University of BRISTOL

UK physical activity guidelines: Draft review and recommendations for the Under 5s

Professor John J Reilly (WG chair)

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THEN: UK Early Years Guidelines, 2011

1. **Physical activity should be encouraged from birth**, particularly through floor-based play and water-based activities in safe environments.

2. Children of **pre-school** age who are **capable of walking unaided** should be physically active daily for at least **180 minutes** (3 hours), spread throughout the day.

3. All under 5s should **minimise the amount of time spent being sedentary** (being restrained or sitting) for extended periods.

NOW: PHYSICAL ACTIVITY NOT SEEN IN ISOLATION

'INTEGRATED' 24 HOUR MOVEMENT PARADIGM AND GUIDELINES

The whole day matters

Movement Continuum

Sleep

Sedentary Behaviours

Light PA

Moderate PA

Vigorous PA

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RESEARCH Open Access

Systematic review of the relationships between combinations of movement behaviours and health indicators in the early years (0-4 years)

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UNIVERSITY OF ALBERTA

New evidence: partial support for UK 2011 guideline

UK 2018 EWG work based on GRADE 'Adolopment'

Plus: Literature search updated and extended to Feb 2018 courtesy of WHO
Additional rapid systematic reviews assessing PA/ Screen → Sleep

ELSEVIER

Journal of Clinical Epidemiology

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GRADE Evidence to Decision (EtD) frameworks for adoption, adaptation, and de novo development of trustworthy recommendations: GRADE-ADOLOPMENT

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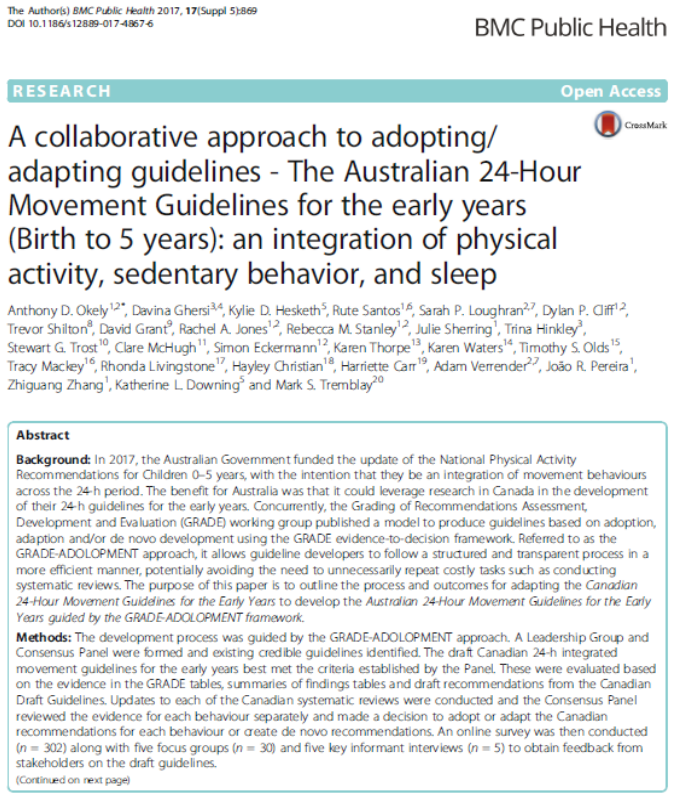
Abstract

Background: Guideline developers can: (1) adopt existing recommendations from others; (2) adapt existing recommendations to their own context; or (3) create recommendations de novo. Monetary and nonmonetary resources, credibility, maximization of uptake, as well as logical arguments should guide the choice of the approach and processes.



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A collaborative approach to adopting/ adapting guidelines - The Australian 24-Hour Movement Guidelines for the early years (Birth to 5 years): an integration of physical activity, sedentary behavior, and sleep

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Abstract

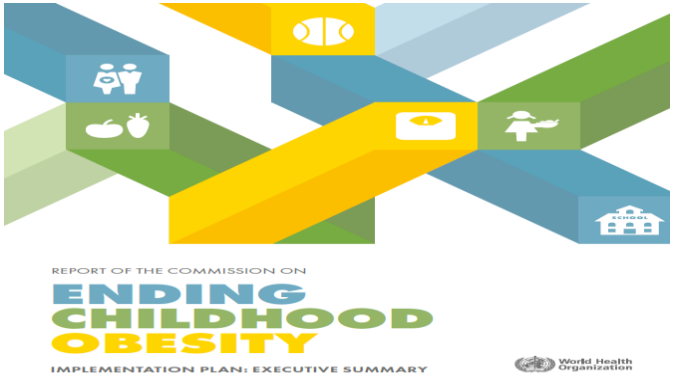
Background: In 2017, the Australian Government funded the update of the National Physical Activity Recommendations for Children 0–5 years, with the intention that they be an integration of movement behaviours across the 24-h period. The benefit for Australia was that it could leverage research in Canada in the development of their 24-h guidelines for the early years. Concurrently, the Grading of Recommendations Assessment, Development and Evaluation (GRADE) working group published a model to produce guidelines based on adoption, adaption and/or de novo development using the GRADE evidence-to-decision framework. Referred to as the GRADE-ADOLOPMENT approach, it allows guideline developers to follow a structured and transparent process in a more efficient manner, potentially avoiding the need to unnecessarily repeat costly tasks such as conducting systematic reviews. The purpose of this paper is to outline the process and outcomes for adapting the *Canadian 24-Hour Movement Guidelines for the Early Years* to develop the *Australian 24-Hour Movement Guidelines for the Early Years guided by the GRADE-ADOLOPMENT framework.*

Methods: The development process was guided by the GRADE-ADOLOPMENT approach. A Leadership Group and Consensus Panel were formed and existing credible guidelines identified. The draft Canadian 24-h integrated movement guidelines for the early years best met the criteria established by the Panel. These were evaluated based on the evidence in the GRADE tables, summaries of findings tables and draft recommendations from the Canadian Draft Guidelines. Updates to each of the Canadian systematic reviews were conducted and the Consensus Panel reviewed the evidence for each behaviour separately and made a decision to adopt or adapt the Canadian recommendations for each behaviour or create de novo recommendations. An online survey was then conducted ($n = 302$) along with five focus groups ($n = 30$) and five key informant interviews ($n = 5$) to obtain feedback from stakeholders on the draft guidelines.

(Continued on next page)

Other Key Issues in Guideline Development Considered by EWG

- **Defaults & International Harmonisation**
  - UK 2011 guideline;
  - Canadian & Australian Guidelines 2017
  - S. African & WHO Guidelines 2018
  - WHO ECHO Reports 2016 & 2017



- **Consultations – e.g. see Technical Report**

- **The Context**

- Movement behaviours related to later years when well-established links with health & other outcomes
  - e.g. Carson et al 2016
  - Poitras et al 2016

- Physical activity declines & sedentary behaviour increases from school-entry
  - e.g. Cooper et al 2015; Janssen et al 2016; Farooq et al 2018

- Concerns - high/increasing prevalence of over-fatness, low cardio-respiratory fitness, poor motor skills
- Demand & need for guidance

Evidence Base

Literature search updated and extended to Feb 2018 courtesy of WHO

- **Populations**
  - Infants (<1 year); Toddlers (1.0-2.9 years); Pre-schoolers (3.0-4.9 years)
- **Exposures**
  - Physical activity (multiple); Sedentary Behaviour (multiple); Sleep Duration
- **Outcomes**
  - adiposity,
  - motor development,
  - emotional-behavioural regulation;
  - psychosocial health (e.g. quality of life) ,
  - cognitive development,
  - cardiovascular and musculoskeletal fitness,
  - harms (i.e. injuries),
  - skeletal health,
  - cardiometabolic health,
  - growth,
  - physical activity/TV viewing (outcomes with sleep as the exposure variable)

Key Issue: Beyond Sleep Duration
New Rapid Reviews with Sleep Outcomes

Literature search - conducted April 2018

- Screen time: n=25 papers; Physical Activity: n= 8 papers ; 29/30 observational studies; one RCT (moderate quality)
- High generalisability to UK: evidence largely from high income western countries.

Populations Infants ; Toddlers; Pre-schoolers

Exposures

- Physical activity

  Outdoor play time; Total PA; Moderate-vigorous PA; Vigorous PA

- Screen time

  Screen time (TV, tablet, phone, playing computer games, using the internet); Evening screen time; Objectively measured sedentary behaviour

Outcomes

Sleep duration; Night wakening; Sleep onset latency; Bedtime; Sleep problems/ quality; Sleep habits; Daytime napping

Headline Findings

- Physical activity

  More outdoor play time (and MVPA) associated with better sleep outcomes (in pre-schoolers)

- Screen time

  More (TV) screen time associated with worse sleep outcomes (in pre-schoolers)

Draft Recommendations, Infants (less than 1 year)

For infants, a healthy 24 hours includes:

- **PHYSICAL ACTIVITY**. Being physically active several times in a variety of ways, including interactive floor-based activity; more is better. For those not yet mobile, this includes *at least 30 minutes of tummy time*[Footnote1] *while awake* spread throughout the day.
- **SEDENTARY BEHAVIOUR.** Minimising the amount of time restrained (e.g., in a stroller or high chair). Screen-time is not recommended[Footnote2]. When sedentary, engaging in pursuits such as reading and storytelling with a caregiver is encouraged.
- **SLEEP.** 14 to 17 hours (for those aged 0-3 months) or 12 to 15 hours (for those aged 4-11 months) of sleep, including naps.

Footnote 1. Tummy time may be unfamiliar to babies at first, but can be increased gradually as the baby becomes used to it. **Footnote 2**. There was a lack of evidence on the health and developmental impact of more recent screen-based technology-which often involves or requires interaction with other individuals (e.g. family members). The Expert Working Group felt that this accompanied/more interactive screen-time had less potential for harm and greater potential for benefits than more passive screen-time.

Draft Recommendations, Toddlers (1-2 years)

For toddlers, a healthy 24 hours includes:

- **PHYSICAL ACTIVITY**. At least 180 minutes spent in a variety of physical activities at any intensity, including active and outdoor play, spread throughout the day—more is better.
- **SEDENTARY BEHAVIOUR**. Not being restrained (e.g., in a stroller or high chair) or sitting for extended periods (except when sleeping). Sedentary screen time should be no more than 1 hour; less is better[Footnote2]. When sedentary, engaging in pursuits such as reading and storytelling with a caregiver is encouraged.
- **SLEEP**. 11 to 14 hours of good-quality sleep[Footnote3] , including naps, with consistent bedtimes and wake-up times, *and avoiding use of screens before bed-time.*

Footnote 2. The evidence on screen-time was largely from studies of 'passive' screen-time i.e. exposure to TV and DVD screens, and on duration of exposure rather than content. There was a lack of evidence on the health and developmental impact of more recent screen-based technology-which often involves or requires interaction with other individuals (e.g. family members). The Expert Working Group felt that this accompanied/more interactive screen-time had less potential for harm and greater potential for benefits than more passive screen-time.

Footnote 3: Good quality sleep is not excessively restless or broken by long periods of wake. Note children normally have brief wakings during the night but learn to settle themselves back to sleep within a few minutes.

Draft Recommendations, Pre-schoolers (3-4 years)

For pre-schoolers, a healthy 24 hours includes:

- **PHYSICAL ACTIVITY**. At least 180 minutes spent in a variety of physical activities spread throughout the day, including active and outdoor play, more is better; the 180 minutes should include *at least 60 minutes of moderate-vigorous intensity physical activity (MVPA)*.
- **SEDENTARY BEHAVIOUR**. Not being restrained (e.g. in a buggy or car seat) or sitting for extended periods. Sedentary screen time should be no more than 1 hour; less is better[Footnote2]. When sedentary, engaging in pursuits such as reading and storytelling with a caregiver is encouraged.
- **SLEEP**. 10 to 13 hours of good-quality sleep[Footnote3], which may include a nap, with consistent bedtimes and wake-up times, *and avoiding use of screens before bed-time.*

Footnote 2. The evidence on screen-time was largely from studies of 'passive' screen-time i.e. exposure to TV and DVD screens, and on duration of exposure rather than content. There was a lack of evidence on the health and developmental impact of more recent screen-based technology-which often involves or requires interaction with other individuals (e.g. family members). The Expert Working Group felt that this accompanied/more interactive screen-time had less potential for harm and greater potential for benefits than more passive screen-time.

Footnote 3: Good quality sleep is not excessively restless or broken by long periods of wake. Note children normally have brief wakings during the night but learn to settle themselves back to sleep within a few minutes.

Main Changes Since 2011

- More evidence-based approach
- More time-specific recommendations
- Extension of guidance beyond physical activity

  to include sedentary behaviour and sleep
- More specific guidance for infants (tummy time)
- MVPA recommended for pre-schoolers
- New challenges
  - surveillance; implementation

Appendix 1. Summary of Evidence Quality, Quantity, and Generalisability: Under 5s Expert Working Group

Behaviour	Type of Evidence	Generalisability & Directions of Associations with Outcomes	Comments on Evidence
Physical Activity (PA)	**Experimental/quasi experimental studies**: 14 RCT (n 4,199) 3 cross-over trials (n 182) 11 non randomised controlled trials (n 1,654) **Observational studies**: 9 case control (n 2,404) 16 longitudinal (n 18,354) 63 cross-sectional (n 77,452)	High generalisability to UK-evidence largely from high-income western countries **More PA is associated with improved**: **adiposity** (infants); **motor development** (infants, toddlers, pre-schoolers); **cognitive development** (infants, pre-schoolers); **fitness** (pre- schoolers); **bone/skeletal health** (pre-schoolers); **cardiometabolic health** (pre-schoolers).	Evidence for specific amounts/types of PA not clear /conclusive for all populations, but clear that 'more is better'. New evidence for benefits of higher intensity (MVPA) in pre-schoolers, and 'dose' of tummy-time in infants, and active/outdoor play.
Sedentary Behaviour (SB)	**Experimental/quasi experimental studies**: 2 RCT (n 482) **Observational studies:** 7 case-control (n 2,374) 34 longitudinal (n 78,100) 79 cross-sectional (n 167,946)	High generalisability to UK-as noted above for PA. **More SB is associated with: higher adiposity** (infants, toddlers, pre-schoolers); poorer **motor development** (toddlers), poorer **cognitive development** (infants, toddlers, pre-schoolers); poorer **psychosocial health** (pre-schoolers).	Most of the evidence is on screen time (duration), mainly TV/DVD viewing. Evidence for specific amounts inconclusive, but clear that 'less is better'.
Sleep	**Experimental/quasi-experimental studies**: 2 RCT/controlled trials (n 67) 3 cross-over trials (n 45) **Observational studies** 3 case-control (n 810); 27 longitudinal (n 98,340); 48 cross-sectional (n 90,834)	High generalisability to UK-as noted above for PA. **Shorter sleep duration is associated with: higher adiposity** (pre-schoolers); **poorer emotional regulation** (infants, toddlers, pre-schoolers); **poorer cognitive development** (pre-schoolers).	Increased sleep duration within a currently recommended range seems to have little evidence of harm. Evidence largely on duration of sleep rather than related behaviours (e.g. sleep environment and routine). Evidence for specific amounts inconclusive

Appendix 2. Summary of Evidence – Sleep Rapid Reviews Under 5s Expert Working Group

Exposure	Type of Evidence	Associations with Sleep Outcomes	Comments
Outdoor play time	**Observational studies** 1 longitudinal (n 369) 1 cross-sectional (n 497)	**More play associated with longer sleep duration** (pre-schoolers), **earlier bedtime** (pre-schoolers), **less night wakening** (toddlers). No association with sleep latency (toddlers, pre-schoolers)	No evidence available for infants. Included studies assess both toddlers and pre-schoolers
Total PA	**Observational studies** 1 cross-sectional (n 216)	**More TPA associated with shorter sleep duration and more time awake at night** (pre-schoolers)	No evidence available for infants and toddlers Scarce evidence assesses associations in pre-schoolers only. A range of sleep outcomes assessed
MVPA	**Experimental** 1 RCT (n 826) **Observational studies** 1 longitudinal (n 183) 2 cross-sectional (n 243)	**More MVPA associated with better sleep stability**; no association with sleep quality or sleep duration at night (preschoolers)	
VPA	**Observational studies** 1 cross-sectional (n 131)	No association with sufficient sleep (pre-schoolers)	
Screen time	**Observational studies** 6 longitudinal studies (n 6648) 18 cross-sectional studies (n 51 697)	No association between screen time and sleep outcomes for infants. **More TV time associated with shorter sleep duration; more screen time associated with night wakening; longer sleep onset latency** (toddlers and pre-schoolers); **later bedtime and worse sleep habits** (pre-schoolers)	No clear associations evident for other types of screen viewing (computer etc.) and sleep duration/ outcomes.
Evening Screen time	**Observational studies** 2 longitudinal (n 416) 7 cross-sectional (n 4 340)	No association between evening screen time and sleep outcomes for infants and toddlers. **More TV time associated with shorter sleep duration; more screen time associated with later bedtime and sleep problems** (pre-schoolers)	No clear associations evident for other types of screen viewing (computer etc.) and sleep duration/ outcomes.
Objective Sedentary	**Experimental studies** 1 RCT (n 826) **Observational studies** 2 cross-sectional (n 365)	No clear association between sedentary time and sleep outcomes for pre-schoolers.	No evidence for infants and toddlers Scarce evidence for objectively measured sedentary behaviour