SUMMARY

Guideline question
What are the frequencies, interruptions, times and types of sedentary behaviour, as measured by direct and indirect methods, associated with improved health indicators (i.e. adiposity, bone and skeletal health, motor skill development, psychosocial health, cognitive development and cardio-metabolic indicators) in infants (1 month-1.0 years), toddlers (1.1-3.0 years) preschoolers (3.1-4.99 years)?

The target population
These guidelines are relevant to all apparently healthy infants (aged less than 1 year), toddlers (aged 1.1-3.0 years) and preschoolers (aged 3.1-4.99 years), irrespective of gender, race, ethnicity or socio-economic status of the family.

The target users
The intended audience for these guidelines is parents, teachers, caregivers and health care providers responsible for children in the early years.

Methods
Relevant evidence was identified by a systematic search of the following electronic bibliographic databases: Ovid MEDLINE(R) (1948 to May 11, 2011), Ovid EMBASE (1947 to 2011 May 11), and Ovid psycINFO (1806 to May Week 2 2011), EBSCO SPORTDiscus (1985-May 11, 2011) and Cochrane Central Database (up to May 2011). The six eligible health indicators were: adiposity, bone and skeletal health, psychosocial health, motor skill development, cognitive development and cardio-metabolic health indicators. This review was registered with the PROSPERO network (registration number: CRD42011001280).

Government documents were obtained through correspondence with content experts and through government websites. Bibliographies of key studies and review papers were scanned to identify further studies. Evidence presented in the systematic review was reviewed and interpreted by national and international content experts. A consensus meeting was convened to discuss and debate the information presented in the systematic review and to draft recommendations for the Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years).

External review of the draft guidelines was sought through stakeholders via an online survey. The survey was sent to health care professionals, academics, international content experts, governmental and non-governmental organizations and community members. Stakeholders were also encouraged to share the survey...
with their peers and colleagues. Feedback was provided by 932 stakeholders (858 in English and 74 in French). The Physical Activity Measurement and Guidelines Steering Committee (PAMG) re-convened to address the concerns and comments identified through the consultations and to adjust the guidelines accordingly.

Key Evidence
Key evidence to inform these guidelines comes from a systematic review examining the relationship between sedentary behaviour and 6 health indicators (adiposity, bone and skeletal health, motor skill development, psychosocial health, cognitive development, cardio-metabolic health indicators) in the early years (aged 0-4 years). This review has been submitted for publication in a peer review journal.

The preliminary search of electronic databases, reference lists, and documents provided by International consultants identified 6,353 potentially relevant articles. After de-duplication, 5,265 relevant articles remained. Of these, 21 unique, studies represented in 23 papers met the criteria for study inclusion.

In total, data from 22 417 participants were included. In brief, 9 reported results in infants, 12 in toddlers and 10 in preschoolers. Of these, included studies reported on the following health indicators: adiposity (n=11), cognitive development (n=8), psychosocial health (n=6). No included studies examined the relationship between sedentary behaviour and motor development, bone and skeletal health or cardio-metabolic health in the early years (aged 0-4 years). Some studies included results for more than one age category and were presented accordingly.

Overall, in infants, there was moderate quality evidence to suggest television viewing elicited no benefits and may be harmful to cognitive development; and low quality evidence to suggest increased television viewing was associated with unfavourable adiposity. In toddlers, there was moderate evidence suggesting television viewing has a negative impact on adiposity, moderate evidence to suggest it negatively affected psychosocial health and low quality evidence to suggest it has a negative impact on cognitive development. In preschoolers, there was low to high quality evidence on television’s negative impact on adiposity, moderate quality evidence between increased television and decreased scores on measures of psychosocial health and low quality evidence on the inverse relationship between television viewing and cognitive development (Tables 1-3).

Future Research
Areas for future research have been identified within the guidelines paper (Tremblay et al. 2012), the systematic review (LeBlanc et al. submitted) as well as through the stakeholder consultations. Despite a recent call to action by many funding bodies, the research examining sedentary behaviour in the early years is still in its infancy and there is a need for larger studies using direct and consistent measurements (i.e. larger and more diverse sample sizes, direct measures of sedentary behaviour, intent-to-treat analyses, reporting of adverse events). These larger studies should then be able to speak to the impact of dose (i.e. frequency, interruptions, times and types) of sedentary behaviour needed for good health. Future research should focus on standardizing methods for data collection and analysis and work toward implementing direct (i.e. accelerometers) and indirect (i.e. parent/caregiver or self-report questionnaires) measures of sedentary behaviour. Finally, future research needs to gain a better understanding of the long term health effects of ‘active video gaming’ (e.g., Nintendo Wii™, Microsoft Kinect™, Sony’s Playstation Move™) and the risks associated with sedentary multi-tasking (e.g., playing video games, watching television, and using a cell phone or tablet computer at the same time).

The information captured in the systematic review, supplemented by similar reviews from Australia and the United Kingdom and the input of the consensus panel, allowed the PAMG Steering Committee to develop evidence-informed guidelines on the amount of time that young children should spend sedentary. Future work needs to focus on successfully messaging strategies so this information can be effectively disseminated to the public.
GUIDELINE RECOMMENDATIONS

Preamble
These guidelines are relevant to all apparently healthy infants (aged less than 1 year), toddlers (aged 1-2 years) and preschoolers (aged 3-4 years) irrespective of gender, race, ethnicity or socio-economic status of the family. For healthy growth and development, parents and caregivers are encouraged to limit sedentary behaviours of infants, toddlers and preschoolers in the context of family, childcare, school and community.

The benefits of reduced sedentary time exceed potential risks. In particular, sedentary screen time is associated with detrimental effects on aspects of cognitive and psychosocial development and may be associated with adverse effects on body composition.

These guidelines may be appropriate for infants, toddlers and preschoolers with a disability or medical condition; however, their parents or caregivers should consult a health professional to understand the types and amounts of activities appropriate for them.

This recommendation places a high value on the harms associated with exposure to screen time, the value of having a guideline that is acceptable to parents and practitioners and the importance of avoiding screen time in the earliest years of development.

For guidance on increasing physical activity at all ages, please refer to the Canadian Physical Activity Guidelines (www.csep.ca/guidelines).

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.

Copyright
These guidelines are copyrighted by the Canadian Society for Exercise Physiology (CSEP); the guidelines herein may not be reproduced except in their entirety, without the express written permission of CSEP. CSEP reserves the right at any time, to change or revoke authorization.

Disclaimer
Care has been taken in the preparation of information contained in this document. Nonetheless, any person seeking to apply or consult these guidelines is expected to use independent judgment, or if they are not qualified to do so, to seek the advice of a qualified health professional. The Canadian Society for Exercise Physiology makes no warranties of any kind with respect to these guidelines and takes no responsibility for their application in any way. The Canadian Society for Exercise Physiology and the Healthy Active Living and Obesity Research Group (HALO) at the Children’s Hospital of Eastern Ontario Research Institute funded the development of these guidelines. The views of the funding agencies had no influence on the content or recommendations included in this document.
**Guideline Question**

What are the frequencies, interruptions, times and types of sedentary behaviour, as measured by direct and indirect methods, associated with improved health indicators (i.e. adiposity, bone and skeletal health, motor skill development, psychosocial health, cognitive development and cardio-metabolic indicators) in infants (1 month-1.0 years), toddlers (1.1-3.0 years) preschoolers (3.1-4.99 years)?

**INTRODUCTION AND BACKGROUND**

Since 1995, the Canadian Society for Exercise Physiology (CSEP) and Health Canada/Public Health Agency of Canada (PHAC) have worked together on the development of Canadian Physical Activity Guidelines to promote healthy active living in the Canadian population. This began with the publication of Canada’s Physical Activity Guide for Adults (20-55 years of age) in 1998 (Health Canada and the Canadian Society for Exercise Physiology 1998), Older Adults (>55 years of age) in 1999 (Health Canada and the Canadian Society for Exercise Physiology 1999), Children (6-9 years of age) in 2002 (Health Canada and the Canadian Society for Exercise Physiology 2002a), and Youth (10-14 years of age) in 2002 (Health Canada and the Canadian Society for Exercise Physiology 2002b). These guides have been the PHAC’s most requested resource (Tremblay et al. 2007a). In 2011, updated physical activity guidelines for children and youth, adults and older adults were released (Tremblay et al. 2011a) as well as sedentary behaviour guidelines for children and youth (Tremblay et al. 2011b); however, to date, there were still no evidence informed sedentary behaviour guidelines for the early years.

In Canada, the demand for guidance on sedentary behaviour has been apparent through stakeholder consultations by the Canadian Society for Exercise Physiology (Canadian Society for Exercise Physiology 2011) and the Public Health Agency of Canada. Further, when the Canadian Sedentary Behaviour Guidelines for Children and Youth were released in February 2011, we saw increased demand for sedentary behaviour guidelines for other age groups. In March of 2011, we embarked on a rigorous and transparent process of guideline development following the framework explained in detail by Tremblay and Haskell (Tremblay and Haskell 2012).

Separate and distinct from lack of moderate- to vigorous-intensity physical activity (i.e. not meeting specified physical activity guidelines), sedentary behaviour is defined as any waking behaviour characterized by an energy expenditure ≤1.5 METs while in a sitting or reclining posture (Sedentary Behaviour Research Network, 2012). Although people have generally thought that young children were inherently active enough, accumulating evidence suggests that sedentary lifestyles are occurring in the early years. For example, it’s been reported that children in the early years spend 73-84% of their waking hours being sedentary (Reilly et al. 2004; Vale et al. 2010). Furthermore, most young children engage in more than 1 hour per day of screen-time (Carson et al. 2010) and are being exposed to screen-based activities before the age of 2 years (Zimmerman et al. 2007).

Until recently, there has been little guidance on sedentary behaviour thresholds associated with healthy growth and development. Sedentary behaviour guidelines for young children were recently released as part of new physical activity guidelines in Australia (Australian Government Department of Health, 2010) and the U.K. (Start Active, Stay Active, 2011). Though the U.K. identified no specific cut-point for sedentary behaviour, guidelines from Australia state that screen time is not appropriate for those <2 years of age, and should be limited to <1 hour per day for those aged 2-5 years (Australian Government, Department of Health and Ageing, 2011). Similarly, the American Academy of Pediatrics discourages electronic media use in children <2 years of age and that it should be limited to <2 hours of quality educational screen time per day for children older than 2 years (American Academy of Pediatrics, 2011a; 2011b). Finally, recommendations from the Canadian Pediatric Society state that television viewing should be limited to 1 to 2 hours per day for children of all ages.
This report outlines the steps that were taken to arrive at the Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years). These guidelines are presented through a partnership between CSEP, the Healthy Active Living and Obesity Research Group (HALO) and ParticipACTION, and made available to all Canadians. The following guidelines were informed by a rigorous scientific process, and are based on a systematic review of the scientific evidence. The CSEP Physical Activity Measurement and Guideline (PAMG) Steering Committee has worked to make this process as rigorous and as transparent as possible. Additional resources related to guidelines for all ages will become available through consultation with stakeholders and the general public.

METHODS

Guideline Development

Figure 1 outlines the process that the PAMG Steering Committee has undergone to develop the sedentary behaviour guidelines. The framework to develop the Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years) was similar to that used to update the Canadian Physical Activity Guidelines for other age groups and to develop the Canadian Sedentary Behaviour Guidelines for Children and Youth (aged 5-17 years). Details on this process can be found elsewhere (Tremblay et al. 2007a, 2010b, 2011a, 2012 in press). As with the development of other Canadian guidelines, we followed the rigorous process outlined in the Appraisal of Guidelines Research and Evaluation (AGREE) II instrument. Details on the AGREE II instrument can be found elsewhere (Brouwers et al. 2010a; Brouwers et al. 2010b; Brouwers 2010c). The AGREE II instrument can be found here. The guidelines were informed by a systematic review on sedentary behaviour and health indicators in the early years (LeBlanc et al. 2012 Submitted). Evidence from the systematic review was assessed using the GRADE framework and used to help inform the appropriate wording for the proposed guidelines.

Consensus Meeting

In December 2011, the PAMG Committee convened for a 1.5 day consensus meeting where the draft guidelines were written (see participant list in Appendix A). The guideline recommendations were informed by evidence from the systematic review (described in further detail below). Participants also received background materials including documents that helped inform similar guidelines in the U.K. and Australia, Canadian sedentary behaviour guideline papers, and information explaining the GRADE and AGREE II processes. The resulting product of the consensus meeting was a preamble to explain the guidelines, followed by the guidelines themselves. After the meeting, the draft guidelines were then sent to stakeholders for comment and input.

Stakeholder Involvement

Throughout the guideline development process, there was substantial stakeholder involvement, including scientists, guideline developers, and end users. The scientific stakeholders were engaged in formulating the research questions, completing the systematic review, interpreting the evidence, drafting the guidelines, participating in the stakeholder consultation, and writing this paper. The PAMG Steering Committee also included representatives involved in the development of similar guidelines for the early years in Australia and the United Kingdom. Although neither Australia nor the United Kingdom have specific, evidence-based sedentary behaviour guidelines, they do include statements advising on levels of sedentary behaviour within their physical activity guidelines. Further, the representatives we invited from Australia and the United Kingdom have exceptional knowledge of health related behaviours in the early years.

Based on the evidence summarized in the systematic review and the draft guidelines prepared at the December 2011 consensus meeting, we also sought feedback from a wide range of stakeholders interested in sedentary behaviour and health promotion for the early years, including national and international content experts, health professionals, government and non-governmental organizations, teachers, caregivers and
parents. A list of stakeholder groups can be found in Appendix B. Stakeholders were encouraged to share the CSEP survey with their peers and colleagues to further expand the consultation base.

Consultations were completed through an on-line survey conducted in December 2011 asking 6 questions directly related to the sedentary behaviour guidelines for the early years and 6 questions directly related to physical activity guidelines for the early years. Questions asked about the wording of, and agreement with, the proposed sedentary behaviour guidelines and their associated preamble. Written comments were invited and respondents were told they would receive updated and refined guidelines when the survey process was completed. Nine-hundred and thirty-two stakeholders responded to the English (n=858) and French (n=74) surveys with 212 stakeholders providing additional written comments and suggestions. Overall, there was a high level of agreement with the draft guidelines. See details on the draft guidelines below. A summary of the survey results can be found in English here and in French here. In January 2012, the PAMG Committee reconvened to address the concerns and comments identified from the stakeholder consultations and revised the guidelines and preamble accordingly. The final guidelines are presented in this report.
**Figure 1.** Timeline and key events for developing Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years)

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOVEMBER 2006</td>
<td>CSEP think tank, Halifax, Nova Scotia</td>
</tr>
<tr>
<td>DECEMBER 2006</td>
<td>CSEP Physical Activity guidelines steering committee established</td>
</tr>
<tr>
<td>MARCH 2007</td>
<td><strong>Working research retreat, Kananaskis, Alberta</strong> 12 reviews (including one focused on early years), introduction and conclusion papers discussed</td>
</tr>
<tr>
<td>JANUARY 2009</td>
<td><strong>International consensus meeting, Kananaskis, Alberta</strong> Early Years age group (i.e., 0-4 years) identified as gap area</td>
</tr>
<tr>
<td>SEPTEMBER 2010</td>
<td>Early Years age group identified as gap area by the Public Health Agency of Canada and CSEP online and in-person stakeholder consultation</td>
</tr>
<tr>
<td>OCTOBER 2010</td>
<td>Early Years guideline working group established</td>
</tr>
<tr>
<td>MARCH 2011</td>
<td><strong>Systematic review questions established, Toronto, Ontario</strong> Healthy Active Living and Obesity Research Group (HALO) / CSEP led systematic review of sedentary behaviours and health indicators begins concurrent with systematic review on physical activity and health in the early years</td>
</tr>
<tr>
<td>DECEMBER 2011</td>
<td><strong>International consensus meeting, Toronto, Ontario</strong> Results of systematic review discussed, early years sedentary behaviour guidelines drafted; on-line stakeholder consultation on wording of draft guidelines</td>
</tr>
<tr>
<td>JANUARY 2012</td>
<td><strong>Post-stakeholder consultation and messaging meeting, Ottawa, Ontario</strong> Wording of sedentary behaviour guidelines finalized, information sheets and messaging material drafted</td>
</tr>
<tr>
<td>FEBRUARY 2012</td>
<td>Guidelines, information sheets and process papers translated to French</td>
</tr>
<tr>
<td>MARCH 2012</td>
<td><strong>Guidelines launched to Canadians</strong> Process paper published in APNM in both English and French Systematic review submitted for publication, AGREE II report published by CSEP</td>
</tr>
</tbody>
</table>
Question to be answered in the systematic review
What are the frequencies, interruptions, times and types of sedentary behaviour, as measured by direct and indirect methods, associated with improved health indicators (i.e. adiposity, bone and skeletal health, motor skill development, psychosocial health, cognitive development and cardio-metabolic indicators) in infants (1 month-1.0 years), toddlers (1.1-3.0 years) preschoolers (3.1-4.9 years)?

METHODS
Evidence Synthesis and quality assessment
The GRADE (Grading of Recommendations Assessment, Development and Evaluation) framework was used to guide our evaluation of the evidence from this systematic review including a-priori ranking of health indicators and risks of harm associated with sedentary behaviour, and quality assessment of the evidence. Included studies were divided by age group and then by health indicator. Quality of evidence for each health indicator was assessed based on study design, risk of bias, consistency of results, directness of the intervention, precision of results, and possible dose-response gradient. Details on GRADE methodology can be found elsewhere (Balshem et al. 2011; Guyatt et al. 2011a; Guyatt et al. 2011c; Guyatt et al. 2011e; Guyatt et al. 2011f; Guyatt et al. 2011d; Guyatt et al. 2011g; Guyatt et al. 2011h; Guyatt et al. 2011b).

Literature search strategy
To be included, studies were required to have a measure of sedentary behaviour as an exposure variable and at least one of six identified health indicators as an outcome of interest. The search strategy can be found in Appendix C. Both British and American spelling for measures of sedentary behaviour and measured health outcomes were searched. The six eligible health indicators and search terms (in parentheses) included in this review were:
1. Adiposity (e.g., overweight/obesity measured by body mass index (BMI), waist circumference, skinfolds, bio-impedance analysis (BIA), dual-energy x-ray absorptiometry (DXA or DEXA));
2. Bone and skeletal health (e.g., determined with measurements such as bone mineral density (BMD) or bone mass (i.e. bone mineral content (BMC)) or related measure;
3. Motor skill development (e.g., motor proficiency, gross motor skills, and/or locomotor and object control);
4. Psychosocial health (e.g., self-concept, self-esteem, emotions, happiness, social/peer interaction and acceptance, aggression and temperament);
5. Cognitive development (e.g., language development and attention);
6. Cardio-metabolic indicators (e.g., blood pressure, plasma lipids and lipoprotein concentrations (e.g. HDL-cholesterol, triglycerides), fasting glucose, insulin resistance and inflammatory markers (e.g. C-reactive protein)).

Databases searched included:
- Ovid MEDLINE(R) (1948 to May 11, 2011)
- Ovid EMBASE (1947 to 2011 May 11)
- Ovid psycINFO (1806 to May Week 2 2011)
- Cochrane Central Database (-May 2011)
Studies were included if they were published and peer reviewed, and employed one of the following designs: randomized controlled trial, quasi-experimental, prospective cohort or any study that had either a comparison group or a follow-up period. Longitudinal studies were included if the data presented in the article were consistent with established age limits (i.e., the study was required to have at least one measurement from the 0-4.99 year old period).

**Inclusion Criteria**
Using *a-priori* inclusion and exclusion criteria, authors identified potentially relevant citations by title and abstract, and retrieved full-text articles for detailed review. Studies were included only if there was a specific measure of sedentary behaviour obtained via direct (e.g., measurements of sitting, or sedentary behaviour through accelerometry or direct observation) or self-reported (e.g., television viewing, video gaming, and ‘screen time’ - composite measures of television, computers, video games) methods. Sedentary behaviour may also have been measured as a composite of total time engaged in sedentary behaviours. No language or date limits were imposed in the search; however, due to issues of feasibility, potential papers published in languages other than English or French (n= 7) were excluded.

**Study Exclusion Criteria**
Studies examining ‘active gaming’ (e.g., Nintendo Wii™, Microsoft Kinect™, Sony’s Playstation Move™, video arcades, etc.) and those that defined sedentary behaviour as ‘failing to meet physical activity guidelines’ were excluded.

**Statistical Analysis**

**Data extraction**
Standardized data extraction tables were used and information was extracted regarding study characteristics (i.e. year, study design, number of participants, age), type and measurement of sedentary behaviour, intervention and health indicators. Reviewers were not blinded to the authors or journals when extracting data.

**Risk of bias assessment**
Risk of bias assessment was completed for all included studies as part of the GRADE assessment of evidence quality. Briefly, the risk of bias assessment identifies methodological features of each study that impact our confidence in the overall estimate of effect for an outcome (e.g., allocation concealment, blinding, loss to follow-up, intention-to-treat principle (Guyatt et al. 2011h)). Due to the nature of sedentary behaviour interventions, it is very difficult to blind participants to their group allocation. Furthermore, since the majority of studies used parental or caregiver report methods for assessing sedentary time, there was some inherent self-report bias. However, if it was determined that blinding of treatment allocation or parental report was the only potential source of bias, the quality of evidence was not downgraded.

**Analysis**
By age group (i.e. infants, toddlers or preschoolers), we identified all studies contributing to each health indicator. By health indicator, meta-analysis was planned for data that were sufficiently homogeneous in terms of statistical, clinical, and methodological characteristics using Review Manager Software 5.0 (The Cochrane Collaboration, Copenhagen Denmark). Otherwise, qualitative synthesis was conducted for remaining studies. *A priori* comparisons for subgroup analysis were planned as follows: by direct (e.g., accelerometer or direct observation) and indirect (e.g., self-report, parent/teacher/caregiver proxy) measurement; by different frequencies, interruptions, times, or types of sedentary behaviour (i.e. dose of sedentary behaviour); finally, by study quality (if sufficient homogeneity existed, through risk of bias assessment).

**Harms of Decreased Sedentary Behaviour**
To ensure that both benefits and harms of interventions to decrease sedentary behaviours were considered, potential risks associated with decreased sedentary time were discussed a priori and ranked by priority by four reviewers. Musculoskeletal injury was the only risk ranked as ‘critical’ and an Ovid MEDLINE search was performed to assess the evidence. To maximize the search, all study designs were included (see search strategy in Appendix D).

RESULTS
The preliminary search of electronic databases identified 6 240 potentially relevant articles (Figure 1). Of these, 2 041 were identified in MEDLINE, 2 411 in EMBASE, 601 in psycINFO, 640 through SportDiscus, 547 through Cochrane Central Database. An additional 113 studies were identified through key informants, government documents, and bibliographies. After de-duplication, 5 265 relevant articles remained. A preliminary review of titles and abstracts resulted in 288 articles being included for detailed assessment of the full text. Of these, 21 unique studies represented in 23 papers met the criteria for study inclusion. Articles were published over a 17-year period from 1994 (DuRant et al. 1994; Guptka et al. 1994) to 2010 (Cheng et al. 2010; Foster et al. 2010; Pagani et al. 2010; Zimmerman et al. 2010). Included studies involved participants from 8 countries. Reasons for excluding studies included: ineligible age (n = 107), ineligible exposure (e.g. diet, not meeting physical activity guidelines) (n = 64), ineligible outcome (n = 29), ineligible analysis or study design (e.g. review, cross sectional analysis) (n = 173); many studies were excluded for multiple reasons. Study sample size ranged from 19 (Guptka et al. 1994) to 5493 (Reilly et al. 2005) participants.

Further details on results are outlined in the systematic review (LeBlanc et al. submitted), however the GRADE tables have been reproduced in this report (Tables 1-3). In brief, 9 reported results in infants, 12 in toddlers and 10 in preschoolers. Of these, included studies reported on the following health indicators: adiposity (n=11), cognitive development (n=8), psychosocial health (n=6). No included studies examined the relationship between sedentary behaviour and motor development, bone and skeletal health, or cardio-metabolic health in the early years (aged 0-4 years). Some studies included results for more than one age category and were presented accordingly. All studies used parental report to quantify the time children spent watching television. Due to the heterogeneity of measurements (for both sedentary exposure and health indicator), meta-analysis was not possible for any outcomes. Subgroup analysis was not possible for measurement type, dose, or study quality. Quality of evidence by age group and across outcomes can be found in Tables 1-3.

SUMMARY
Overall, in infants, there was moderate quality evidence to suggest television viewing elicited no benefits and may be harmful to cognitive development; and low quality evidence to suggest increased television viewing was associated with unfavourable adiposity. In toddlers, there was moderate evidence suggesting television viewing has a negative impact on adiposity, moderate evidence to suggest it negatively affected psychosocial health and low quality evidence to suggest it has a negative impact on cognitive development. In preschoolers, there was low to high quality evidence on television’s negative impact on adiposity, moderate quality evidence between increased television and decreased scores on measures of psychosocial health and low quality evidence on the inverse relationship between television viewing and cognitive development.
**Figure 2: Screening of potentially relevant articles**

*Databases included the following: Medline (n=2,041), Embase (n=2,411), PsycINFO (n=601), SportDiscus (n=640), Cochrane central database (n=547)*

**some full text articles were excluded for multiple reasons**

***21 unique studies, represented in 23 papers***

---

Records identified through database searching*  
(n = 6,240)  

Additional records identified through other sources  
(n = 113)  

Records after duplicates removed  
(n = 6,365)  

Records screened  
(n = 5,265)  

Records excluded  
(n = 4,977)  

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

Full-text articles excluded, with reasons*  
(n = 373)  

Studies included in qualitative synthesis  
(n = 21)***
Table 1: Is sedentary behaviour associated with poor health outcomes in infants (< 12 months)


<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>No of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>No of participants</th>
<th>Absolute effect (confidence interval, standard error)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adiposity (infants, follow-up 5 years; intervention is television viewing at ages 0-6 years; outcome is BMI)</td>
<td>1</td>
<td>Observational study</td>
<td>No serious risk of bias</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>915</td>
<td>B= 0.1(0,.2)</td>
<td>CRITICAL</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Cognitive development (infants, follow-up between 8 months and 6 years; intervention is television and other media exposure (games, videos) at 0-48 months; outcomes are receptive vocabulary, visual motor skills, cognitive, language development, attention, memory, reading and math scores)</td>
<td>7</td>
<td>Observational studies</td>
<td>No serious risk of bias</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>Dose response gradient</td>
<td>2162</td>
<td>OR=2.2 (1.2-4.1) (violent TV)</td>
<td>CRITICAL</td>
<td>IMPORTANT</td>
</tr>
</tbody>
</table>

1 Includes 1 prospective cohort study (Zimmerman 2010)
2 Each additional hour of commercial television (with advertisements) associated with an increase of 0.11 BMI z-scores, no effect seen for non-commercial television, therefore authors conclude it is the content of the television (advertising) and not the sedentary behaviour that is the cause of the increase in BMI (Zimmerman 2010).
3 Data from Alston, 2005 not presented because the analysis did not investigate the relationship between television exposure and cognitive development
4 Includes 1 case control study (Chonchaiya 2008) and 6 prospective cohort studies (Christakis 2009; Foster 2010; Schmidt 2009; Tomopoulous 2010; Zimmerman 2005; Zimmerman 2007).
5 A dose response relationship was seen for increased exposure and poorer cognitive performance in three studies (Chonchaiya 2008; Tomopoulous 2010; Zimmerman 2007).
6 Case control study(Chonchaiya 2008): n=56 (case), n=110(control)
7 Each additional hour of violent or non-violent programming associated with increased attention problems (Zimmerman 2007).
8 Adjusted odds of onset of television viewing before 12 months and exposure to 2+ hours a day for increased risk of language delay (Chonchaiya 2008)
9 Each additional hour of exposure associated with a decrease in child’s vocalization count (Christakis 2009).
10 Each hour of television viewing associated with increases on reading recognition and comprehension and memory scores respectively; no significant effect on math scores (Zimmerman 2005).
11 Adjusted log transformed coefficients for effects of media exposure at 6 months with cognitive and language development at 14 months respectively (Tomopoulous 2010).
No effect of television viewing at age 1 and attention at age 7 when covariates are controlled (Foster 2010); No effect of television exposure at 6-24 months on language and visual motor skills at 3 years, (Schmidt 2009)
Table 2: Is sedentary behaviour associated with poor health outcomes in toddlers (1.1-3.0 years)?


<table>
<thead>
<tr>
<th>No of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>No of participants</th>
<th>Absolute Estimate (confidence intervals, SE)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adiposity: (Observational) follow-up 8 months to 7.7 years; intervention is television exposure and sedentary time at 29 – 36 months; outcomes are BMI and % body fat</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Observational studies</td>
<td>No serious risk of bias</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>Dose response gradient</td>
<td>7310&lt;sup&gt;4&lt;/sup&gt;</td>
<td>B= 0.1(0,24) OR= 1.4 (1.0-1.8), 1.6 (1,2,1.1)&lt;sup&gt;5a&lt;/sup&gt; 0.8 (0.2,1.4)&lt;sup&gt;5a&lt;/sup&gt; B=2.5 (.7,4.2), 5.2 (1.2,9.1)&lt;sup&gt;5&lt;/sup&gt; B=.05 (.02)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>MODERATE</td>
<td>CRITICAL</td>
</tr>
<tr>
<td><strong>Psychosocial Health (toddlers, follow-up 1 to 8 years; intervention is television exposure at 18-48 months; outcomes are pro-social scores, victimization, emotional reactivity, antisocial behaviour, aggressive and externalizing problems)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Observational studies</td>
<td>No serious risk of bias</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>Dose response gradient</td>
<td>4707</td>
<td>Mean= 5.8(4.9,6.7) to 4.7 (4.2,5.3)&lt;sup&gt;11&lt;/sup&gt;; OR 2.0 (1.1,3.8), 1.7 (1-2.7)&lt;sup&gt;15&lt;/sup&gt;; B=0.30 (SE .01)&lt;sup&gt;13&lt;/sup&gt; B= -4.07-0.2, 1.4(8,2), 1.7(1,2)&lt;sup&gt;14&lt;/sup&gt; OR=4.1 (2.19,8.0)&lt;sup&gt;15&lt;/sup&gt;</td>
<td>MODERATE</td>
<td>CRITICAL</td>
</tr>
<tr>
<td><strong>Cognitive development (toddlers) (follow-up 1 month to 6 years; intervention is television exposure and audible television exposure at 0-48 months; outcomes are attention, vocalization, math achievement, reading recognition and comprehension, memory)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Observational studies</td>
<td>No serious risk of bias</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>6866</td>
<td>B=4.0(2-0.5)&lt;sup&gt;17&lt;/sup&gt; B= -3(0.3,0.2)&lt;sup&gt;18&lt;/sup&gt; B=0.07 (0,0.05)&lt;sup&gt;19&lt;/sup&gt; OR=2.2 (1.2,4.1) (violent TV); OR=1.7 (1.2,9) (nonviolent TV)&lt;sup&gt;20,21&lt;/sup&gt;</td>
<td>LOW</td>
<td>IMPORTANT</td>
</tr>
</tbody>
</table>

<sup>1</sup> Includes 4 prospective cohort studies (Blair 2007; Lumeng 2006; Pagani 2010; Reilly 2005).
<sup>2</sup> Dose-response between increased television viewing and BMI (Reilly 2005); hours of television watched per day and % body fat (Blair 2007); hours of television and BMI (Pagani 2010); Lumeng 2006 looked at television as dichotomous variable and did not have a dose-response relationship
<sup>3</sup> Sample size totals based on adjusted analyses
<sup>4</sup> Each additional hour of commercial television (with advertisements) associated with an increase of 0.11 BMI z-scores, no effect seen for non-commercial television, therefore authors conclude it is the content of the television (advertising) and not the sedentary behaviour that is the cause of the increase in BMI (Zimmerman 2010).
<sup>5a</sup> Odds ratio for watching 4.1-8 hrs and 8+ hrs a week respectively; <sup>5a</sup> Odds ratio for each additional hour of sedentary time (outcome is BMI) (Reilly 2005).
<sup>6</sup> Odds ratio for 1-3 hrs of television viewing and 3+ hrs (compared to <1 hour of television per day) (outcome is change in body fat) (Blair 2007).
<sup>7</sup> Standardized beta for each additional hour of television (outcome is BMI (Pagani 2010).
<sup>8</sup> No association between ≥2 hours per day of television viewing and adiposity (Lumeng 2006).  

Page 14 of 49
Includes 5 prospective cohort studies (Cheng 2010; Christakis 2007; Mistry 2007; Pagani 2010; Tomopoulous 2010).

Two of the included studies showed evidence for a dose response relationship between increased television viewing and poor measures of psychosocial health (Christakis 2007, Pagani 2010, Zimmerman 2005).

Mean scores on pro-social scale for one hour of television to >4 hours; dose response relationship (Cheng 2010).

Odds ratios for aggressive behaviour and externalizing problems on Child Behavior Checklist for a one hour increase in television viewing; no effect seen for oppositional defiant problems; effects are stronger when programming was non educational (Tomopoulos 2007).

For each additional hour of television viewing victimization score increases by 10% (Pagani 2010).

Significant effects for early exposure only for emotional reactivity, significant effects of early and sustained exposure on aggressive and externalizing behaviours respectively, no effects seen on anxious/depressed scale (Mistry 2007).

Increased odds of antisocial behaviour at 7-9 years for each additional hour of violent programming boys watched at 2-4 years; no effect seen for non-violent and educational programming, (Christakis 2007).

Includes 6 prospective cohort studies (Christakis 2007; Foster 2010; Mistry 2007; Pagani 2010; Schmidt 2009; Zimmerman 2005).

Effects of sustained exposure (30-33 months and 5.5 years) on attention scores (Mistry 2007).

Each additional hour of exposure associated with a decrease in child’s vocalization count (Christakis 2009).

Each hour of television viewing associated with a 7% decrease in classroom engagement and 6% decrease in math achievement (Pagani 2010).

Each additional hour of violent or non-violent programming associated with increased attention problems (Zimmerman 2007).

No effect on attention, Foster 2010; No effect of television exposure at 6-24 months on language and visual motor skills at 3 years (Schmidt 2009).
### Table 3: Is sedentary behaviour associated with poor health outcomes in preschool children (3.0-4.9 years)


<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>No of participants</th>
<th>Absolute Estimate (confidence intervals, SE)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adiposity preschool: (RCT) follow-up 7 weeks; intervention is 7 session (weekly for 20 min) program to reduce television viewing for children 2.5 to 5.5 years; outcomes are amount of viewing time and BMI</td>
<td>Intervention n=90 Control n=73</td>
<td>Mean difference=-21.5([-42.5,-0.5])</td>
<td>HIGH</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>Adiposity: (Observational studies) follow-up 2-7 years; intervention is sedentary behaviour, television and video exposure at ages 4-5 3-4 years 0-6 years, 4 years 3-11 years; outcomes are BMI, waist-hip ratio and skinfolds</td>
<td>None</td>
<td>3743</td>
<td>LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td></td>
<td>B=0.1(0,2)</td>
<td>Mean BMI=20.8(7.5)+hrs; 18.7(6) &lt;1.8hrs</td>
<td>3743</td>
<td>LOW</td>
</tr>
<tr>
<td></td>
<td>B=0.041 (0.017)(yr 2); B=0.044(0.017) (yr 3)</td>
<td>Mean skinfolds=104.7(8.1)+hrs; 77.9(7.2)&lt;1.8hrs</td>
<td>3743</td>
<td>LOW</td>
</tr>
<tr>
<td>Psychosocial Health (preschool, follow-up 2-7.5 years; intervention is television viewing at 2-4.5 years; outcomes are victimization, bullying and antisocial behaviour)</td>
<td>3</td>
<td>Dose response gradient</td>
<td>MODERATE</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>Cognitive development: (preschool, follow-up 1-5 years intervention television viewing at 3-5 years; outcome is attention problems, reading, math and memory scores)</td>
<td>1</td>
<td>No effect</td>
<td>LOW</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

1. Mean difference in television viewing >=2 hours per day in intervention group, BMI also decreased in intervention group, but difference was non-significant (Dennison 2004).
2. Includes 5 prospective cohort studies (DuRant 1994; Jago 2005; Proctor 2003; Zimmerman 2010); Brown 2010 was a prospective study but only presented cross-sectional analysis for the variables in question and was therefore excluded from further analysis.
3. Dose response gradient was reported in one study (Proctor 2003) but was insufficient warrant upgrading quality.
4. Each additional hour of commercial television (with advertisements) associated with an increase of 0.11 BMI z-scores, no effect seen for non-commercial television, therefore authors conclude it is the content of the television (advertising) and not the sedentary behaviour that is the cause of the increase in BMI (Zimmerman 2010).
5. Mean BMI for 3+ hours of television compared to <1.8 hours television and video viewing over the 7 years of the study; mean sum of skinfolds (mm) for 3+ hours compared to <1.8 hours over the 7 years of the study; model controlled for age, sex, baseline anthropometry and physical activity levels (Proctor 2003).
6. Increased BMI across 3 years associated with increased television viewing (hours per day) (Jago 2005).
Television viewing was not correlated with skinfolds, BMI or waist-hip ratio, although data were collected over one year and the data were collapsed so while the study design was longitudinal, the analysis was only quasi longitudinal (DuRant 1994).

Includes 3 prospective cohort studies (Christakis 2009; Pagani 2010; Zimmerman 2005).

Increased odds of antisocial behaviour at 7-9 years for each additional hour of violent programming boys watched at 2-4 years; no effect seen for non-violent and educational programming (Christakis 2007).

Increased odds of bullying at 6-11 years for each additional hour of television watched at age 4 (Zimmerman 2005)

For each hour of increased television viewing between 29 and 53 months there is a 6% increase in victimization (Pagani 2010).

Includes 1 prospective cohort study (Zimmerman 2007)

No effect of television viewing at age 4-5 on attention problems at age 9-10 years (Zimmerman 2007).
DEVELOPMENT OF GUIDELINE RECOMMENDATIONS
The development of the sedentary behaviour guidelines occurred in four steps (described in detail below):

1. A consensus meeting was convened to draft guidelines based on the information gathered in systematic review.
2. Stakeholders were surveyed through online consultations for comments and concerns.
3. A second consensus meeting was convened to discuss changes to the draft guidelines and develop methods for dissemination to the general public.
4. A messaging meeting was convened to determine the key audience for the guidelines and what key messages should be.

The Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years) are presented alongside the new Canadian Physical Activity Guidelines for the Early Years (aged 0-4 years). Details on dissemination and messaging strategies for the sedentary behaviour guidelines can be found elsewhere (Latimer et al. 2010, Rhodes et al. 2010). The PAMG project has been guided by the AGREE II framework and was assessed by two methodologists familiar with the AGREE II process; the final report and assessment can be found in Appendix E.

At both consensus meetings (i.e. to create a draft of the guidelines and then to finalize the wording of the guidelines) participants were asked to declare if they had any conflict or competing interests that may influence the development of the sedentary behaviour guidelines (“Yes, as a guideline development committee member I would like to declare that I have competing interests (i.e. to give myself a business or professional advantage) that may have influenced the development of the Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years)” OR “No, I have no competing or conflicting interests to declare.”) Declarations of conflict or competing interests can be found in Appendix A along with the list of consensus meeting participants.

1. CONSENSUS MEETING AND DRAFT GUIDELINES
In December 2011, a consensus meeting was convened to discuss and debate the information presented in the systematic review and to draft recommendations for the sedentary behaviour guidelines. Work from groups in Canada (Canadian Pediatric Society), the U.S. (American Academy of Pediatrics), the U.K. (Start Active, Stay Active), and Australia (Australian Department of Health and Ageing) were also scanned to ensure harmonization of efforts.

In addition to discussing the health benefits of sedentary behaviour, effort was made to discuss possible risks associated with decreasing sedentary time during the early years. However, when using similar search terms as those used for the health indicators, we could not find any studies that specifically examined the association between decreased sedentary behaviour and increased health risk. It was therefore the decision of the panel to suggest that the potential benefits of decreased sedentary time far exceeded the potential risks.

Based on the evidence described in the systematic reviews above, the PAMG Steering Committee, review authors, key informants, and representatives from partner organizations (i.e. CSEP, ParticipACTION, Active Healthy Kids Canada, Best Start) drafted the following recommendations:

INFANTS (aged < 1 year) and CHILDREN (aged 1-4 years)

Draft Preamble
These guidelines are relevant to all apparently healthy infants (aged <1 year) and children (aged 1-4 years) irrespective of gender, race, ethnicity or socio-economic status of the family. For healthy growth and development, parents and caregivers are encouraged to limit sedentary behaviours of infants and children in the context of family, childcare, school and community.
The benefits of reduced sedentary time exceed potential risks. In particular, sedentary screen time is associated with detrimental effects on aspects of cognitive and psychosocial development and may be associated with adverse effects on body composition.

These guidelines may be appropriate for infants and children with a disability or medical condition; however, their parents or caregiver should consult a health professional to understand the types and amounts of activities appropriate for them.

This recommendation places a high value on the harms associated with exposure to screen time, the value of having a guideline that is acceptable to parents and practitioners and the importance of avoiding screen time exposure in the earliest years of development.

For guidance on increasing physical activity at all ages, please refer to the Canadian Physical Activity Guidelines. [www.csep.ca/guidelines](http://www.csep.ca/guidelines)

**Draft Guidelines**

For healthy growth and development, caregivers should minimize the time infants (aged <1 year) and children (aged 1-4 years) spend being sedentary during waking hours. This includes prolonged sitting or being restrained for more than one hour.

For those <2 years, screen time (TV, computer, electronic games) exposure is not recommended.

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

**2. STAKEHOLDER PROCESS (External review)**

Based on the evidence presented in the systematic review and the draft recommendations presented above, feedback was sought from a wide range of stakeholders. These included national and international content experts, health professionals, governmental and non-governmental organizations, teachers, and caregivers.

Feedback was provided through an online consultation process and included respondents from every province and territory. The majority of respondents (40%) self-identified as a health professional (nurse, health promoter, dietician, physiotherapist etc.) or as an early child educator (21%). Further details can be found in the online survey results.

**Methods for external guideline review**

An online survey was sent out to stakeholders with interest in sedentary behaviour, physical activity and health promotion. A list of organizations initially contacted by CSEP can be found in Appendix B. CSEP made efforts to contact each organization and determine the best individual to receive the survey. The initial stakeholders were encouraged to share the survey link with their peers and colleagues. The survey consisted of 6 questions about the wording and level of agreement for the proposed Canadian Sedentary Behaviour Guidelines for the Early Years and the associated preamble (with an additional 6 questions directly related to the physical activity guidelines). Written comments were invited and respondents were told they would receive updated and refined guidelines when the survey process was completed. The results of the survey were reviewed by the CSEP PAMG Steering Committee.

**Stakeholder consultation process**

A total of 932 individuals (858 in English, 74 in French) completed the survey and 212 respondents provided additional written comments. Overall, the majority of respondents either ‘completely agreed’ (English: 73.2%, French: 89.5%) or ‘somewhat agreed’ (English: 25.2%, French: 15.8%) with the proposed preamble and guidelines for the early years. A summary of the survey results can be found in English [here](http://www.csep.ca/guidelines) and in French [here](http://www.csep.ca/guidelines).
The biggest concern identified from the written comments was with respect to clarity and ability for implementation of the new guidelines. There was confusion as to why those aged 2-4 years were recommended up to 1 hour screen based entertainment while those over 5 years of age were recommended up to 2 hours of screen time per day. There was also some disagreement with the term “restrained” in reference to having a child in a car seat or stroller as well as to how parents were able to keep this to less than 1 hour at a time. We have tried to clarify this in the wording and associated messaging of the final guidelines.

3. **FINALIZATION OF GUIDELINES**

In January 2012, the PAMG Steering Committee re-convened to address the concerns and comments brought up through the stakeholder consultations and to adjust the guidelines accordingly. Table 4 outlines the draft guidelines, the concerns and comments by stakeholders and how they were addressed, and the final guidelines for each age group.

<table>
<thead>
<tr>
<th>The Early Years (aged 0-4 years)</th>
<th>DISCUSSION AND COMMENTS FROM STAKEHOLDERS</th>
<th>FINAL GUIDELINE RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong>: Canadian Sedentary Behaviour Guidelines for “preschoolers”, “under 5’s”, “the early years”)</td>
<td>Preference for ‘the early years’ terminology by stakeholder consultation and to harmonize with other jurisdictions</td>
<td>Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years)</td>
</tr>
<tr>
<td>For healthy growth and development, caregivers should minimize the time infants (aged &lt;1 year) and children (aged 1-4 years) spend being sedentary during waking hours. This includes prolonged sitting or being restrained for more than one hour. For those &lt;2 years, screen time (TV, computer, electronic games) exposure is not recommended. For children 2-4 years, screen time should be limited to under an hour per day; less is better.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Concern: stakeholders did not like the ‘less than’ (&lt;) symbol. Response: the symbol was changed to text in the public facing messaging; however due to formatting constraints, was left as a symbol in scientific publications. • Concern: there needs to be more emphasis on parent/caregiver ‘modeling’. Response: the ‘how-to’s’ will be addressed in the information sheets and vignettes. • Concern: use of the term “restrained”. Response: we decided to keep this word, however will aim to clarify its use in the messaging.</td>
<td>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.</td>
</tr>
</tbody>
</table>

4. **MESSAGING MEETING**

In January 2012, shortly after the wording of the guidelines was finalized, a meeting was convened to determine the key messages and intended audience for the guidelines and associated public facing messages. This meeting included marketing and communications experts from ParticipACTION and CSEP as well as content experts focused on young child development, and those with a focus on effective messaging. The goal of this meeting was to determine a short term and a longer term plan for dissemination and implementation of the guidelines. The framework for developing messaging strategies was similar to that which was developed for
Canadian Physical Activity and Sedentary Behaviour Guidelines for other age groups and supported by peer-reviewed systematic reviews (Latimer et al. 2010, Rhodes et al. 2010). Information on materials for messaging and disseminating the guidelines will be made available on the CSEP website (www.csep.ca/guidelines).

DISSEMINATION AND IMPLEMENTATION
The work to inform the development of these guidelines is published in the peer-review literature (LeBlanc et al. (submitted) Timmons et al. 2007; Tremblay et al. 2007b, 2010, 2011, 2012 (in press)). Further, the methodological process, systematic review, and final recommendations have been and will be shared at scientific meetings and conferences.

Dissemination and implementation of these guidelines within the general public will occur through work with our partnership organizations (e.g. CSEP, ParticipACTION, Active Healthy Kids Canada) alongside the Canadian physical activity and sedentary behaviour guidelines for other age groups. Public facing messages will be created through these partnership organizations and will be developed through a similarly rigorous process as used for the development of the guidelines. This information will be updated regularly to reflect feedback from stakeholders.

The intended audience for these guidelines is parents, teachers, caregivers and health care providers responsible for children in the early years. CSEP is working to produce a variety of online and hard copy resources to be made available to all Canadians. These resources will also be distributed to partner organizations so that they are further disseminated. These resources will be created over time and updated as feedback is received from stakeholders. The primary resources will be an information sheet (i.e. what the guidelines are, health benefits of achieving guidelines and examples of ways to meet the guidelines); an online presentation; a Q&A document; and vignettes and activity log books. Additional resources will be made available in a timely manner.

Some potential barriers for decreasing sedentary behaviour include motivation to change, lifestyle habits (e.g. parents are too busy to play with children, unsafe environments), and enjoyment (i.e. those who enjoy television and electronic games); some potential facilitators include potential for long term impact, proper growth and development, improvement in lifestyle habits. For more information on messaging and behaviour modification see Latimer et al. (2010) and Rhodes et al. (2010).

SURVEILLANCE
There are a variety of mechanisms that will be used for surveillance of adherence to the new guidelines. The primary Canadian studies that will be used and their affiliated organization are as follows:
- Canadian Health Measures Survey (CHMS, Statistics Canada)
- National Longitudinal Survey of Children and Youth (NLSCY, Statistics Canada)
- Canadian Census/National Household Survey (NHS, Statistics Canada)
- National Population Health Survey (NPHS, Statistics Canada)
- Physical Activity Monitor (Canadian Fitness and Lifestyle Research Institute)

For example, the CHMS will directly measure (i.e. through accelerometry) the average amount of time young children (ages 3-4 years) will engage in physical activity and sedentary behaviour per week. This information will be used with reported screen time behaviours to determine the proportion of Canadians meeting the new guidelines. The CHMS is conducted in two year intervals and makes the information available to researchers in a timely manner. For recent, specific examples of CHMS surveillance in school aged children and youth see Colley et al. (2011). For further surveillance reports see the Active Healthy Kids Canada Report Card Report Card on Physical Activity for Children and Youth (Active Healthy Kids Canada 2005, 2006, 2007, 2008, 2009, 2010). See each survey for specific examples of monitoring tools used and relevant operational definitions.
The potential resources implications of implementing these guideline recommendations were beyond the scope of the PAMG project.

FUTURE RESEARCH
Areas for future research have been identified within the process paper, the systematic review as well as through the stakeholder consultations. Despite a recent call to action by many funding bodies, the research examining sedentary behaviour in the early years is still in its infancy and there is need for larger studies using direct and consistent measurements (i.e. larger and more diverse sample sizes, direct measures of sedentary behaviour, intent-to-treat analyses, reporting of adverse events). These larger studies should then be able to speak to the impact of dose (i.e. frequency, interruptions, time and type) of sedentary behaviour needed for good health. Finally, future research should focus on standardizing methods for data collection and analysis and work towards implementing direct (i.e. accelerometers) and indirect (i.e. questionnaires for context) measures of sedentary behaviour.

The information captured in the systematic review allowed the PAMG Steering Committee to develop evidence-informed guidelines on the amount of time that children in the early years should engage in sedentary behaviour. Future work needs to focus on successfully messaging these guidelines so this information can be effectively disseminated to the public.

UPDATING THE GUIDELINES
The PAMG Steering Committee realizes that updating the new guidelines is important and necessary to ensure that they remain true to the science that has informed them. Due to the immense amount of work required to update the systematic review, it is not feasible to update the guidelines every year. For this reason, the PAMG will work to update them in a cyclical fashion and harmonize with updating Canadian physical activity guidelines and guidelines from other jurisdictions. This means that an official update to the early year guidelines is not planned until 2016. This plan allows guidelines for each age group to be updated in a timely and efficient fashion. However, if important evidence emerges in the interim between updates, authors will work to include it in a timely fashion and the timeline for updates may change. Further, the PAMG will work with other jurisdictions for interim updates as necessary.

<table>
<thead>
<tr>
<th>Year</th>
<th>Age group to be updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Children (aged 5-11 years) and youth (aged 12-17 years) (physical activity guidelines updated and sedentary behaviour guidelines created)</td>
</tr>
<tr>
<td>2012</td>
<td>Early years (aged 0-4 years) (physical activity and sedentary behaviour guidelines created)</td>
</tr>
<tr>
<td>2013</td>
<td>Adults (aged 18-64 years) (sedentary behaviour guidelines to be created)</td>
</tr>
<tr>
<td>2014</td>
<td>Older adults (aged ≥65 years) (sedentary behaviour guidelines to be created)</td>
</tr>
<tr>
<td>2015</td>
<td>Children and Youth (updated)</td>
</tr>
<tr>
<td>2016</td>
<td>Early years (updated)</td>
</tr>
<tr>
<td>2017</td>
<td>Adults (updated)</td>
</tr>
<tr>
<td>2018</td>
<td>Older adults (updated)</td>
</tr>
<tr>
<td>2019</td>
<td>Children and Youth (updated)</td>
</tr>
<tr>
<td>2020</td>
<td>Early years (updated)</td>
</tr>
<tr>
<td>2021</td>
<td>Adults (updated)</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
</tbody>
</table>
FINAL GUIDELINES
INFANTS (aged less than 1 year) and CHILDREN (aged 1-4 years)

Preamble
These guidelines are relevant to all apparently healthy infants (aged less than 1 year), toddlers (aged 1-2 years) and preschoolers (aged 3-4 years) irrespective of gender, race, ethnicity or socio-economic status of the family. For healthy growth and development, parents and caregivers are encouraged to limit sedentary behaviours of infants, toddlers and preschoolers in the context of family, childcare, school and community.

The benefits of reduced sedentary time exceed potential risks. In particular, sedentary screen time is associated with detrimental effects on aspects of cognitive and psychosocial development and may be associated with adverse effects on body composition.

These guidelines may be appropriate for infants, toddlers and preschoolers with a disability or medical condition; however, their parents or caregivers should consult a health professional to understand the types and amounts of activities appropriate for them.

This recommendation places a high value on the harms associated with exposure to screen time, the value of having a guideline that is acceptable to parents and practitioners and the importance of avoiding screen time in the earliest years of development.

For guidance on increasing physical activity at all ages, please refer to the Canadian Physical Activity Guidelines (www.csep.ca/guidelines).

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.
**GLOSSARY**
For a list of important definitions and explanations, see [here](#).

**LIST OF ABBREVIATIONS**
The following is a list of common abbreviations used throughout this document.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHKC</td>
<td>Active Healthy Kids Canada</td>
</tr>
<tr>
<td>CAN PLAY</td>
<td>Physical Activity Levels Among Youth</td>
</tr>
<tr>
<td>CCHS</td>
<td>Canadian Community Health Survey</td>
</tr>
<tr>
<td>CFLRI</td>
<td>Canadian Fitness and Lifestyle Research Institute</td>
</tr>
<tr>
<td>CHMS</td>
<td>Canadian Health Measures Survey</td>
</tr>
<tr>
<td>CSEP</td>
<td>Canadian Society for Exercise Physiology</td>
</tr>
<tr>
<td>HALO</td>
<td>Healthy Active Living and Obesity research group</td>
</tr>
<tr>
<td>NLSCY</td>
<td>National Longitudinal Survey of Children and Youth</td>
</tr>
<tr>
<td>PAM</td>
<td>Physical Activity Monitor</td>
</tr>
<tr>
<td>PAMG</td>
<td>Physical Activity Measurement and Guidelines project</td>
</tr>
<tr>
<td>PHAC</td>
<td>Public Health Agency of Canada</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
REFERENCES


Active Healthy Kids Canada. Active kids are fit to learn - Report Card on Physical Activity for Children and Youth. Active Healthy Kids Canada, 2009. Toronto, Active Healthy Kids Canada.


### Appendix A: Meeting participants and members of the early years guideline steering committee

<table>
<thead>
<tr>
<th>Panel Member</th>
<th>Affiliation</th>
<th>Role</th>
<th>Conflict of interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Tremblay, PhD</td>
<td>Director, Healthy Active Living and Obesity Research Group, Children’s Hospital of Eastern Ontario (Canada)</td>
<td>Chair, content expert</td>
<td>None</td>
</tr>
<tr>
<td>Allana LeBlanc</td>
<td>Healthy Active Living and Obesity Research Group, Children’s Hospital of Eastern Ontario (Canada)</td>
<td>Systematic review project manager</td>
<td>None</td>
</tr>
<tr>
<td>Ian Janssen, PhD</td>
<td>School of Kinesiology and Health Studies and Department of Community Health and Epidemiology, Queen’s University (Canada)</td>
<td>Co-Investigator, content expert</td>
<td>None</td>
</tr>
<tr>
<td>Brian Timmons, PhD</td>
<td>Child Health &amp; Exercise Medicine Program, McMaster University (Canada)</td>
<td>Co-Investigator, content expert</td>
<td>None</td>
</tr>
<tr>
<td>John Spence, PhD</td>
<td>Faculty of Physical Education and Recreation, University of Alberta (Canada)</td>
<td>Co-Investigator, content expert</td>
<td>None</td>
</tr>
<tr>
<td>Val Carson, PhD(c)</td>
<td>School of Kinesiology and Health, Queen’s University (Canada)</td>
<td>Systematic review author</td>
<td>None</td>
</tr>
<tr>
<td>Jodie Stearns</td>
<td>Faculty of Physical Education and Recreation, University of Alberta (Canada)</td>
<td>Systematic review author</td>
<td>None</td>
</tr>
<tr>
<td>Carrie Dillman, PT</td>
<td>Child Health &amp; Exercise Medicine Program, McMaster University (Canada)</td>
<td>Systematic review author</td>
<td>None</td>
</tr>
<tr>
<td>Sarah Conor Gorber, PhD</td>
<td>Public Health Agency of Canada (Canada)</td>
<td>Methodological expert</td>
<td>None</td>
</tr>
<tr>
<td>Michelle Kho, PT, PhD</td>
<td>Department of Physical Medicine &amp; Rehabilitation, Johns Hopkins University (U.S.A.)</td>
<td>Methodological expert</td>
<td>None</td>
</tr>
<tr>
<td>Amy Latimer, PhD</td>
<td>School of Kinesiology and Health, Queen’s University (Canada)</td>
<td>Dissemination and messaging expert</td>
<td>None</td>
</tr>
<tr>
<td>Tone Okely, PhD</td>
<td>Director of the Interdisciplinary Educational Research Institute, University of Wollongong (Australia)</td>
<td>Collaborator, external reviewer</td>
<td>None</td>
</tr>
<tr>
<td>John Reilly, PhD</td>
<td>Royal Hospital for Sick Children (Scotland)</td>
<td>Collaborator, external reviewer</td>
<td>None</td>
</tr>
<tr>
<td>Claire LeBlanc, MD</td>
<td>Canadian Pediatric Society (Canada)</td>
<td>Medical representative</td>
<td>None</td>
</tr>
<tr>
<td>Mary Jane Gordon</td>
<td>Kingston, Frontenac and Lennox &amp; Addington Public Health (Canada)</td>
<td>Public health nurse and stakeholder representative</td>
<td>None</td>
</tr>
<tr>
<td>Louise Choquette</td>
<td>Best Start Resource Centre, a key program of Health Nexus (Canada)</td>
<td>Community and stakeholder representative</td>
<td>None</td>
</tr>
<tr>
<td>Mary Duggan</td>
<td>Canadian Society for Exercise Physiology (Canada)</td>
<td>Knowledge user</td>
<td>None</td>
</tr>
<tr>
<td>Audrey Hicks, PhD</td>
<td>Canadian Society for Exercise Physiology (Canada)</td>
<td>Knowledge user</td>
<td>None</td>
</tr>
<tr>
<td>Kelly Murumets</td>
<td>President and CEO, ParticipACTION (Canada)</td>
<td>Knowledge user</td>
<td>None</td>
</tr>
</tbody>
</table>
APPENDIX B: List of organizations initially contacted for stakeholder consultation

Active Healthy Kids Canada
Active Living Alliance for Canadians with a Disability
Active Living Coalition for Older Adults
Alberta Centre for Active Living
Alberta Health Services
Alberta Recreation and Parks Association
Alzheimer Society of Canada
Arctic Health Research Network - Yukon
Asthma Society of Canada
Autism Society of Canada
BC Coalition of People with Disabilities
Be Fit For Life Centre, University of Calgary
Best Start
Boys and Girls Clubs - Alberta
Boys and Girls Clubs - Ontario
Boys and Girls Clubs of Canada
Canada Safety Council
Canadian Academy of Sport Medicine
Canadian Association for Community Living
Canadian Association for School Health
Canadian Association for the Advancement of Women in Sport and Physical Activity
Canadian Association of Cardiac Rehabilitation
Canadian Association of Family Resource Programs
Canadian Association of Gerontology
Canadian Association of Occupational Therapists
Canadian Association of Principals
Canadian Association of Retired Persons (CARP)
Canadian Association of Social Workers
Canadian Athletic Therapists Association
Canadian Cancer Society
Canadian Centre for Activity and Aging
Canadian Centre for Stress and Well-Being
Canadian Child Care Federation
Canadian Chiropractic Association
Canadian Diabetes Association
Canadian Ethnocultural Council
Canadian Fitness and Lifestyle Research Institute
Canadian Forces Personnel Support Agency
Canadian Healthcare Association
Canadian Home and School Federation
Canadian Home Care Association
Canadian Institute of Child Health
Canadian Institute of Planners
Canadian Intramural Recreation Association
Canadian Labour Congress
Canadian Medical Association
Canadian MedicAlert Foundation
Canadian Mental Health Association
Canadian Network for Leadership in Education and Early Learning & Care
Canadian Nurses Association
Canadian Organization for Rare Disorders
Canadian Orthopaedic Foundation
Canadian Paediatric Society
Canadian Parks and Recreation Association
Canadian Physiotherapy Association
Canadian Public Health Association
Canadian Red Cross
Canadian Senior Games Association
Canadian Sport Massage Therapist Association
Canadian Teachers Federation
Centre for Education and Research on Aging and Health
Children's Hospital of Eastern Ontario
Coalition for Active Living
College of Physicians and Surgeons of Ontario
Conseil communauté en santé du Manitoba
Conseil scolaire acadien provincial
Culture, Heritage, Tourism and Sport, Government of Manitoba
Dept of Tourism, Culture and Recreation - Government of Newfoundland and Labrador
Dept of Tourism, Parks and Recreation - Government of Alberta
Dept. of Community Services, Sport and Recreation Branch - Government of Yukon
Dept. of Culture, Language, Elders and Youth - Government of Nunavut
Dept. of Culture, Language, Elders and Youth - Government of Nunavut
Dept. of Education - Government of Newfoundland and Labrador
Dept. of Health and Community Services - Government of Newfoundland and Labrador
Dept. of Health and Wellness - Government of Prince Edward Island
Dept. of Health Promotion & Protection - Government of Nova Scotia
Dept. of Human Resources, Labour and Employment - Government of Newfoundland and Labrador
Dept. of Municipal and Community Affairs, Sport, Recreation, Youth and Volunteerism - Government of Northwest Territories
Dept. of Municipal and Community Affairs, Sport, Recreation, Youth and Volunteerism - Government of Northwest Territories
Dept. of Wellness, Culture and Sport, Government of New Brunswick
Dietitians of Canada
Doctors Nova Scotia
Early Childhood Development Intercultural Partnership
Eastern Health
Ever Active Schools (Alberta)
Faculty of Physical Education and Recreation - University of Alberta
First Nations Child and Family Caring Society
Focus on Fathers Program - Catholic Community Services of York Region
Fondation Lucie et André Chagnon
Girl Guides of Canada
Healthy Indoors Partnership
Healthy Start for Mom and Me
High Five Program, Parks and Recreation Ontario
Hospital for Sick Children
Industrial Accident Prevention Association
Institut Pacific
Institute of Musculoskeletal Health and Arthritis, Canadian Institutes of Health Research
Invest in Kids
IWK Health Centre
Joint Consortium for School Health
Lawson Health Research Institute
Lets Go Green Canada
March of Dimes
Mi’kmaw Kina’matnewey, Nova Scotia
Ministry of Children and Youth Services - Government of Ontario
Ministry of Education - Government of Ontario
Ministry of Health Promotion - Government of Ontario
Ministry of Tourism, Parks, Culture and Sport - Government of Saskatchewan
Moncton Headstart
National Aboriginal Diabetes Association
National Aboriginal Health Association
National Association of Federal Retirees
National Association of Friendship Centres
National Indian & Inuit Community Health Representatives Organization
National Pensioners and Senior Citizens Federation
New Brunswick Gymnastics Association
New Brunswick Lung Association
Older Adults Centres' Association of Ontario
One Voice, The Canadian Seniors Network
Ontario Public Health Association
Osteoporosis Canada
Pan-Canadian Public Health Network
Parkgate Community Services
Parks and Recreation Ontario
ParticipACTION
Physical Activity Coordinator, Richmond County, Nova Scotia
Physical and Health Education Canada
Physical Literacy Wapiti Project - Saskatchewan
Psychologists Association of Alberta
Recreation and Parks Association of the Yukon
Recreation Connections Manitoba
Recreation Newfoundland and Labrador
Recreation Newfoundland and Labrador
Recreation Nova Scotia
Registered Nurses Association of Ontario
Reh-Fit Centre
Right to Play Canada
Road Scholar (Elderhostel Inc)
Royal College of Physicians and Surgeons of Canada
Safe Kids Canada
Saskatchewan Parks and Recreation Association
Saskatchewan Seniors Mechanism
Scouts Canada
SmartRisk
Society of Obstetricians and Gynaecologists of Canada
Special Olympics Canada
Stanton Territorial Health Authority
The Arthritis Society
The Canadian Association of Naturopathic Doctors
The Canadian Centre for Occupational Health & Safety
The Canadian National Institute for the Blind
The College of Family Physicians of Canada
The Federation of Canadian Municipalities
The Heart and Stroke Foundation of Canada
The Lung Association
The Royal Canadian Legion
The Salvation Army
UNICEF Canada
United Way of Canada
Victorian Order of Nurses for Canada
Yellowknife Family Centre
YMCA Canada
YMCA Fitness / YMCA Calgary
YMCA Ontario
YWCA Canada
APPENDIX C: Search Strategy for health indicators and sedentary behaviour

<table>
<thead>
<tr>
<th>#</th>
<th>Searches MEDLINE</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>exp obesity/</td>
<td>108359</td>
</tr>
<tr>
<td>2</td>
<td>(obesity* or obese).tw.</td>
<td>124960</td>
</tr>
<tr>
<td>3</td>
<td>exp overweight/</td>
<td>108924</td>
</tr>
<tr>
<td>4</td>
<td>(overweight or over-weight).tw.</td>
<td>25457</td>
</tr>
<tr>
<td>5</td>
<td>exp body fat distribution/</td>
<td>3386</td>
</tr>
<tr>
<td>6</td>
<td>exp body composition/</td>
<td>29155</td>
</tr>
<tr>
<td>7</td>
<td>waist circumference/</td>
<td>1765</td>
</tr>
<tr>
<td>8</td>
<td>skinfold thickness/ or (skin fold* or skinfold*).tw.</td>
<td>10083</td>
</tr>
<tr>
<td>9</td>
<td>(body composition* or BMI or body mass index).tw.</td>
<td>101193</td>
</tr>
<tr>
<td>10</td>
<td>exp &quot;body weights and measures&quot;/</td>
<td>364803</td>
</tr>
<tr>
<td>11</td>
<td>(bio-impedance analysis or BIA).tw.</td>
<td>1451</td>
</tr>
<tr>
<td>12</td>
<td>absorptiometry, photon/</td>
<td>13882</td>
</tr>
<tr>
<td>13</td>
<td>(absorptiometry or densitometry or photodensitometry or DXA or DEXA).tw.</td>
<td>14714</td>
</tr>
<tr>
<td>14</td>
<td>exp bone/</td>
<td>426975</td>
</tr>
<tr>
<td>15</td>
<td>bone tissue.tw.</td>
<td>8146</td>
</tr>
<tr>
<td>16</td>
<td>Bone density/</td>
<td>33356</td>
</tr>
<tr>
<td>17</td>
<td>Bone development/</td>
<td>10846</td>
</tr>
<tr>
<td>18</td>
<td>Osteogenesis/</td>
<td>15524</td>
</tr>
<tr>
<td>19</td>
<td>insulin resistance/</td>
<td>29282</td>
</tr>
<tr>
<td>20</td>
<td>(metabolic cardiovascular syndrome or metabolic syndrome or syndrome x).tw.</td>
<td>18927</td>
</tr>
<tr>
<td>21</td>
<td>((cardiovascular or heart or vascular) adj2 risk$).tw.</td>
<td>50862</td>
</tr>
<tr>
<td>22</td>
<td>exp hypertension/</td>
<td>188648</td>
</tr>
<tr>
<td>23</td>
<td>exp blood pressure determination/ or exp blood pressure monitoring, ambulatory/ or exp blood/</td>
<td>869989</td>
</tr>
<tr>
<td>24</td>
<td>exp blood pressure/</td>
<td>225909</td>
</tr>
<tr>
<td>25</td>
<td>exp blood glucose/ or exp diabetes mellitus, type 2/</td>
<td>161720</td>
</tr>
<tr>
<td>26</td>
<td>exp glucose intolerance/ or glucose tolerance test/</td>
<td>28896</td>
</tr>
<tr>
<td>27</td>
<td>Motor activity/</td>
<td>62440</td>
</tr>
<tr>
<td>28</td>
<td>Psychomotor performance/</td>
<td>39590</td>
</tr>
<tr>
<td>29</td>
<td>Child development/</td>
<td>29819</td>
</tr>
<tr>
<td>30</td>
<td>gross motor skill*.tw.</td>
<td>231</td>
</tr>
<tr>
<td>31</td>
<td>cognitive development.tw.</td>
<td>2610</td>
</tr>
<tr>
<td>32</td>
<td>&quot;growth and development&quot;/</td>
<td>592</td>
</tr>
<tr>
<td>33</td>
<td>Attention/</td>
<td>49095</td>
</tr>
<tr>
<td>34</td>
<td>Self efficacy/</td>
<td>8709</td>
</tr>
<tr>
<td>35</td>
<td>Self concept/</td>
<td>39299</td>
</tr>
</tbody>
</table>
Child behavior disorder/ 16729
(pro-social behav* or prosocial behav* or pro social behav*).tw. 621
exp social behavior/ 131753
Aggression/ 23466
Temperament/ 3431
Social adjustment/ 19400
sedentar*.tw. 13068
sedentary lifestyle/ 561
((chair or sitting or car or automobile or auto or bus of indoor or in-door or screen or computer) adj time).tw. 665
low energy expenditure.tw. 81
(computer game* or video game* or ((television adj watch*) or tv watch*)).tw. 1638
television/ 10267
computer/ 47199
"video games"/ 1140
(screen based entertainment of screen-based entertainment or screen time).tw. 176
physical inactivit*.tw. 2728
sitting.tw. 12103
or/1-13 473403
or/13-18 463899
or/19-26 1415972
or/27-30 127983
or/31-33 52179
or/34-41 186640
or/42-52 86430
or/52-58 2537973
59 and 60 27623
limit 61 to ("infant (1 to 23 months)" or "preschool child (2 to 5 years)") 1632
(infant* or preschool* or child* or pediatric* or paediatric*).tw. 1095855
61 and 63 3534
62 or 64 3901
cohort studie/ or comparative studies/ or follow-up studies/ or prospective studies/ or risk factors/ or cohort.mp. or compared.mp. or groups.mp. or multivariate.mp. 4363964
limit 65 to randomized controlled trial 200
66 65 and 66 1990
67 67 or 68 2041
<table>
<thead>
<tr>
<th>#</th>
<th>Searches - EMBASE</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>sedentar*.tw.</td>
<td>15777</td>
</tr>
<tr>
<td>2</td>
<td>(chair or sitting or car or automobile or auto or bus of indoor or in-door or screen or computer) adj time).tw.</td>
<td>767</td>
</tr>
<tr>
<td>3</td>
<td>low energy expenditure.tw.</td>
<td>113</td>
</tr>
<tr>
<td>4</td>
<td>(computer game* or video game*).tw.</td>
<td>1579</td>
</tr>
<tr>
<td>5</td>
<td>((television adj watch*) or tv watch*).tw.</td>
<td>387</td>
</tr>
<tr>
<td>6</td>
<td>(screen based entertainment of screen-based entertainment or screen time).tw.</td>
<td>188</td>
</tr>
<tr>
<td>7</td>
<td>television viewing/ or computer/ or recreation/</td>
<td>75882</td>
</tr>
<tr>
<td>8</td>
<td>sitting.tw.</td>
<td>16870</td>
</tr>
<tr>
<td>9</td>
<td>bed rest.mp.</td>
<td>8763</td>
</tr>
<tr>
<td>10</td>
<td>physical inactivit*.tw.</td>
<td>3272</td>
</tr>
<tr>
<td>11</td>
<td>exp obesity/</td>
<td>200669</td>
</tr>
<tr>
<td>12</td>
<td>(obesit* or obese).tw.</td>
<td>160951</td>
</tr>
<tr>
<td>13</td>
<td>exp overweight/</td>
<td>200669</td>
</tr>
<tr>
<td>14</td>
<td>(overweight or over-weight).tw.</td>
<td>32825</td>
</tr>
<tr>
<td>15</td>
<td>exp body fat distribution/</td>
<td>2386</td>
</tr>
<tr>
<td>16</td>
<td>exp body composition/</td>
<td>49106</td>
</tr>
<tr>
<td>17</td>
<td>waist circumference/</td>
<td>10513</td>
</tr>
<tr>
<td>18</td>
<td>skinfold thickness/ or (skin fold* or skinfold*).tw.</td>
<td>12753</td>
</tr>
<tr>
<td>19</td>
<td>(body composition* or BMI or body mass index).tw.</td>
<td>128737</td>
</tr>
<tr>
<td>20</td>
<td>exp &quot;body weights and measures&quot;/</td>
<td>80448</td>
</tr>
<tr>
<td>21</td>
<td>(bio-impedance analysis or BIA).tw.</td>
<td>1873</td>
</tr>
<tr>
<td>22</td>
<td>absorptiometry, photon/</td>
<td>2299</td>
</tr>
<tr>
<td>23</td>
<td>(absorptiometry or densitometry or photodensitometry or DXA or DEXA).tw.</td>
<td>19353</td>
</tr>
<tr>
<td>24</td>
<td>exp bone/</td>
<td>573698</td>
</tr>
<tr>
<td>25</td>
<td>bone tissue.tw.</td>
<td>10930</td>
</tr>
<tr>
<td>26</td>
<td>Bone density/</td>
<td>42908</td>
</tr>
<tr>
<td>27</td>
<td>Bone development/</td>
<td>23309</td>
</tr>
<tr>
<td>28</td>
<td>Osteogenesis/</td>
<td>23309</td>
</tr>
<tr>
<td>29</td>
<td>insulin resistance/</td>
<td>53088</td>
</tr>
<tr>
<td>30</td>
<td>(metabolic cardiovascular syndrome or metabolic syndrome or syndrome x).tw.</td>
<td>25900</td>
</tr>
<tr>
<td>31</td>
<td>((cardiovascular or heart or vascular) adj2 risk$).tw.</td>
<td>65751</td>
</tr>
<tr>
<td>32</td>
<td>exp hypertension/</td>
<td>404947</td>
</tr>
<tr>
<td>33</td>
<td>exp blood pressure determination/ or exp blood pressure monitoring, ambulatory/ or exp blood/</td>
<td>1759587</td>
</tr>
<tr>
<td>34</td>
<td>exp blood pressure/</td>
<td>354453</td>
</tr>
</tbody>
</table>
35 exp blood glucose/ or exp diabetes mellitus, type 2/ 209678
36 exp glucose intolerance/ or glucose tolerance test/ 29889
37 Motor activity/ 34369
38 Psychomotor performance/ 13923
39 Child development/ 33323
40 gross motor skill*.tw. 316
41 cognitive development.tw. 3174
42 "growth and development"/ 149125
43 Attention/ 43954
44 Self efficacy/ 47142
45 Self concept/ 47142
46 Child behavior disorder/ 37318
47 (pro-social behav* or prosocial behav* or pro social behav*).tw. 734
48 exp social behavior/ 907085
49 Aggression/ 36353
50 Temperament/ 4791
51 Social adjustment/ 17564
52 or/1-10 120734
53 or/11-23 426167
54 or/23-28 623033
55 or/29-36 2535536
56 or/37-40 80442
57 or/41-43 196037
58 or/44-51 983554
59 or/53-58 4512051
60 52 and 59 34203
61 (infant* or preschool* or child* or pediatric* or paediatric*).tw. 1467934
62 limit 60 to preschool child <1 to 6 years> 1517
63 randomly.ab. 195183
64 trial.ti. 122282
65 randomized.ab. 269996
66 63 or 64 or 65 515782
67 cohort studies/ or comparative studies/ or follow-up studies/ or prospective studies/ or risk factors/ or cohort.mp. or compared.mp. or groups.mp. or multivariate.mp. 4519589
68 66 or 67 4714508
69 limit 62 to (clinical trial or randomized controlled trial or controlled clinical trial) 78
70 62 and 68 583
<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
<th>Results</th>
<th>Search Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>sedentary.tw.</td>
<td>2501</td>
<td>Advanced</td>
</tr>
<tr>
<td>2</td>
<td>((chair or sitting or car or automobile or auto or bus of indoor or in-door or screen or computer) adj time).tw.</td>
<td>173</td>
<td>Advanced</td>
</tr>
<tr>
<td>3</td>
<td>(computer game* or video game*).tw.</td>
<td>2555</td>
<td>Advanced</td>
</tr>
<tr>
<td>4</td>
<td>((television adj watch*) or tv watch*).tw.</td>
<td>317</td>
<td>Advanced</td>
</tr>
<tr>
<td>5</td>
<td>(screen based entertainment of screen-based entertainment or screen time).tw.</td>
<td>83</td>
<td>Advanced</td>
</tr>
<tr>
<td>6</td>
<td>television viewing/ or computer/ or computer games/</td>
<td>5173</td>
<td>Advanced</td>
</tr>
<tr>
<td>7</td>
<td>physical inactivity.tw.</td>
<td>651</td>
<td>Advanced</td>
</tr>
<tr>
<td>8</td>
<td>bed rest.tw.</td>
<td>213</td>
<td>Advanced</td>
</tr>
<tr>
<td>9</td>
<td>sitting.tw.</td>
<td>2682</td>
<td>Advanced</td>
</tr>
<tr>
<td>10</td>
<td>low energy expenditure.tw.</td>
<td>8</td>
<td>Advanced</td>
</tr>
<tr>
<td>11</td>
<td>exp obesity/</td>
<td>11022</td>
<td>Advanced</td>
</tr>
<tr>
<td>12</td>
<td>(obesity* or obese).tw.</td>
<td>15967</td>
<td>Advanced</td>
</tr>
<tr>
<td>13</td>
<td>exp overweight/</td>
<td>11501</td>
<td>Advanced</td>
</tr>
<tr>
<td>14</td>
<td>(overweight or over-weight).tw.</td>
<td>6087</td>
<td>Advanced</td>
</tr>
<tr>
<td>15</td>
<td>body fat/</td>
<td>232</td>
<td>Advanced</td>
</tr>
<tr>
<td>16</td>
<td>body weight/</td>
<td>8828</td>
<td>Advanced</td>
</tr>
<tr>
<td>17</td>
<td>waist circumference.tw.</td>
<td>707</td>
<td>Advanced</td>
</tr>
<tr>
<td>18</td>
<td>skinfold/</td>
<td>0</td>
<td>Advanced</td>
</tr>
<tr>
<td>19</td>
<td>(body composition* or BMI or body mass index).tw.</td>
<td>9956</td>
<td>Advanced</td>
</tr>
<tr>
<td>20</td>
<td>(bio-impedance analysis or BIA).tw.</td>
<td>110</td>
<td>Advanced</td>
</tr>
<tr>
<td>21</td>
<td>(absorptiometery or densitometry or photodensitometry or DXA or DEXA).tw.</td>
<td>291</td>
<td>Advanced</td>
</tr>
<tr>
<td>22</td>
<td>bones/</td>
<td>824</td>
<td>Advanced</td>
</tr>
<tr>
<td>23</td>
<td>bone tissue.tw.</td>
<td>26</td>
<td>Advanced</td>
</tr>
<tr>
<td>24</td>
<td>bone disorders/</td>
<td>276</td>
<td>Advanced</td>
</tr>
<tr>
<td>25</td>
<td>insulin resistance/</td>
<td>632</td>
<td>Advanced</td>
</tr>
<tr>
<td>26</td>
<td>(metabolic cardiovascular syndrome or metabolic syndrome or syndrome x).tw.</td>
<td>1081</td>
<td>Advanced</td>
</tr>
<tr>
<td>27</td>
<td>((cardiovascular or heart or vascular) adj3 risk$).tw.</td>
<td>4471</td>
<td>Advanced</td>
</tr>
<tr>
<td>28</td>
<td>exp hypertension/</td>
<td>4368</td>
<td>Advanced</td>
</tr>
<tr>
<td>29</td>
<td>exp blood pressure determination/ or exp blood pressure monitoring, ambulatory/ or exp blood/</td>
<td>10763</td>
<td>Advanced</td>
</tr>
<tr>
<td>30</td>
<td>exp blood pressure/</td>
<td>5083</td>
<td>Advanced</td>
</tr>
<tr>
<td>31</td>
<td>diabetes mellitus/ or glucose/</td>
<td>4868</td>
<td>Advanced</td>
</tr>
<tr>
<td>32</td>
<td>exp motor development/</td>
<td>6464</td>
<td>Advanced</td>
</tr>
<tr>
<td>33</td>
<td>exp motor performance/</td>
<td>11496</td>
<td>Advanced</td>
</tr>
</tbody>
</table>
34 Motor skills/ or Gross motor skill learning/ 2954 Advanced
35 exp attention/ 40650 Advanced
36 Self efficacy/ 11311 Advanced
37 Self concept/ 32664 Advanced
38 social behavior/ 12223 Advanced
39 aggressive behavior/ or child attitudes/ 22811 Advanced
40 personality/ 21089 Advanced
41 Social adjustment/ 8280 Advanced
42 language development/ 18521 Advanced
43 or/1-10 12206 Advanced
44 or/11-21 29555 Advanced
45 or/21-24 1308 Advanced
46 or/25-31 28034 Advanced
47 or/32-34 19941 Advanced
48 or/36-41 105011 Advanced
49 (infant* or preschool* or child* or pediatric* or paediatric*).tw. 499808 Advanced
50 childhood play development/ 996 Advanced
51 behavior problems/ 20432 Advanced
52 35 or 42 or 50 or 51 79791 Advanced
53 44 or 45 or 46 or 47 or 48 or 52 252956 Advanced
54 44 and 53 29555 Advanced
55 49 and 54 5563 Advanced
56 limit 54 to (140 infancy <age 2 to 23 mo> or 160 preschool age <age 2 to 5 yrs>) 1056 Advanced
57 55 or 56 5640 Advanced
58 cohort studies/ or comparative studies/ or follow-up studies/ or prospective studies/ or risk factors/ or cohort.mp. or compared.mp. or groups.mp. or multivariate.mp. 568901 Advanced
59 limit 57 to ("0430 followup study" or "0450 longitudinal study" or "2000 treatment outcome/randomized clinical trial") 742 Advanced
60 57 and 58 2101 Advanced
61 59 or 60 2411 Advanced
<table>
<thead>
<tr>
<th>#</th>
<th>Query - SPORTDiscus</th>
</tr>
</thead>
<tbody>
<tr>
<td>S12</td>
<td>S9 and S10 and S11</td>
</tr>
<tr>
<td>S11</td>
<td>sedentary or sitting or low energy expenditure or computer games or television or physical inactivity</td>
</tr>
<tr>
<td>S10</td>
<td>(S2 or S3 or S4 or S5 or S6 or S7)</td>
</tr>
<tr>
<td>S9</td>
<td>case control study or cohort analysis or compared or multivariate or randomized controlled trial or longitudinal or follow up</td>
</tr>
<tr>
<td>S8</td>
<td>children or preschool or infant or pediatric or peadiatric</td>
</tr>
<tr>
<td>S7</td>
<td>self efficacy or self esteem or self concept or pro social behaviour or aggression or temperament or social adjustment</td>
</tr>
<tr>
<td>S6</td>
<td>cognitive development or attention or language development</td>
</tr>
<tr>
<td>S5</td>
<td>motor activity or gross motor skill or motor development or object control or child development or (growth and development)</td>
</tr>
<tr>
<td>S4</td>
<td>insulin resistance or metabolic syndrome or hypertension or blood pressure or blood glucose or glucose intolerance</td>
</tr>
<tr>
<td>S3</td>
<td>bone or bone density or bone development or osteogenesis</td>
</tr>
<tr>
<td>S2</td>
<td>obesity or obese or overweight or body fat or waist circumference or skinfold or (DXA or DEXA)</td>
</tr>
<tr>
<td>S1</td>
<td>motor activity or physical activity or exercise or play</td>
</tr>
</tbody>
</table>
### Preschool SB_May10: HALO

<table>
<thead>
<tr>
<th>ID</th>
<th>Search</th>
<th>Hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>(sedentar*)</td>
<td>547</td>
</tr>
<tr>
<td>#2</td>
<td>((chair OR sitting OR car OR automobile OR auto OR bus OR indoor OR in-door OR screen OR computer) ADJ time)</td>
<td>1023</td>
</tr>
<tr>
<td>#3</td>
<td>(television OR tv)</td>
<td>1377</td>
</tr>
<tr>
<td>#4</td>
<td>(computer games OR video games)</td>
<td>294</td>
</tr>
<tr>
<td>#5</td>
<td>(physical inactivit* OR bed rest OR sitting)</td>
<td>4074</td>
</tr>
<tr>
<td>#6</td>
<td>(#1 OR #2 OR #3 OR #4 OR #5)</td>
<td>7964</td>
</tr>
<tr>
<td>#7</td>
<td>(obesit* OR obese OR overweight OR over-weight OR body composition OR body fat OR waist circumference OR bio-impedance analysis OR BIA OR absorptiometry OR DXA OR DEXA OR body mass index OR BMI OR skin folds OR skin-folds OR skin-fold OR skin-folds)</td>
<td>22758</td>
</tr>
<tr>
<td>#8</td>
<td>((cardiovascular disease* OR heart disease* OR vascular disease*) ADJ risk*)</td>
<td>521</td>
</tr>
<tr>
<td>#9</td>
<td>(self-esteem OR self concept OR motor development OR child development)</td>
<td>12080</td>
</tr>
<tr>
<td>#10</td>
<td>(cognition development OR behavioural conduct OR behavioral conduct OR pro-social behaviour OR prosocial behaviour OR prosocial behavior)</td>
<td>4263</td>
</tr>
<tr>
<td>#11</td>
<td>(#7 OR #8 OR #9 OR #10)</td>
<td>36724</td>
</tr>
<tr>
<td>#12</td>
<td>(#6 AND #11)</td>
<td>2220</td>
</tr>
<tr>
<td>#13</td>
<td>(child* OR infant* OR preschool* OR pediatric OR paediatric)</td>
<td>86544</td>
</tr>
<tr>
<td>#14</td>
<td>(#12 AND #13)</td>
<td>873</td>
</tr>
<tr>
<td>#15</td>
<td>(#14)</td>
<td>547</td>
</tr>
</tbody>
</table>
APPENDIX D: Search Strategy for risk of harms associated with decreased sedentary behaviour

Database(s): Ovid MEDLINE(R) 1948 to November Week 3 2011

Search Strategy:

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>sedentar*.tw.</td>
<td>13369</td>
</tr>
<tr>
<td>2</td>
<td>sedentary lifestyle/</td>
<td>908</td>
</tr>
<tr>
<td>3</td>
<td>((chair or sitting or car or automobile or bus or indoor or in-door or screen or computer) adj time).tw.</td>
<td>627</td>
</tr>
<tr>
<td>4</td>
<td>low energy expenditure.tw.</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>(computer* or video game* or ((television adj watch*) or tv watch)).tw.</td>
<td>193762</td>
</tr>
<tr>
<td>6</td>
<td>television/</td>
<td>10730</td>
</tr>
<tr>
<td>7</td>
<td>computer/</td>
<td>48010</td>
</tr>
<tr>
<td>8</td>
<td>&quot;video games&quot;/</td>
<td>1347</td>
</tr>
<tr>
<td>9</td>
<td>(screen based entertainment or screen-based entertainment or screen time).tw.</td>
<td>189</td>
</tr>
<tr>
<td>10</td>
<td>physical inactivit*.tw.</td>
<td>2793</td>
</tr>
<tr>
<td>11</td>
<td>sitting.tw.</td>
<td>12105</td>
</tr>
<tr>
<td>12</td>
<td>1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11</td>
<td>257143</td>
</tr>
<tr>
<td>13</td>
<td>Musculoskeletal Physiological Processes/</td>
<td>34</td>
</tr>
<tr>
<td>14</td>
<td>&quot;Wounds and Injuries&quot;/ep, pc [Epidemiology, Prevention &amp; Control]</td>
<td>12728</td>
</tr>
<tr>
<td>15</td>
<td>12 and 14</td>
<td>248</td>
</tr>
<tr>
<td>16</td>
<td>limit 15 to (&quot;infant (1 to 23 months)&quot; or &quot;preschool child (2 to 5 years)&quot;)</td>
<td>57</td>
</tr>
</tbody>
</table>
## APPENDIX E: AGREE II assessment

### AGREE II Reporting Grid – 2012 Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0 - 4 years)

<table>
<thead>
<tr>
<th>AGREE II Item</th>
<th>Reporting Location for Sedentary Behaviour Guidelines</th>
<th>Internal AGREE II Score</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 1. Scope and Purpose</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The overall objective(s) of the guideline is (are) specifically described.</td>
<td></td>
<td>7</td>
<td>Describes health intent, expected outcomes, and guideline targets.</td>
</tr>
<tr>
<td>2. The health question(s) covered by the guideline is (are) specifically described.</td>
<td></td>
<td>7</td>
<td>Describes target population, intervention, outcomes, and health care setting.</td>
</tr>
<tr>
<td>3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.</td>
<td></td>
<td>7</td>
<td>Describes target population, gender, ages, clinical conditions</td>
</tr>
<tr>
<td><strong>Domain 2. Stakeholder Involvement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The guideline development group includes individuals from all the relevant professional groups.</td>
<td></td>
<td>7</td>
<td>International multidisciplinary group, including scientists, guideline developers, government, and methodologists; describes each person’s name, expertise, affiliation, location, and role</td>
</tr>
<tr>
<td>5. The views and preferences of the target population (patients, public, etc.) have been sought.</td>
<td></td>
<td>7</td>
<td>Description of stakeholder consultation process (on-line surveys), information gathered, and how feedback informed final guideline recommendations</td>
</tr>
<tr>
<td>6. The target users of the guideline are clearly defined.</td>
<td></td>
<td>7</td>
<td>Describes the intended guideline audience, and describes how the guideline may be used by the target audience.</td>
</tr>
<tr>
<td><strong>Domain 3. Rigour of Development</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Systematic methods were used to search for evidence.</td>
<td></td>
<td>7</td>
<td>Systematic review reports evidence sources, time periods, search terms, and search strategies.</td>
</tr>
<tr>
<td>8. The criteria for selecting the evidence are clearly described.</td>
<td></td>
<td>7</td>
<td>Systematic review reports inclusion (population, study design, comparisons, language, and context) and exclusion criteria.</td>
</tr>
<tr>
<td>9. The strengths and limitations of the body of evidence are clearly</td>
<td></td>
<td>7</td>
<td>Systematic review reports study design, methodology limitations, relevance of outcomes, consistency</td>
</tr>
<tr>
<td>AGREE II Item</td>
<td>Reporting Location for Sedentary Behaviour Guidelines</td>
<td>Internal AGREE II Score</td>
<td>Rationale</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------</td>
<td>-------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>described.</td>
<td>Clinical practice guideline paper – Discussion, Future research, Systematic review</td>
<td>N/A</td>
<td>and direction of results across studies, magnitude of benefit vs. harm (pending available data), and applicability</td>
</tr>
<tr>
<td>10. The methods for formulating the recommendations are clearly described.</td>
<td>Clinical practice guideline development report – Summary, Development of Guideline Recommendations; Stakeholder process</td>
<td>7</td>
<td>Described development of guideline consensus recommendation process, results from stakeholder feedback, and final development of recommendations</td>
</tr>
<tr>
<td>11. The health benefits, side effects and risks have been considered in formulating the recommendations.</td>
<td>Clinical practice guideline paper – Methods</td>
<td>7</td>
<td>Reported supporting data and report of benefits. Attempted to identify studies of harms/ side effects.</td>
</tr>
<tr>
<td>12. There is an explicit link between the recommendations and the supporting evidence.</td>
<td>Clinical practice guideline development report – Methods – summary of evidence</td>
<td>7</td>
<td>Specific citations to systematic reviews and summary tables of evidence</td>
</tr>
<tr>
<td>13. The guideline has been externally reviewed by experts prior to its publication.</td>
<td>Clinical practice guideline development report –Development of Guideline Recommendations, Stakeholder feedback</td>
<td>7</td>
<td>Description of external review purpose (feedback on draft recommendations), methods, invitees, information gathered, and how the information informed the guidelines.</td>
</tr>
<tr>
<td>14. A procedure for updating the guideline is provided.</td>
<td>Clinical practice guideline development report – Summary, Development of Guideline Recommendations</td>
<td>7</td>
<td>Described the guideline date, an explicit timeline for guideline updates, and mechanism for updates</td>
</tr>
<tr>
<td>Domain 4. Clarity of Presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. The recommendations are specific and unambiguous.</td>
<td>Clinical practice guideline development report – Summary, Table 4</td>
<td>7</td>
<td>Explicitly states the recommended action, purpose of the recommended action, recommended population, and qualifying statements</td>
</tr>
<tr>
<td>16. The different options for management of the condition or health issue are clearly presented.</td>
<td>Clinical practice guideline development report – Dissemination and implementation</td>
<td>N/A</td>
<td>The guidelines focus on sedentary behaviour for health outcomes.</td>
</tr>
<tr>
<td>17. Key recommendations are easily identifiable.</td>
<td>Clinical practice guideline development report – Summary, Final Guidelines</td>
<td>7</td>
<td>Specific recommendations are grouped together in the Summary, Final Guidelines, and Results sections.</td>
</tr>
<tr>
<td>Domain 5. Applicability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. The guideline describes facilitators and barriers to its application.</td>
<td>Clinical practice guideline development report – Dissemination and Implementation</td>
<td>2 (interim score)</td>
<td>Description of potential barriers and facilitators to framing guideline recommendations, and messaging to improve guideline adherence in progress. No explicit description about how information regarding barriers and facilitator to implementing the recommendations</td>
</tr>
<tr>
<td>AGREE II Item</td>
<td>Reporting Location for Sedentary Behaviour Guidelines</td>
<td>Internal AGREE II Score</td>
<td>Rationale</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------</td>
<td>-------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>19. The guideline provides advice and/or tools on how the recommendations can be put into practice.</td>
<td>• Clinical practice guideline development report – Summary; Dissemination and Implementation • Clinical practice guideline paper – Dissemination and Implementation</td>
<td>6</td>
<td>reported.</td>
</tr>
<tr>
<td>20. The potential resource implications of applying the recommendations have been considered.</td>
<td>• Clinical practice guideline development report – Surveillance</td>
<td>3</td>
<td>We do not discuss the potential resource implications of applying the recommendations.</td>
</tr>
<tr>
<td>21. The guideline presents monitoring and/or auditing criteria.</td>
<td>• Clinical practice guideline development report – Surveillance • Clinical practice guideline paper - Surveillance</td>
<td>6</td>
<td>Identifies data sources and links that monitor guideline concordance. Provides an example of how one of the data sources will monitor guideline concordance.</td>
</tr>
</tbody>
</table>

**Domain 6. Editorial Independence**

| 22. The views of the funding body have not influenced the content of the guideline. | • Clinical practice guideline development report – Summary, Disclaimer • Clinical practice guideline paper - Acknowledgements | 7 | Funding sources identified, and statement that the funding sources did not influence guideline content. |

| 23. Competing interests of guideline development group members have been recorded and addressed. | • Clinical practice guideline development report – Appendix A • Systematic review | 7 | Description of types and methods of data collection for competing interests. |

**Legend:**

**Clinical practice guideline development report:** Canadian Sedentary Behaviour Guidelines Clinical Practice Guideline Development Report, *Canadian Society for Exercise Physiology*


Page 49 of 49