Youth

Chair: Russ Pate

Members: Chuck Hillman, Kathy Janz, Peter Katzmarzyk, Ken Powell, Melicia Whitt-Glover
Subcommittee Members

Chair: Russ Pate, PhD
University of South Carolina

Chuck Hillman, PhD
Northeastern University

Kathy Janz, EdD
University of Iowa

Peter Katzmarzyk, PhD
Pennington Biomedical Research Center

Melicia Whitt-Glover, PhD
Gramercy Research Center

Ken Powell, MD, MPH

Federal Liaison: Deb Galuska, PhD
Centers for Disease Control and Prevention

ICF Liaison: Sondra Dietz
1. In children 5 years of age and younger, what is the relationship between physical activity and health outcomes?

2. In youth, what is the relationship between physical activity and health outcomes?
   a. Is physical activity related to cardiorespiratory fitness, weight status, and other cardiometabolic risk factors?
   b. Does physical activity prevent or reduce excessive weight gain that results in overweight or obesity?
   c. Are muscle-strengthening and bone-strengthening physical activity related to musculoskeletal health?
   d. Does recent evidence inform description of dose-response curves for established associations?

3. In youth, what is the relationship between sedentary behavior and health outcomes?
Question 1

• In children 5 years of age and younger, what is the relationship between physical activity and health outcomes?
Question 1 - Background

- Current guidelines do not address children under 6 years of age
- Much recent research has focused on physical activity during early childhood
- PA guidelines for this group have been issued in other countries
- Many policy developments in childcare settings
Question 1 – Search Process

• Phase 1
Systematic reviews and meta-analyses
Search Results Q1: High Quality Reviews

Identification
- PubMed database searching N = 222
- Cochrane database searching N = 112
- CINAHL database searching N = 6

Records after duplicates removed N = 335

Screening
- Titles screened N = 335
  - Excluded based on title N = 51

- Abstracts screened N = 284
  - Excluded based on abstract N = 247

Eligibility
- Articles for review of full text N = 37
  - Excluded based on full text N = 37

Included
- Studies included N = 0

1 Reviews include systematic reviews, meta-analyses, and pooled analyses.
Question 1 – Search Process

• Phase 2

Original Research
Search Results Q1: Original Research

Identification
- PubMed database searching N = 363
- Cochrane database searching N = 765
- CINAHL database searching N = 21

Records after duplicates removed N = 1040

Screening
- Titles screened N = 1040
- Excluded based on title N = 629
- Abstracts screened N = 415
- Excluded based on abstract N = 352

Eligibility
- Articles for review of full text N = 63
- Excluded based on full text N = TBD

Included
- Studies included from supplementary strategies N = 3
- Studies included N = TBD
Question 1

• Consideration of markers of Bone Health as Outcomes Related to Physical Activity in Early Childhood
Search Results Q1: Original Research (Bone)

Identification
- PubMed database searching N = 363
- Cochrane database searching N = 765
- CINAHL database searching N = 21

Records after duplicates removed N = 1040

Screening
- Titles screened N = 1040
- Excluded based on title N = 629
- Abstracts screened N = 415
- Excluded based on abstract N = 352
- Articles for review of full text N = 63
- Excluded based on full text N = TBD

Eligibility
- Studies included from supplementary strategies N = 3

Included
- Studies included N = TBD

Articles for review of full text N = 63

Studies with “bone” in title or abstract N = 8

Excluded based on full text N = 1

Studies included N = 10
• Preliminary Conclusion to Bone Health Outcome
  – Primary literature search resulted in 10 papers relevant to bone health outcomes in children under 6
  – Higher levels of physical activity are associated with better bone-related outcomes in studies that examine
    • Overall physical activity
    • Specific physical activity exposure (e.g. gymnastics)
  – No conclusion about a specific dose-response relationship
Next steps:

- Consider literature on other health outcomes
- Focus on weight, fatness variables
- Draw conclusions regarding answer to Question 1
Question 2

Subcommittee Member Assignments

In youth, what is the relationship between physical activity and health outcomes?

a. Is physical activity related to cardiorespiratory fitness, weight status, and other cardiometabolic risk factors?
   • Cardiorespiratory fitness – Janz, Whitt-Glover, Hillman
   • Dyslipidemia, insulin resistance, blood pressure, waist circumference, and glucose – Katzmarzyk, Powell

b. Does physical activity prevent or reduce excessive weight gain that results in overweight or obesity?
   • Pate, Katzmarzyk
Question 2

Subcommittee Member Assignments

In youth, what is the relationship between physical activity and health outcomes?

c. Are muscle-strengthening and bone-strengthening physical activity related to musculoskeletal health?
   • Janz, Whitt-Glover, Hillman

d. Does recent evidence inform description of dose-response curves for established associations?
   • Powell, Pate
Analytical Framework

**Systematic Review Question**
In youth, what is the relationship between physical activity and health outcomes?

**Target Population**
Children, ages 0–18

**Comparison**
Least active subgroup

**Intervention/Exposure**
All types and intensities of physical activity, including any kind of play (structured or free), sports, and other activities

**Endpoint Health Outcomes**
- Bone density
- Bone strength
- Cardiorespiratory fitness
- Cardiometabolic risk factors
  - Blood pressure
  - Dyslipidemia
  - Glucose
  - Insulin resistance
  - Waist circumference
- Musculoskeletal health
- Obesity
- Overweight
- Weight gain
Common Inclusion/Exclusion Criteria

• **Language**
  – Exclude: Studies that do not have full text in English

• **Publication Status**
  – Include: Studies published in peer-reviewed journals, PAGAC-approved reports
  – Exclude: Grey literature

• **Study Subjects**
  – Exclude: Studies of animals only
Inclusion/Exclusion Criteria

- **Date of Publication**
  - Original Research: Anytime
  - Existing Sources: Include 2006–Present
- **Study Subjects**
  - Include: Children ages 0–18
- **Study Design**
  - Include: Randomized controlled trials, Non-randomized controlled trials, Prospective cohort studies, Retrospective cohort studies, Case-control studies, Before-and-after studies, Time series, Systematic reviews, Meta-analyses, Pooled analyses, PAGAC-Approved reports
  - Exclude: Narrative reviews, Commentaries, Editorials, Cross-sectional, Study protocol
- **Exposure/Intervention**
  - Include: All types and intensities of physical activity
  - Exclude: Missing physical activity; Single, acute session of exercise; Therapeutic exercise; Physical fitness as the exposure; Only used as confounding variable
- **Outcome**
  - Include: Bone density, Bone strength, Cardiorespiratory fitness, Cardiometabolic risk factors (Blood pressure, Dyslipidemia, Glucose, Insulin resistance, Waist circumference), Musculoskeletal health, Obesity, Overweight, Weight gain
<table>
<thead>
<tr>
<th>Physical Activity Terms</th>
<th>Recreational Activity Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active games</td>
<td>Recreational activity(ies)</td>
</tr>
<tr>
<td>Active play</td>
<td>Screen time</td>
</tr>
<tr>
<td>Active recreation</td>
<td>Television (TV) viewing</td>
</tr>
<tr>
<td>Free play</td>
<td>Television (TV) watching</td>
</tr>
<tr>
<td>High intensity activity(ies)</td>
<td>Tummy Time</td>
</tr>
<tr>
<td>Low intensity activity(ies)</td>
<td>Video game</td>
</tr>
<tr>
<td>Moderate to vigorous activity(ies)</td>
<td>Video gaming</td>
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<tr>
<td>Muscle-strengthening</td>
<td>Vigorous activity(ies)</td>
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<tr>
<td>Outdoor play</td>
<td>Walk</td>
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<tr>
<td>Play and playthings</td>
<td>Youth sports</td>
</tr>
<tr>
<td>Recess</td>
<td></td>
</tr>
</tbody>
</table>
Search Terms: Outcome

Adiposity
Asthma
Blood glucose
Blood lipids
Blood pressure
Body composition
Body Mass Index
BMI
Bone density
Bone geometry
Bone mineral content
Bone mineral density
Cardiometabolic risk factor(s)
Diabetes Mellitus, Type 2
Dyslipidemia(s)
Fatness
Hyperglycemia
Hypertension
Insulin resistance
Metabolic syndrome
Metabolic syndrome X
Muscle mass
Musculoskeletal development
Musculoskeletal fitness
Obese
Obesity
Type 2 Diabetes