Healthy Active Living in the Early Years (aged 0-4 years)

M. Tremblay, A. LeBlanc, K. Adamo, G. Goldfield

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Children’s Hospital of Eastern Ontario Research Institute
Chief Scientific Officer, Active Healthy Kids Canada
Professor, Department of Pediatrics, University of Ottawa
www.haloresearch.ca
Early Years are a Critical Period

- Recognized as critical developmental period
- Physical, mental, emotional and social malleability
- Opportunity for moulding child AND parent behaviour
- Expand movement experience and physical literacy
- Behaviours may track through the lifespan
- Possible proximal and distal health and wellness benefits
- WHO estimates >42 million children <5 years are overweight
- Strong demand for early years guidelines - release of PA guidelines for the early years by Australia in 2010 and the UK in 2011
“we spend the first two years of life teaching kids to walk and talk – and then the next 16 years telling them to sit down and shut up”

anonymous
Canadian Early Years Guidelines: 
Process Overview

Canadian Physical Activity Guidelines for the Early Years 
(aged 0-4 years)

Canadian Sedentary Behaviour Guidelines for the Early Years 
(aged 0-4 years)
<table>
<thead>
<tr>
<th>Guideline development stage</th>
<th>Key stakeholders</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
<tr>
<td>1. Establishing a leadership team</td>
<td>Government, physical activity scientific and professional groups, public health groups, guideline development secretariat</td>
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<tr>
<td>2. Establishing and implementing process assessment procedures</td>
<td>Leadership team, process consultants, systematic review experts</td>
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<td>3. Forming a guideline development and research committee</td>
<td>Leadership team, stakeholder groups</td>
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<td>4. International and interjurisdictional harmonization</td>
<td>Leadership team, guideline development and research committee, international partners, stakeholder groups</td>
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<td>5. Literature review</td>
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<td>6. Interpretation of findings</td>
<td>Guideline development and research committee, independent scientific panel, process consultants</td>
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<tr>
<td>7. Identification of research gaps</td>
<td>Leadership team, research committee, research granting agencies</td>
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<td>8. Stakeholder consultation, consensus, and endorsement</td>
<td>Government, physical activity scientific and professional groups, public health, stakeholder groups</td>
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<td>9. Knowledge translation strategy</td>
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<td>10. Language translation</td>
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<td>11. Presentation and messaging</td>
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<td>12. Communication</td>
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<td>13. Dissemination</td>
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<td>14. Evaluation</td>
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<td>15. Planning and cycling of updates and revisions</td>
<td>Leadership team, guideline development secretariat</td>
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</table>
6 domains, 23 items:

1. Scope and purpose
2. Stakeholder involvement
3. Rigour of development
4. Clarity of presentation
5. Applicability
6. Editorial independence

Courtesy of Dr. Michelle Kho
CANADIAN PHYSICAL ACTIVITY GUIDELINES FOR THE EARLY YEARS

Aged 0-4 years
Systematic review of physical activity and health in the early years (aged 0–4 years)


Research question

What is the frequency, intensity, time and type of physical activity, as measured by direct and indirect methods, associated with improved health indicators in preschool aged children (0-4 years)?
Age groups

- Infants: 0 - 1.0 years
- Toddlers: 1.1 - 3.0 years
- Preschoolers: 3.1 - 4.99 years
- Defined collectively as “the early years”
# Health Indicators

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<td>Unimportant</td>
<td>Unimportant</td>
<td>Important</td>
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<tr>
<td>Risks (injury)</td>
<td>Critical</td>
<td>Critical</td>
<td>Critical</td>
</tr>
</tbody>
</table>
What did we find

- 5 studies in infants
- 2 studies in toddlers
- 11 studies in preschoolers
- 12,742 enrolled participants from 8 countries
- Articles from 1972 to 2011
In preschoolers, there was low- to high-quality evidence on the relationship between increased or higher physical activity and improved measures of adiposity, motor skill development, and cardiometabolic health indicators.

In toddlers, there was moderate-quality evidence to suggest increased or higher physical activity was positively associated with bone and skeletal health.

In infants, there was low- to moderate-quality evidence to suggest that increased or higher physical activity is associated with improved measures of adiposity, motor skill development, and cognitive development.

What is the evidence

“In infants, there was low- to moderate-quality evidence to suggest that increased or higher physical activity is associated with improved measures of adiposity, motor skill development, and cognitive development.”

“In toddlers, there was moderate-quality evidence to suggest increased or higher physical activity was positively associated with bone and skeletal health.”

“In preschoolers, there was low- to high-quality evidence on the relationship between increased or higher physical activity and improved measures of adiposity, motor skill development, psychosocial health, and cardiometabolic health indicators.”
## Baseline Characteristics

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<th></th>
<th>Girls</th>
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<tr>
<td></td>
<td>3 years</td>
<td>4 years</td>
<td>5 years</td>
<td>3 years</td>
<td>4 years</td>
<td>5 years</td>
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<tr>
<td>n</td>
<td>68</td>
<td>67</td>
<td>73</td>
<td>70</td>
<td>70</td>
<td>70</td>
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<tr>
<td>Height, cm</td>
<td>97.7 ± 4.3</td>
<td>106.5 ± 5.0</td>
<td>112.8 ± 5.0</td>
<td>99.8 ± 4.7</td>
<td>108.1 ± 5.2</td>
<td>113.8 ± 4.8</td>
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</tr>
<tr>
<td>Body mass, kg</td>
<td>15.2 ± 1.6</td>
<td>17.9 ± 2.4</td>
<td>19.7 ± 3.1</td>
<td>16.0 ± 2.2</td>
<td>18.5 ± 2.7</td>
<td>20.2 ± 2.9</td>
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<tr>
<td>% overweight/obese</td>
<td>16%</td>
<td>21%</td>
<td>12%</td>
<td>16%</td>
<td>17%</td>
<td>11%</td>
<td>16%</td>
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*Timmons et al. BMC Public Health 2012, 12:284
http://www.biomedcentral.com/1471-2458/12/284*

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**STUDY PROTOCOL**

**Open Access**

The health outcomes and physical activity in preschoolers (HOPP) study: rationale and design

Brian W Timmons¹, Nicole A Proudfoot¹, Maureen J MacDonald², Steven R Bray² and John Cairney³
Aerobic Fitness

Does meeting the guidelines matter for aerobic fitness?

- **Treadmill time, min**
  - Meeting: 10, 11
  - Not-meeting: 9, 10

- **Heart rate recovery, bpm**
  - Meeting: 60, 70
  - Not-meeting: 60, 60
Motor Skill Development

Does meeting the guidelines matter for motor skill development?
Canadian Physical Activity Guidelines for the Early Years (aged 0–4 years)

Mark S. Tremblay, Allana G. LeBlanc, Valerie Carson, Louise Choquette, Sarah Connor Gorber, Carrie Dillman, Mary Duggan, Mary Jane Gordon, Audrey Hicks, Ian Janssen, Michelle E. Kho, Amy E. Latimer-Cheung, Claire LeBlanc, Kelly Murumets, Anthony D. Okely, John J. Reilly, John C. Spence, Jodie A. Stearns, and Brian W. Timmons

### Knowledge Translation: Tools and Resources published online: csep.ca/guidelines

<table>
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<tr>
<th>Backgrounder</th>
<th>Q &amp; A</th>
<th>Glossary of Terms</th>
<th>Media Release</th>
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*available in English only
Guidelines:

For healthy growth and development:

- Infants (aged less than 1 year) should be physically active several times daily – particularly through interactive floor-based play.

- Toddlers (aged 1–2 years) and preschoolers (aged 3–4 years) should accumulate at least 180 minutes of physical activity at any intensity spread throughout the day, including:
  - A variety of activities in different environments;
  - Activities that develop movement skills;
  - Progression toward at least 60 minutes of energetic play by 5 years of age.

- More daily physical activity provides greater benefits.
Messaging

Being active as an infant means:

- Tummy time
- Reaching for or grasping balls or other toys
- Playing or rolling on the floor
- Crawling around the home

Being active as a toddler or preschooler means:

- Any activity that gets kids moving
- Climbing stairs and moving around the home
- Playing outside and exploring their environment
- Crawling, brisk walking, running or dancing

The older children get, the more energetic play they need, such as hopping, jumping, skipping and bike riding.
Messaging

Being active can help young kids:

- Maintain a healthy body weight
- Improve movement skills
- Increase fitness
- Build healthy hearts
- Have fun and feel happy
- Develop self-confidence
- Improve learning and attention

All activity counts. Try these tips to get young kids moving:

- Create safe spaces for play.
- Play music and learn action songs together.
- Dress for the weather and explore the outdoors.
- Make time for play with other kids.
- Get where you’re going by walking or biking.
Physical Activity Guidelines

Guidelines: Clarity
524 responses – 92% agree

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Completely agree</td>
<td>63.90%</td>
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<td>Somewhat agree</td>
<td>29.54%</td>
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<td>Somewhat disagree</td>
<td>5.41%</td>
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<tr>
<td>Completely disagree</td>
<td>0.19%</td>
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Guidelines: Agreement
527 responses – 94% agree

<table>
<thead>
<tr>
<th>Agreement Level</th>
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<tbody>
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<td>Neither agree nor disagree</td>
<td>1.94%</td>
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<tr>
<td>Somewhat disagree</td>
<td>3.29%</td>
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<tr>
<td>Completely disagree</td>
<td>0.39%</td>
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Canadian Physical Activity Guidelines
Canadian Sedentary Behaviour Guidelines
Your Plan to Get Active Every Day
Future directions

- What are the best physical activity methods and measures to use for the early years?
- What is the frequency, intensity, duration and type of physical activity associated with favourable health indicators and improvements in health indicators?
- Are the relationships between physical activity and health the same for children growing up with a chronic disease or disability?
- What are the risks of physical activity during the early years?
CANADIAN SEDENTARY BEHAVIOUR GUIDELINES FOR THE EARLY YEARS

Aged 0-4 years
Sedentary behaviour is becoming an important area of study in health research. It is defined as any waking behaviour associated with an energy expenditure ≤1.5 METs and a sitting or reclining posture, and is considered separate and distinct from a lack of MVPA.

Children in the early years spend 73-84% of their waking hours being sedentary.

Young children engage in more than 1 hour per day of screen-time and are being exposed to screen-based activities before the age of 2 years.

Sedentary behaviour habits formed during the early years may track over time.
What is sedentary behaviour
Sleep is **NOT** a Sedentary Behaviour
Systematic review of sedentary behaviour and health indicators in the early years (aged 0–4 years)


Research question

What are the frequencies, interruptions, time and type of sedentary behaviour, as measured by direct and indirect methods, associated with improved health indicators in the early years?
Age groups

- Infants: 0 - 1.0 years
- Toddlers: 1.1 - 3.0 years
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- Defined collectively as “the early years”
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<td>Important</td>
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<tr>
<td>Risks (injury)</td>
<td>Critical</td>
<td>Critical</td>
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</table>
Inclusion/Exclusion Criteria for Articles

• Studies needed to include a specific measure of sedentary behaviour obtained using objective and subjective methods.
• Studies that defined sedentary as failure to meet physical activity guidelines were excluded.
• Studies that examined “active gaming” were excluded.
• Cross-sectional studies were excluded.
Records identified through database searches\(^a\) (n = 6240)

Additional records identified through other sources (n = 113)

Records after duplicates removed (n = 6365)

Records screened (n = 5265)

Full-text articles assessed for eligibility (n = 288)

Studies included in qualitative synthesis (n = 21)\(^c\)

Records excluded (n = 4977)

Full-text articles excluded, with reasons\(^b\) (n = 373)

22,417 participants
Scientific evidence

Increased television viewing is associated with unfavourable measures of:

**Infants:**
- Adiposity

**Toddlers:**
- Adiposity
- Cognitive development
- Psychosocial health

**Preschoolers:**
- Adiposity
- Cognitive development
- Psychosocial health

No specific information on the dose (i.e. frequencies, interruptions, times, or types) – many research gaps remain.
Conclusions of Systematic Review

1. Increased screen time is associated with unfavourable measures of adiposity, psychosocial health, and cognitive development.

2. Available research provides no specific information on the amount of total sedentary behaviour associated with health.

3. No evidence that there are risks associated with decreasing screen time and other sedentary behaviours.
Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0–4 years)

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Canadian Sedentary Behaviour Guidelines

FOR THE EARLY YEARS - 0 – 4 YEARS

Guidelines:

For healthy growth and development, caregivers should minimize the time infants (aged less than 1 year), toddlers (aged 1–2 years) and preschoolers (aged 3–4 years) spend being sedentary during waking hours. This includes prolonged sitting or being restrained (e.g., stroller, high chair) for more than one hour at a time.

For those under 2 years, screen time (e.g., TV, computer, electronic games) is not recommended.

For children 2–4 years, screen time should be limited to under one hour per day; less is better.
Messaging

The Lowdown on the Slowdown: what counts as being sedentary

*Sedentary behaviours* are those that involve very little physical movement while children are awake, such as sitting or reclining:

- in a stroller, high chair or car seat
- watching television
- playing with non-active electronic devices such as video games, tablets, computers or phones

Spending less time being sedentary can help young kids:

- Maintain a healthy body weight
- Develop social skills
- Behave better
- Improve learning and attention
- Improve language skills

So cut down on sitting down. To reduce young children’s sedentary time, you can:

✔ Limit use of playpens and infant seats when baby is awake.
✔ Explore and play with your child.
✔ Stop during long car trips for playtime.

✔ Set limits and have rules about screen time.
✔ Keep TVs and computers out of bedrooms.
✔ Take children outside every day.
### Sedentary Behaviour Guidelines

**Guideline: Clarity**  
601 responses – 95% agree

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Agree</th>
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<th>Neither Agree Nor Disagree</th>
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<th>Disagree</th>
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**Guideline: Agreement**  
601 responses – 92% agree

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<th>Disagree</th>
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<td>73.23%</td>
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<td>4.26%</td>
<td>0.71%</td>
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</table>
Critical Factors for Developing Healthy Active Living Behaviours in the Early Years

- adhering to physical activity and sedentary behavior guidelines
- parental and day care provider commitment to create and implement an environment that will promote structured and unstructured physical activity and limit sedentary behaviour
- ensure the physical activities are safe, varied and fun to prevent boredom
- facilitate active play designed to improve fitness and fundamental movement skills and coordination to promote mastery
Critical Factors for Developing Healthy Active Living Behaviours in the Early Years

- frequent use of positive reinforcement such as praise for all desirable activity behaviour changes
- set realistic activity goals and increase duration and type of physical activity systematically
- parents and care providers should identify and develop a plan to overcome barriers
- parents and care providers should model an active lifestyle
Summary

• Efforts to minimize screen time and time restrained while maximizing free play and outdoor time should be encouraged and policies and supports for such behaviours pursued.

• Research to challenge and further inform the existing guidelines is required.
THE POWER TO MOVE KIDS

Hope to see you in Toronto in 2014

2014 GLOBAL SUMMIT ON THE PHYSICAL ACTIVITY OF CHILDREN
Bringing together leading researchers and practitioners to address the growing childhood physical inactivity crisis

REGISTER NOW! If your work touches child and youth physical activity, SIGN UP NOW to receive your summit e-invitation and future communications on important details, at www.activehealthykids.ca/summit

Presented by Active Healthy Kids Canada, publisher of the annual Report Card on Physical Activity for Children and Youth