese
Füssenich et al., 2015	Vigorous activity	Vigorous activity quintiles	Vigorous activity (17 minutes per day) needed for cardiovascular disease risk reduction; moderate-to-vigorous physical activity alone insufficient	9–11 years
Gutin, 2008	Vigorous activity	At least 1 hour per day	Lower percent body fat, visceral adipose tissue, improved fitness; moderate physical activity less effective	8–11 years, adolescents

Summary

- *The evidence suggests that higher intensity, particularly vigorous activity, is associated with greater benefits for certain outcomes, but the magnitude of effect is often modest.*



Health Outcomes

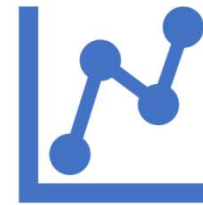
Cardiovascular Benefits

Study	Outcome Category	Exercise Parameters	Effect Direction	Implementation Context
Janssen and LeBlanc, 2010	Blood pressure, cholesterol, metabolic syndrome	At least 60 minutes per day moderate-to-vigorous physical activity, some vigorous activity	Improved blood pressure, cholesterol, metabolic markers	General population, school-aged
Dobbins et al., 2013	Blood cholesterol, blood pressure	School-based moderate-to-vigorous physical activity interventions	Improved cholesterol, little effect on blood pressure	School-based, 6–18 years

Study	Outcome Category	Exercise Parameters	Effect Direction	Implementation Context
Füssenich et al., 2015	Composite cardiovascular risk, blood pressure, vascular function	At least 60 minutes per day moderate-to-vigorous physical activity, vigorous activity quintiles	Moderate-to-vigorous physical activity improved fitness/body composition; vigorous activity reduced cardiovascular disease risk	Healthy, 9–11 years
Gutin, 2008	Cardiometabolic risk factors	At least 1 hour per day vigorous physical activity	Lower visceral adipose tissue, improved risk profile	Adolescents, black girls

Summary

- *All studies reported at least one improved cardiometabolic outcome with higher levels or intensities of physical activity.*
- *One study found little effect on blood pressure, while the others reported improvements in at least one outcome*



Physical activity for early years (birth – 5 years)

Active children are healthy, happy,
school ready and sleep better



BUILDS
RELATIONSHIPS
& SOCIAL SKILLS



MAINTAINS
HEALTH &
WEIGHT



CONTRIBUTES TO
BRAIN DEVELOPMENT
& LEARNING



IMPROVES
SLEEP



DEVELOPS
MUSCLES
& BONES



ENCOURAGES
MOVEMENT
& CO-ORDINATION

Every movement counts



PLAYGROUND



JUMP



CLIMB



MESSY PLAY



THROW/CATCH



SKIP



OBJECT PLAY



DANCE



GAMES



PLAY



TUMMY TIME



SWIM



WALK



SCOOT



BIKE

Move more. Sit less. Play together

UK Chief Medical Officers' Guidelines 2011 **Start Active, Stay Active:** www.bit.ly/startactive

Physical activity for children and young people (5–18 Years)



BUILDS
CONFIDENCE &
SOCIAL SKILLS



DEVELOPS
CO-ORDINATION



IMPROVES
CONCENTRATION
& LEARNING



STRENGTHENS
MUSCLES
& BONES



IMPROVES
HEALTH
& FITNESS



MAINTAINS
HEALTHY
WEIGHT



IMPROVES
SLEEP



MAKES
YOU FEEL
GOOD

Be physically active

Spread activity
throughout
the day

All activities
should make you
breathe faster
& feel warmer

Aim for
at least
60
minutes
everyday



Include muscle
and bone
strengthening
activities
**3 TIMES
PER
WEEK**



Sit less



Move more

Find ways to help all children and young people accumulate
at least 60 minutes of physical activity everyday

UK Chief Medical Officers' Guidelines 2011 Start Active, Stay Active: www.bit.ly/startactive



Physical Activity Guidelines for Americans

2nd edition

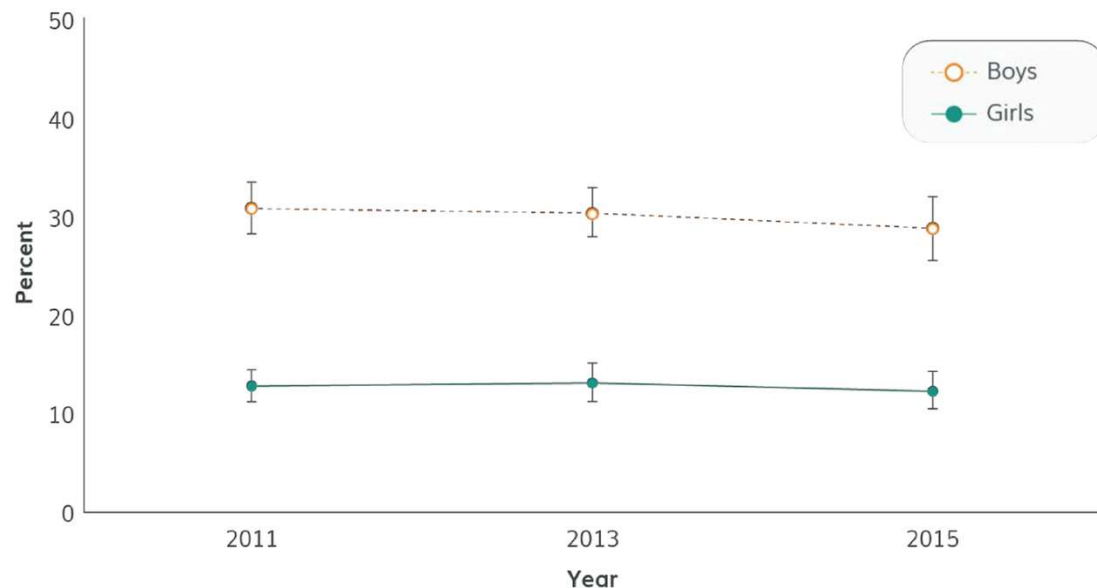




Why We Need to Promote Physical Activity, cont.

- Childhood obesity rates have tripled since the 1970s
- Obesity disqualifies nearly one-third of American youth, ages 17 to 24, from military service

Percentage of U.S. High School Students Who Met the Aerobic Physical Activity and Muscle-Strengthening Guidelines, 2011–2015





Key Guidelines for Preschool-Aged Children



- ✓ Preschool-aged children (ages 3 through 5 years) should be physically active throughout the day to enhance growth and development.
- ✓ Adult caregivers of preschool-aged children should encourage active play that includes a variety of activity types.



Key Guidelines for School-Aged Children and Adolescents

- ✓ It is important to provide young people opportunities and encouragement to participate in physical activities that are appropriate for their age, that are enjoyable, and that offer variety.
- ✓ Children and adolescents ages 6 through 17 years should do 60 minutes (1 hour) or more of moderate-to-vigorous physical activity daily:
 - Aerobic: Most of the 60 minutes or more per day should be either moderate- or vigorous-intensity aerobic physical activity and should include vigorous-intensity physical activity on at least 3 days a week.
 - Muscle-strengthening: As part of their 60 minutes or more of daily physical activity, children and adolescents should include muscle-strengthening physical activity on at least 3 days a week.
 - Bone-strengthening: As part of their 60 minutes or more of daily physical activity, children and adolescents should include bone-strengthening physical activity on at least 3 days a week.

AT A GLANCE

WHO GUIDELINES ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR



World Health
Organization

CHILDREN AND ADOLESCENTS

(aged 5–17 years)



In children and adolescents, physical activity confers benefits for the following health outcomes: improved physical fitness (cardiorespiratory and muscular fitness), cardiometabolic health (blood pressure, dyslipidaemia, glucose, and insulin resistance), bone health, cognitive outcomes (academic performance, executive function), mental health (reduced symptoms of depression); and reduced adiposity.

At least



60
minutes a day



moderate- to vigorous-intensity physical activity across the week; most of this physical activity should be aerobic.



- › **Vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone, should be incorporated at least 3 days a week.**

Strong recommendation, moderate certainty evidence

It is recommended that:

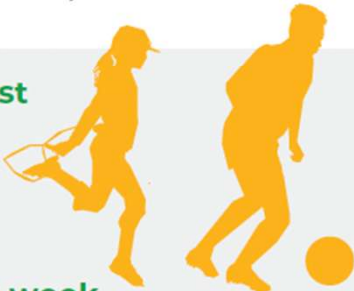
- › **Children and adolescents should do at least an average of 60 minutes per day of moderate- to vigorous-intensity, mostly aerobic, physical activity, across the week.**

Strong recommendation, moderate certainty evidence

On at least



3
days a week



vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone should be incorporated.





- Doing some physical activity is better than doing none.
- If children and adolescents are not meeting the recommendations, doing some physical activity will benefit their health.
- Children and adolescents should start by doing small amounts of physical activity, and gradually increase the frequency, intensity and duration over time.
- It is important to provide all children and adolescents with safe and equitable opportunities, and encouragement, to participate in physical activities that are enjoyable, offer variety, and are appropriate for their age and ability.

In children and adolescents, higher amounts of sedentary behaviour are associated with the following poor health outcomes: increased adiposity; poorer cardiometabolic health, fitness, behavioural conduct/pro-social behaviour; and reduced sleep duration.

It is recommended that:

- › **Children and adolescents should limit the amount of time spent being sedentary, particularly the amount of recreational screen time.**

Strong recommendation, low certainty evidence

LIMIT

the amount of time spent being sedentary, particularly recreational screen time.



Being Active with Your Young Child

 **ACSM**
EXERCISE IS
MEDICINE®

Encourage your child to be active to get them started on a lifetime of health. Play and movement activities help children develop important physical abilities, teaching confidence and motivation. Physical activity should be FUN and something they want to do on their own. Early activity is the stepping stone to an active life.

Experts now say that every minute adds up, so keep your child moving throughout the day! Being active as a child can actually decrease their future risk of cancer, stroke, obesity and disability.



Less Than 2 Years

Play

Do plenty of floor play to get your child's arms and legs moving. Tummy time with toys helps babies to develop strong neck and shoulder muscles.

Explore

Take your child out of their car seat unless you're in a car. Carry your infant around in a front carrier or on a hip to build head control and trunk strength. Limit their time in swings, strollers and bouncy seats – let them explore.

No Screen Time

This age group should have NO screen time. The more you play with them, the more they understand how to move their bodies. And you'll develop a stronger bond with your child instead of them being hypnotized by images on a screen.

Sleep

Children 4-12 months old need 12 -16 hours of sleep each day including naps. Kids 1-2 years old need 12 -14 total hours of sleep. It's great for their health – and yours too!

Ages 2-5 Years

Play

Do plenty of floor play to get your child's arms and legs moving. Tummy time with toys helps babies to develop strong neck and shoulder muscles.

- Outside play is best – in the backyard or on the playground
- Take walks around your neighborhood – go exploring together!
- Look for climbing and swinging equipment
- Find community gyms or swimming pools (YMCA's, Boys & Girls Clubs) that have classes to help develop kids' physical and social skills

Less Screen Time

Your 2-5- year-old should spend no more than 1 hour/day in front of a screen. Offer ideas to get them up and moving. Do chasing or follow-me types of games, dance to music, play Simon Says. Create new games. Every active moment you spend with your child is an opportunity to make a memory.

Sleep

Kids 3 - 5 years old need a total of 10 -13 hours of sleep each day including naps.

Ages 6-12 Years

Do SIXTY: Kids need 60 minutes of physical activity every day. This includes activity for their hearts, muscles and bones. Exercise should be vigorous on 3 days of the week. Fit in 5 or 10 minutes here and there. Or be active for 30-45 minutes. It's all good!

Keep It Simple

Help your child to sit less and move around more! Ask them to walk the dog. Ride a bike to school. Dance in their rooms. See how fast they can get up the stairs. Find opportunities to encourage activity throughout the day. Make it a game!

Find What's Fun

If they love it, they'll do it! Are they interested in soccer? Dance? Skateboarding? Shooting hoops? Swimming? Double Dutch? Invite their friends to be active together. They'll get social and active time.

Less Screen Time

Your child should spend no more than 2 hours sitting in front of the TV or computer each day. Seriously. After they're done with homework, send them outside to play or give them active chores.

Sleep

Kids ages 6 -12 years old need 9 -12 hours of sleep each day including naps. Turn off screens at least 1 hour before bedtime. Keep bedrooms cool, dark and quiet. They'll do better in the classroom and on the playground.

Grade Schoolers – Active THEIR Way

The activities below count towards the recommended daily 60 minutes. Mix it up. Find what works best for your child – before, during or after school. Think about “activity snacks” just like food snacks. Do fun things together as a family. Jump around during TV commercials.

Vigorous-Intensity Aerobic Activity

Running, bike riding (faster), soccer, basketball, tag, flag football, jump rope, martial arts, hip hop dancing

Moderate-Intensity Aerobic Activity

Brisk walking, bike riding, skateboarding, swimming, catch and throw games like baseball or stickball

Muscle Strengthening

Weightlifting (only with trained supervision), climbing, wrestling, tug-of-war

Bone Strengthening

Hopping, skipping, jumping, running, sports with jumping, fast movements and changes of direction

InPACT by the Numbers

Interrupting Prolonged Sitting with Activity (InPACT) is a classroom-based physical activity intervention that emphasizes children's natural physical activity patterns through the implementation of short, intermittent bouts of activity throughout the school day. Teachers are uniquely positioned to create a culture of health and wellness in their schools. InPACT is a feasible, low-cost strategy to reduce prolonged sitting time while simultaneously increasing structured physical activity opportunities and improvement on-task behaviors in the classroom.



99%

of students returned to task within 30 seconds of completing an activity break



Students reported an

8

out of 10

on their confidence to complete 30 minutes of physical activity every day at school

85%

of students were exercising at a moderate-to-vigorous intensity



Children reported a

4.2

out of 5

on an enjoyment scale during activity breaks



On average, teachers were able to implement

5

activity breaks per day in their classrooms

Average transition time to activity breaks was

55 seconds

The shortest time was



2 seconds

Teachers preferred fewer breaks that lasted

4
minutes



75%

of teachers were exercising at a moderate-to-vigorous intensity

Ten Tips for Building Fit Kids

The Big Picture

Physical activity (PA) is a learned behavior that is influenced by a child's family, friends and environment.



Start Positive

Positive behaviors established early in life tend to carry over into adulthood.



Have Fun!

Children participate in PA to have fun, make friends and learn something new.



Mix it up

Sport diversification early in life should expose children to a wide variety of physical activity and movement experiences.



Improve Physical Fitness

Children should participate in exercise and sport programs to enhance both health- and skill-related components of physical fitness.



Develop Movement Skills

Fundamental movement skills such as jumping, kicking and throwing are learned movement patterns.



Build Strong Muscles and Bones

With qualified instruction, resistance training using bodyweight, simple equipment or free weights, can be a safe, effective and enjoyable activity for children.



Raise the pulse

Children should regularly take part in vigorous exercise, which requires activities that really raise heart rate and get children out of breath.



Just Move!

All types of PA – whether continuous, sporadic or in bouts – are beneficial for children.



Stay Active

Children should engage in PA throughout the day with active transportation, physical education, recess, recreational exercise, sport activities and outdoor play.

