THE ROLE OF PHYSICAL EDUCATION IN ENHANCING ADOLESCENT MENTAL HEALTH
THURSDAY, MAY 3, 2018

Session Hosts:

- U.S. Department of Health and Human Services (HHS), Office of the Assistant Secretary for Health’s Region 5 Adolescent Health Network
- Illinois Alliance to Prevent Obesity

2018 programming is focused on adolescent mental health and well-being and intersecting health and social issues

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Send an e-mail to LISTSERV@LIST.NIH.GOV with only this text in the message body:
subscribe REGION-V-adolescenthealthnetwork “your name”

Contact Lesley.Craig@hhs.gov for more information.
MAY IS NATIONAL TEEN PREGNANCY PREVENTION MONTH (#NTPPM)

Want to get involved? Your organization can be a catalyst for change whether you have two minutes, two hours, or two days to devote.


REGION 5 WEBINAR NEXT WEEK!

Identifying Needs of Youth in Foster Care and Juvenile Justice – Adapting Evidence-Based Teen Pregnancy Programs through a Trauma-Informed Approach
Thursday, May 10, 2018 • 2:00-3:00 p.m. ET

Questions? Contact Lesley.Craig@hhs.gov

Led by the HHS Office of Adolescent Health (OAH), TAG is a national call to action to improve adolescent health in the U.S. It aims to reach and engage a wide array of professionals who touch adolescents’ lives, as well as parents and young people themselves. It includes both protective and behavioral risk factors and emphasizes building on young people’s strengths.

TAG highlights Five Essentials for Healthy Adolescents:
1. Positive connections with supportive people,
2. Safe and secure places to live, learn, and play,
3. Access to high-quality, teen-friendly health care,
4. Opportunities for teens to engage as learners, leaders, team members, and workers, and
5. Coordinated, adolescent- and family-centered services.

http://www.hhs.gov/ash/oah/tag
Resources

**Physical Activity Guidelines for Americans** – includes Midcourse Report: Strategies to Increase Physical Activity Among Youth (3-17 years)

[https://health.gov/paguidelines/](https://health.gov/paguidelines/)

**CDC School Health Profiles** - system of surveys assessing school health policies and practices in states, large urban school districts, and territories.

- School health education requirements and content
- Physical education and physical activity

✓ Q SAMPLE: “Is a required physical education course taught in each of the following grades in your school?”

✓ Q SAMPLE: Outside of physical education, do students participate in physical activity breaks in classrooms during the school day?

✓ Q SAMPLE: Does your school offer opportunities for all students to participate in intramural sports programs or physical activity clubs?

[https://www.cdc.gov/healthyyouth/data/profiles](https://www.cdc.gov/healthyyouth/data/profiles)

**CDC MMWR**: Health-Related Behaviors and Academic Achievement Among High School Students — United States, 2015

**CDC Adolescent and School Health**: Health & Academics

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**Region 5 State Physical Education Policies**

*(Does not include Recess/Physical Activity/Extracurricular Activities)*

**Illinois** – no minimum minutes:
- Required a minimum of 3 days per week, K-12 grades, with some individual and school waivers available

**Indiana** – no days/minutes indicated:
- IAC 6.1-5.2.6 (Elementary School)
- IAC 6.1-5.3.6 (Middle School)
- 511 IAC 6-7-6 (High School)
- IC 20-30-5-7.5

**Michigan**
- Act 451 of 1976 - 380.1278a (requirement for high school diploma)
- K-12 PE Standards published May 2017 by the Michigan Department of Education
- State Board of Education Model Policy on Quality Physical Education and Physical Activity in Schools recommends instructional PE
Region 5 State Physical Education Policies
(Does not include Recess/Physical Activity/Extracurricular Activities)

**Minnesota**
- Use National Association for Sport and Physical Education (NASPE) standards as state standards: local districts are required to develop their own benchmarks (outcomes), curriculum, and assessments:
  - K-8 students must receive physical education every year
  - High School students must receive physical education at least once
- *In 2021–22 school year, all schools will be required to implement the new 2018 MN Physical Education Standards and Grade-Level Benchmarks*

**Ohio** - no minimum minutes:
- 3313.60 Prescribed curriculum for K-8 includes Physical Education (6)
- High School students need .5 units (120 hours) of PE instruction, with some individual and school waivers available
- ORC3302.32- All students must be evaluated once per grade band (K-2, 3-5, 6-8, 9-12) on the Physical Education Benchmarks

**Wisconsin** - no minimum minutes:
- PE. required for K-8 students
- PE. required for High School students (credit needed for graduation) and one may be an option

**DISCLAIMER:** The content and views contained in these presentations do not necessarily represent the official policies of the Office of the Assistant Secretary for Health or the U.S. Department of Health and Human Services.
Presenters

Sarah Chusid, MPS  
Program Manager, Center for Policy & Partnership Initiatives  
Illinois Public Health Institute  
Illinois Alliance to Prevent Obesity

Presenters

Dr. John Ratey  
Associate Clinical Professor of Psychiatry  
Harvard Medical School
Presenters

Paul Zientarski
Retired P.E. Department Chairman, Naperville Central High School
Board member - DuPage FORWARD

Illinois Alliance to Prevent Obesity

• Statewide coalition working on obesity prevention through policy, systems, and environmental changes
• Developed Obesity Action Roadmap through statewide stakeholder engagement process in 2010.
• More than 150 organizations have endorsed Roadmap
• Lead by Leadership Committee
• Healthy & Active Communities Network connects local wellness coalitions focusing on policy, systems, and environmental changes related to nutrition/physical activity
Defining Physical Education (P.E.)

Physical Education (P.E.) is a planned sequence of developmentally appropriate activities and games that educates students about and through movement.

The planned curriculum also provides opportunities for students to learn about the importance of being active, and working with others as they practice physical skills.

Characteristics of High-Quality P.E.

- Standards-based
- Developmentally appropriate
- MVPA for 50% of class time
- Follows appropriate instruction
- Taught by certified P.E. teacher
- Provides skill development opportunities that set students up for a lifetime of physical fitness
What’s the difference? Physical Activity vs. Physical Education

**Physical Activity** is movement of the body that expends energy.

**Physical Education** is a planned, sequential and developmentally-appropriate K-12 curriculum that provides cognitive content and learning experiences using PHYSICAL ACTIVITY as a teaching tool.

The Science: Linkages between P.A./ P.E., and Adolescent Mental Health/ Wellbeing

Dr. John Ratey
In order for a man to succeed in life, God provided him with two means, education and physical activity. Not separately, one for the soul and the other for the body, but for the two together. With these two means, man can attain perfection.

Plato

IF YOU’RE IN A BAD MOOD, GO FOR A WALK...

IF YOU’RE STILL IN A BAD MOOD, GO FOR ANOTHER WALK.

HIPPOCRATES
Exercise and Depression

ZOLOFT VS EXERCISE at 4 Months

Figure 3. Observed mean depression scores before and after treatment. All changes from pretreatment to posttreatment were statistically significant (P<.001 for all). The treatment groups did not differ on baseline or posttreatment levels of depression. Error bars represent SEs. HAM-D indicates Hamilton Rating Scale for Depression; BDI, Beck Depression Inventory.

3 x wk for 16 wks (30 minutes)- 75-80% of Cardiac reserve.

EMOTIONAL REGULATION

EXERCISE PLAY

OPTIMIZING COGNITIVE FUNCTIONING
Keep your Brain Young
Exercise and Play

Depression and Exercise

- A community sample of children living in Trondheim, Norway, comprising a total of 795 6-year-old children was followed up at 8 (n = 699) and 10 (n = 702) years of age.

- At both age 6 and 8 years, higher MVPA predicted fewer symptoms of major depressive disorders 2 years later. Sedentary behavior did not predict depression, and depression predicted neither MVPA nor sedentary activity.

Physical Activity, Sedentary Behavior, and Symptoms of Major Depression in Middle Childhood. *Pediatrics*, 2017 Feb;139(2). Zahl T1,2, Steinsbekk S2, Wichstrøm L1,2.
Role of physical activity (PA) in diabetes management and prevention.


PA weight loss and weight management improves insulin/glucose profile for people with pre-diabetes, glycemic control in people with type 2 diabetes, and quality of life for everyone.

Type 2 diabetes – reduces risk of cardiovascular disease.

Average composite of 20 students' brains taking the same test:
- Brain after sitting quietly
- Brain after 20 minute walk

Research/scan compliments of Dr. Chuck Hillman, University of Illinois.
Effects of a selected exercise program on executive function of children with attention deficit hyperactivity disorder.

- The participants were 40 male students, aged 7-11 years. The participants were randomly assigned into two groups.
- The experimental group participated in an exercise program for 24 sessions, 90 minutes per session.
- Pre and Post Stroop and Go-No-Go tests,
- cognitive inhibition of the children in the experimental group was significantly different compared with the control group (p < 0.05).
- there was a significant difference between the experimental and control groups in the behavioral inhibition (p < 0.05).
NEUROCHEMISTRY

Norepinephrine
- Alertness
- Concentration
- Energy
- Anxiety
- Impulse
- Irritability
- Attention

Serotonin
- Obsessions
- Compulsions
- Memory
- Appetite
- Sex
- Aggression
- Mood
- Cognitive Function

Dopamine
- Pleasure
- Reward
- Motivation/Drive

= NORADRENALINE
= \textbf{DOPAMINE}
How Far Do I have to Run Today?

Exercise & Learning
The JACK Effect
Public Magnet School  Grades 4-8  Approximately 120 children
All on school breakfast and lunch programs.
Program: Added 40 minutes of exercise in the morning
        Exercise was performed in gym in station format.
        Activities included:
        Basketball   Dance Dance Revolution
        Double Dutch” jump roping  Pogo stick jumping

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<tr>
<td>Suspensions:</td>
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<td>71</td>
<td>24</td>
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Teachers reported:
Students are more focused. Students are more focused during the MAP
(Measure of Academic Progress) testing as well.
Teachers observed:
Students testing immediately after morning activities did better — meeting or
exceeding individual growth targets — than middle scholars taking the test late morning or in the
afternoon.
The Prefrontal Cortex
Major Role in Executive Function

- EXERCISE particularly affects our Executive Function
  - Planning
  - Organization
  - Initiate or delay a response
  - Consequence evaluation
  - Learning from mistakes
  - Maintain the focus
  - Working Memory

- Dysfunction in these areas leads to disruption in the organization and control of behavior

http://www.driesen.com/prefrontal_cortex.htm

Time In versus Time Out
BOKS leads to Positivity

- 707 children-24 wks, 2days and 3days/wk
- Children in the 3 days/week group demonstrated improvement in their student engagement scores (0.79 units, p1/40.05) and had nonsignificant improvements in reported peer relationships, affect, and life satisfaction versus comparison.
- The 2 days/week group had significant improvements in positive affect and vitality/energy versus comparison.
- Conclusions: A 3 days/week before-school physical activity program resulted in improved BMI and prevented increases in child obesity. Both BOKS groups had improved social–emotional wellness versus controls.
Fitter you are the happier you are

- 110 overweight/obese children 61 boys
- Absolute upper-body muscular strength was negatively associated with stress and negative affect
- Cardiorespiratory fitness and relative upper-body muscular strength were positively associated with optimism
- absolute lower-body muscular strength was negatively associated with negative affect


Fitness and Well-being

![Fitness and Well-being Graph](image)

FIGURE 3—Mean scores for emotional well-being by CR fitness level, adjusted for age, BMI, and years of participation. Superscripts indicate significant differences between CR fitness groups (all \( P \) values <0.0001).
WHAT KIND OF EXERCISE

- Researchers had rats do high-intensity interval training on treadmills, resistance training by climbing a ladder with tiny weights on their tails, and aerobic training on running wheels. Six to eight weeks later, they studied tissue from each rat’s hippocampus, a key part of the brain for memory and learning. Here’s what they found:

- Rats that did resistance training were stronger than when they started, but their brains showed no signs of new cell growth compared with those of control animals. Researchers say this training probably leads to other positive changes, such as the creation of blood vessels and new connections between brain cells.

- Rats that did interval training were certainly fitter and had some new neurons in their brains, but researchers believe that the intensity of the workouts may stress the body and undercut certain brain benefits.

- Rats that did aerobic training showed robust neurogenesis (the creation of new brain cells), and the farther they ran, the more new cells their brains created. Other studies have found that aerobic workouts — including activities such as cycling, running, and cross-country skiing — can double or even triple the number of new neurons in test animals’ hippocampi.
Chongqing 28 million people

MICHAEL PHELPS OFF RITALIN
RESEARCH CONTINUES

= ENDORPHINS
ENDOCANNABINOIDS
When the Dog walker did not show up

Case Study:
Enhanced P.E. in Illinois
P.E. in Illinois: The Big Picture

“Enhanced Physical Education (P.E.)” was selected as an evidence-based intervention to increase the length of, or activity levels in, Illinois school-based P.E. classes.

Roadmap to High-Quality P.E. in Illinois

- Enhanced P.E. approach
- Revising the state learning standards *(Effective 2015-16 academic year)*
- A new law requiring fitness testing *(Effective 2016-17 academic year)*
- Reporting the average number of days of physical education (P.E.) schools provide per week per student on the Illinois Report Card.

A note about daily P.E.
A note about daily P.E.

- Districts now have discretion to implement up to 5 days per week with a minimum of 3 days per week
- Moving toward a minutes-per-week requirement:
  • Would give districts flexibility in scheduling while ensuring students get recommended amount of P.E.

Professional Development for P.E. teachers

Pump Up P.E.
Promote health, learning, and lifelong fitness in your region!
A program with proven results

An independent evaluation by the Consortium to Lower Obesity in Chicago Children found **statistically significant increases in:**

- Knowledge and capacity of teachers trained through this program
- Physical activity levels in P.E. classes at schools that sent teachers to the training and other professional development opportunities

How have we used the Research?

We collected data!
Academic Reading Data

52-56% Better

Math Data

93% Better
P.E. and ROI

- Physical activity is associated with improved academic, health & behavioral outcomes
- Physical activity lowers chronic disease risk
- Movement prepares the mind for learning
- P.E. provides students with skills, knowledge & confidence for a lifetime of healthy habits and fitness!

On behalf of our Session Hosts
U.S. Department of Health and Human Services (HHS), Office of the Assistant Secretary for Health’s Region 5 Adolescent Health Network
and
Illinois Alliance to Prevent Obesity

Thank You

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