

What are 24-hour movement guidelines? Background and rationale

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Research Laboratory



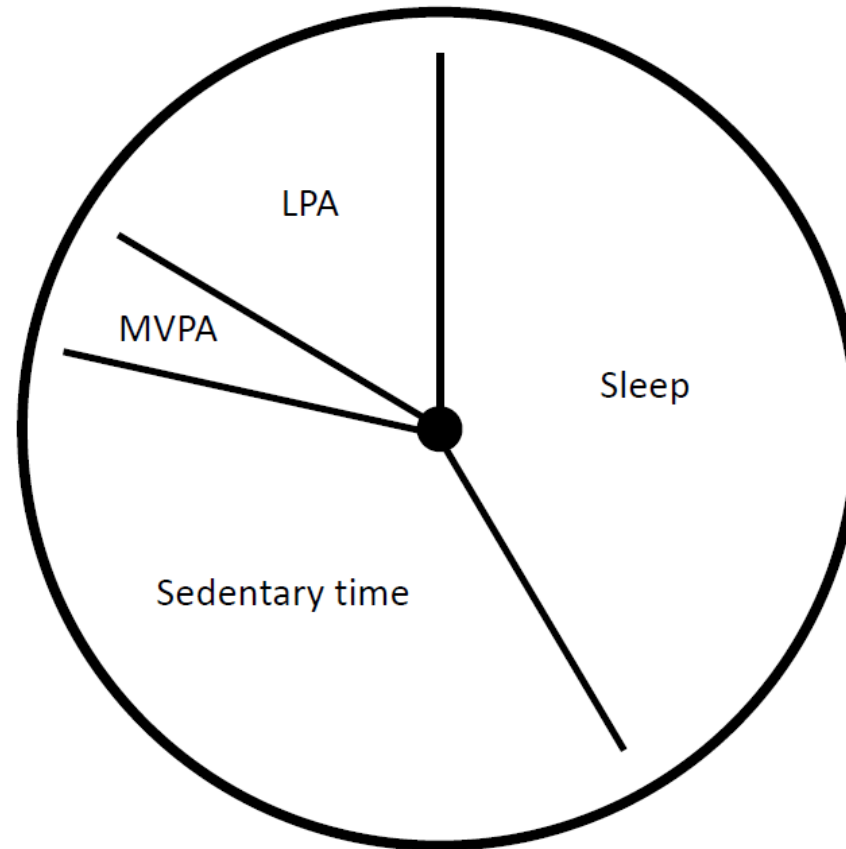
aurelie.baillot@uqo.ca

CONFLICT OF INTEREST DISCLOSURE

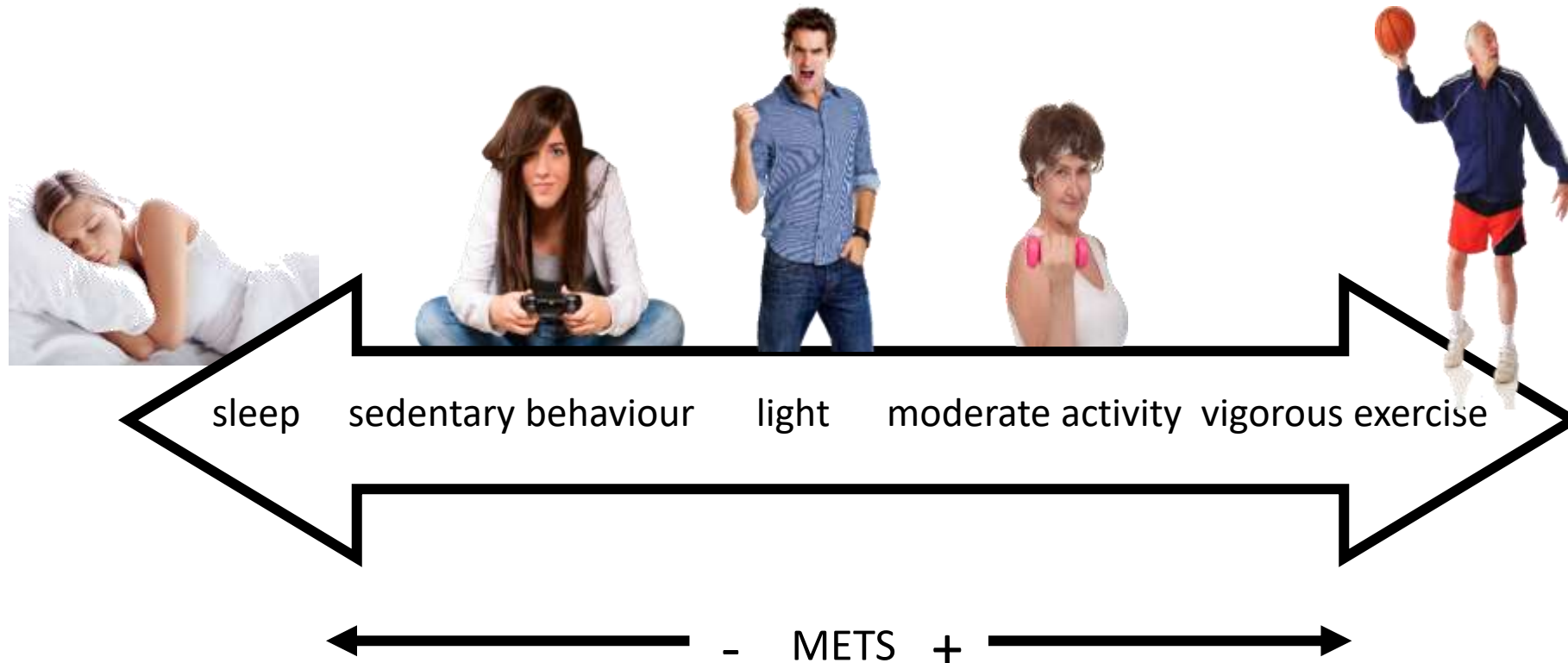
I have no potential conflict of interest to report



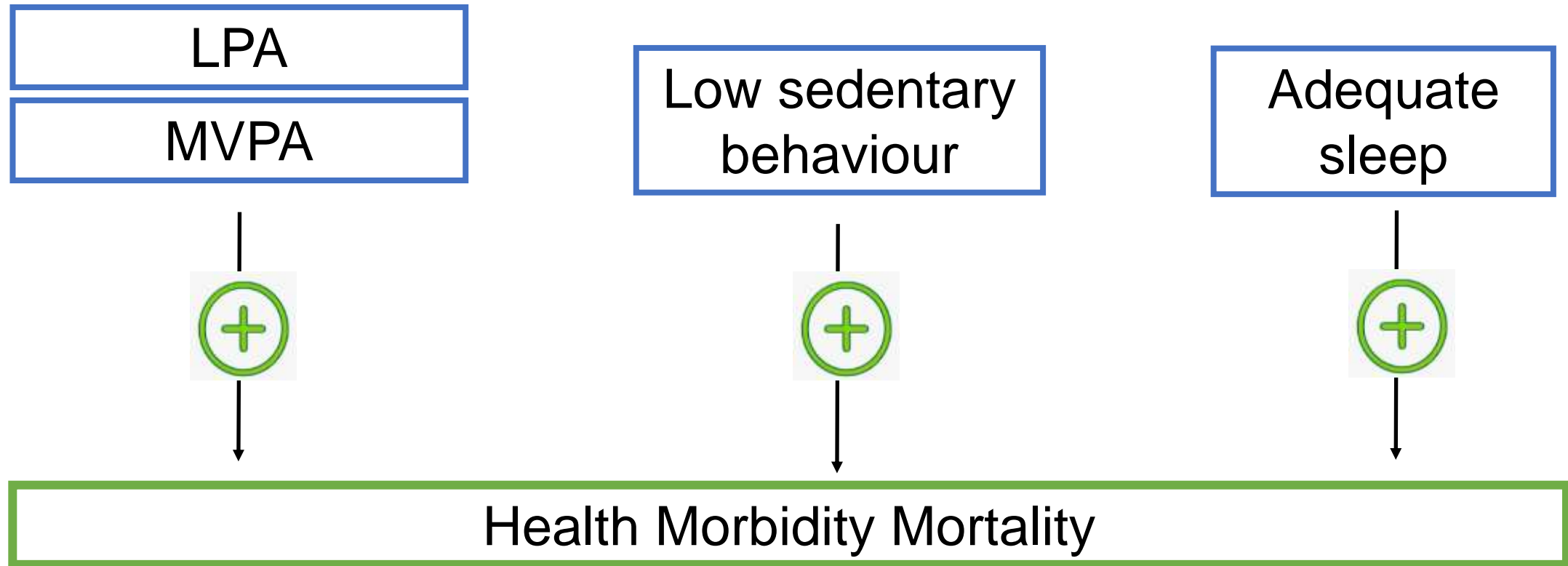
24h-period movement perspective



The movement continuum

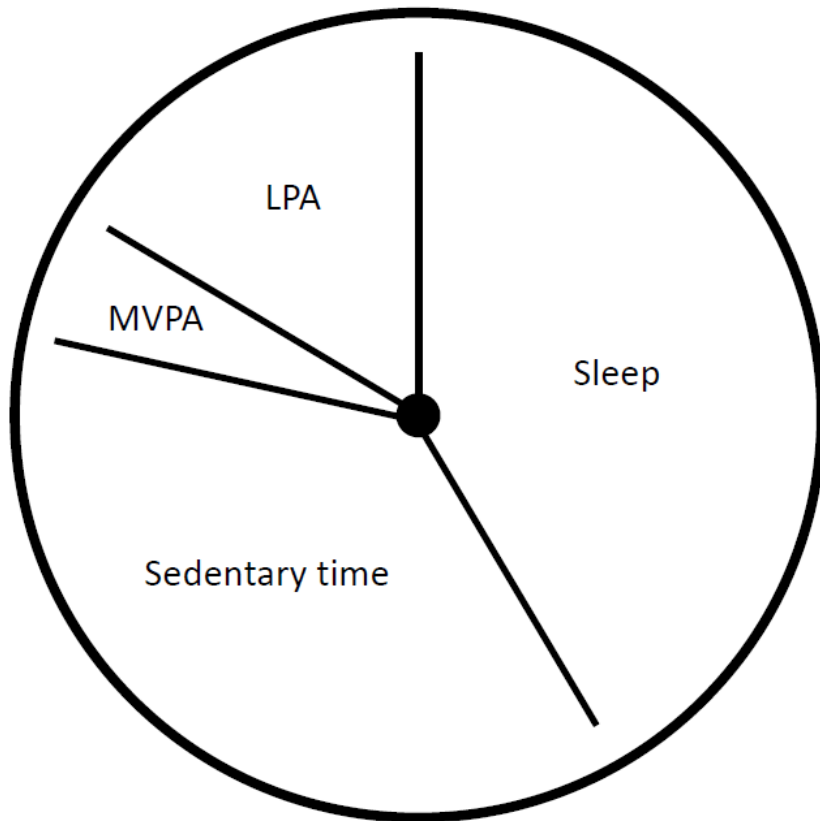


Previous research in movement behaviour



Movement behaviors have been examined in isolation with **no integrated approach**

Codependency of movements

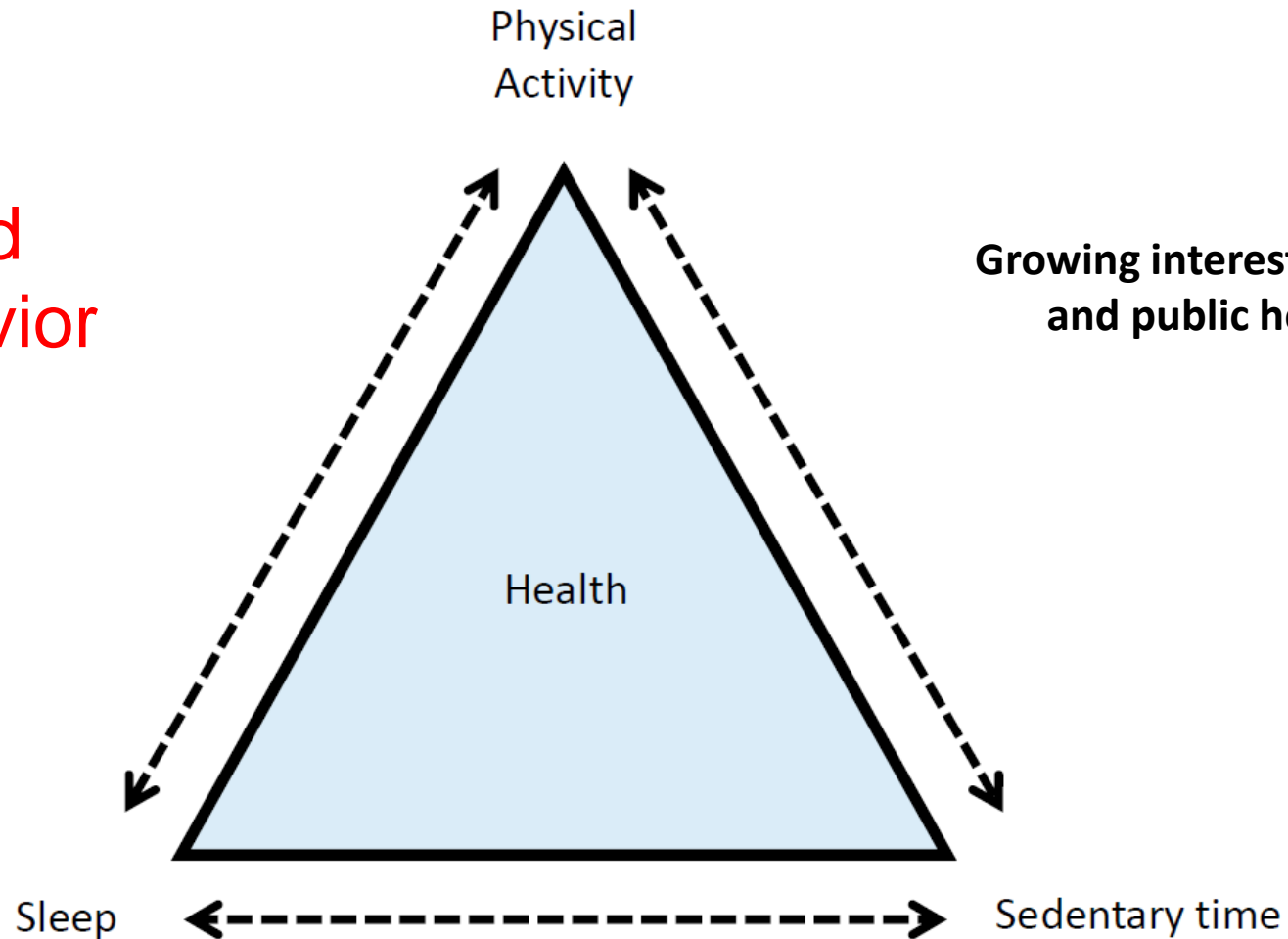


A change in the amount of time spent in any one of these behaviours will change the amount of time spent in another behaviour

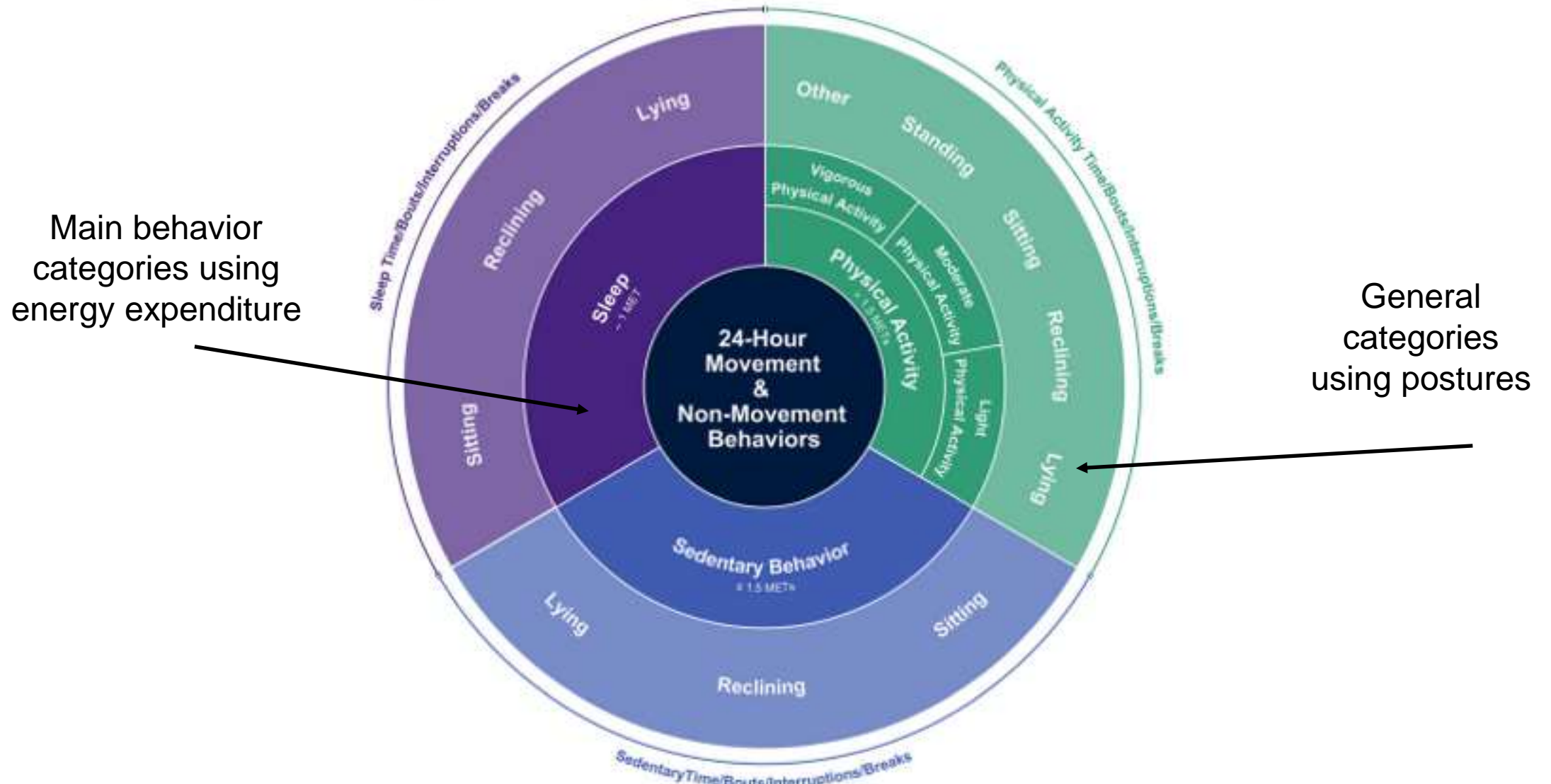
The benefits of PA are not the same if the activity is done at the expense of sleep or at the expense of sedentary behaviour

The whole day matters!

New integrated
movement behavior
paradigm



Final conceptual 24-h period model of movement



The whole 24-h time use is associated with health indicators in children and adults



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Review

The whole day matters: Understanding 24-hour movement guideline adherence and relationships with health indicators across the lifespan

Scott Rollo ^{a,b,*}, Olga Antsygina ^{a,c}, Mark S. Tremblay ^{a,b,c}

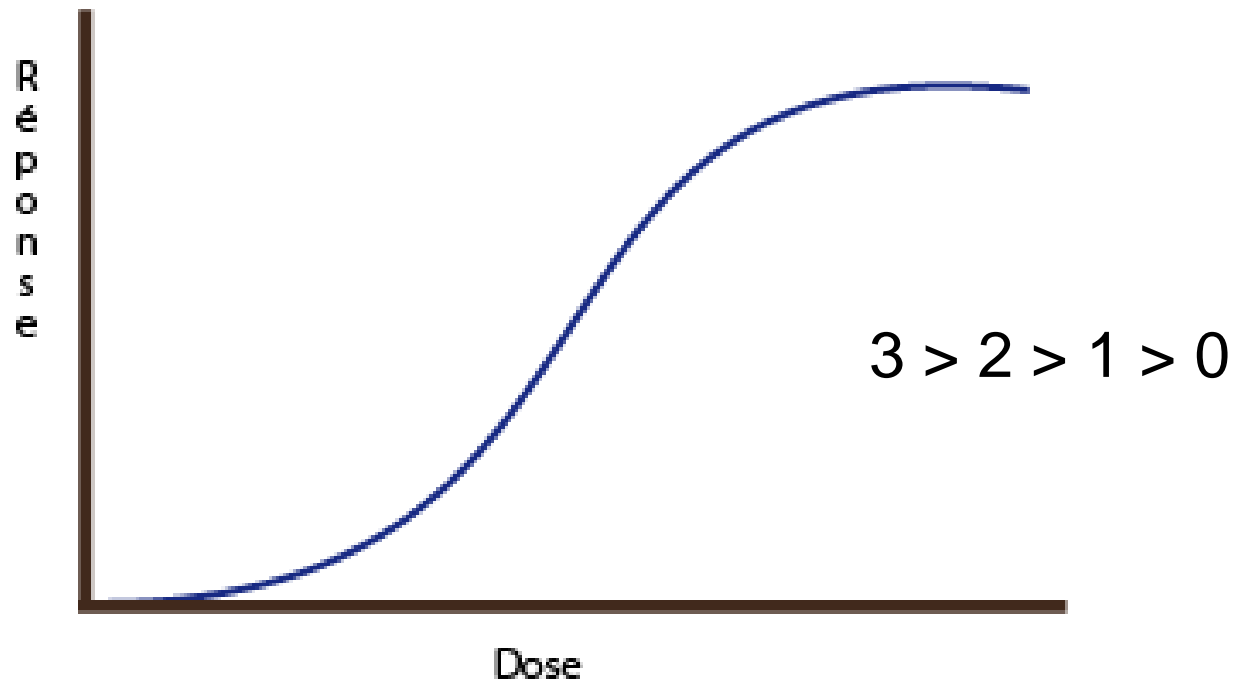
Significant associations between the composition of 24-h movement behaviours and indicators of :

- (1) *adiposity and bone and skeletal health* among preschoolers,
- (2) *quality of life* among children,
- (3) *adiposity, fitness, and cardiometabolic, social, and emotional health* among children and youth,
- (4) *cardiometabolic health* in adults,
- (5) *adiposity and fitness* among adults and older adults,
- (6) *mental health and risk of mortality* among older adults.



The whole day matters!

Courbe dose-réponse



A 24-hour movement guidelines to :

- To provide guidance to professionals, researchers, decision makers, and population.
- To establish measurable targets for surveillance allowing to :
 - compare movement behaviour practices between populations, countries...
 - inform the development of programs and policies to promote healthy movement behaviors



Development of new guidelines with the integrated approach

Canada was the first country to establish these guidelines :



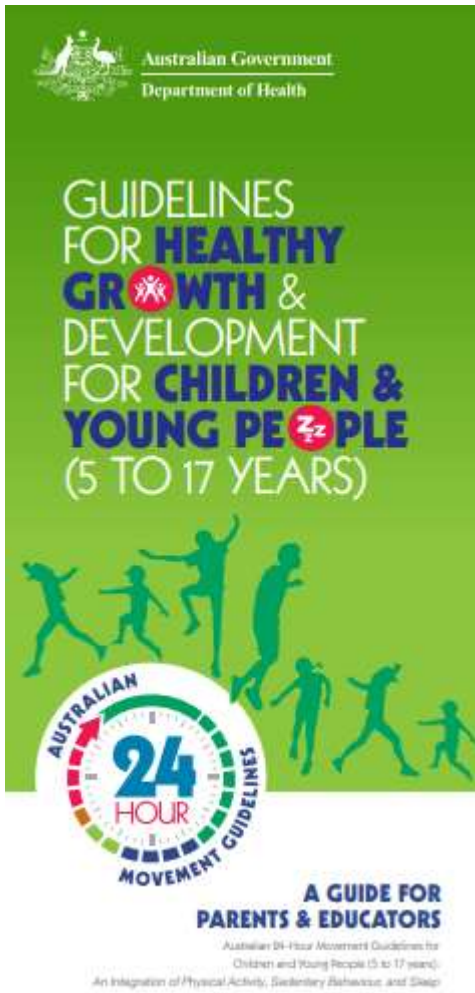
5-17 years (2016)



0-4 years (2017)



Adults (2020)



(2017)



International impact

New Zealand Government

Sit Less, Move More, Sleep Well

Physical Activity Guidelines for Children and Young People

For school-aged children and young people (aged 5 to 17 years) high levels of physical activity, low levels of sedentary behaviour and sufficient sleep each day achieves greater health benefits.

(2017)



SOUTH AFRICAN 24-HOUR MOVEMENT GUIDELINES FOR BIRTH TO FIVE YEARS



An integration of physical activity, sitting behaviour, screen time and sleep

(2020)



International impact

GUIDELINES ON
**PHYSICAL ACTIVITY,
SEDENTARY BEHAVIOUR
AND SLEEP** | **FOR CHILDREN**
UNDER 5 YEARS OF AGE



World Health
Organization

2019

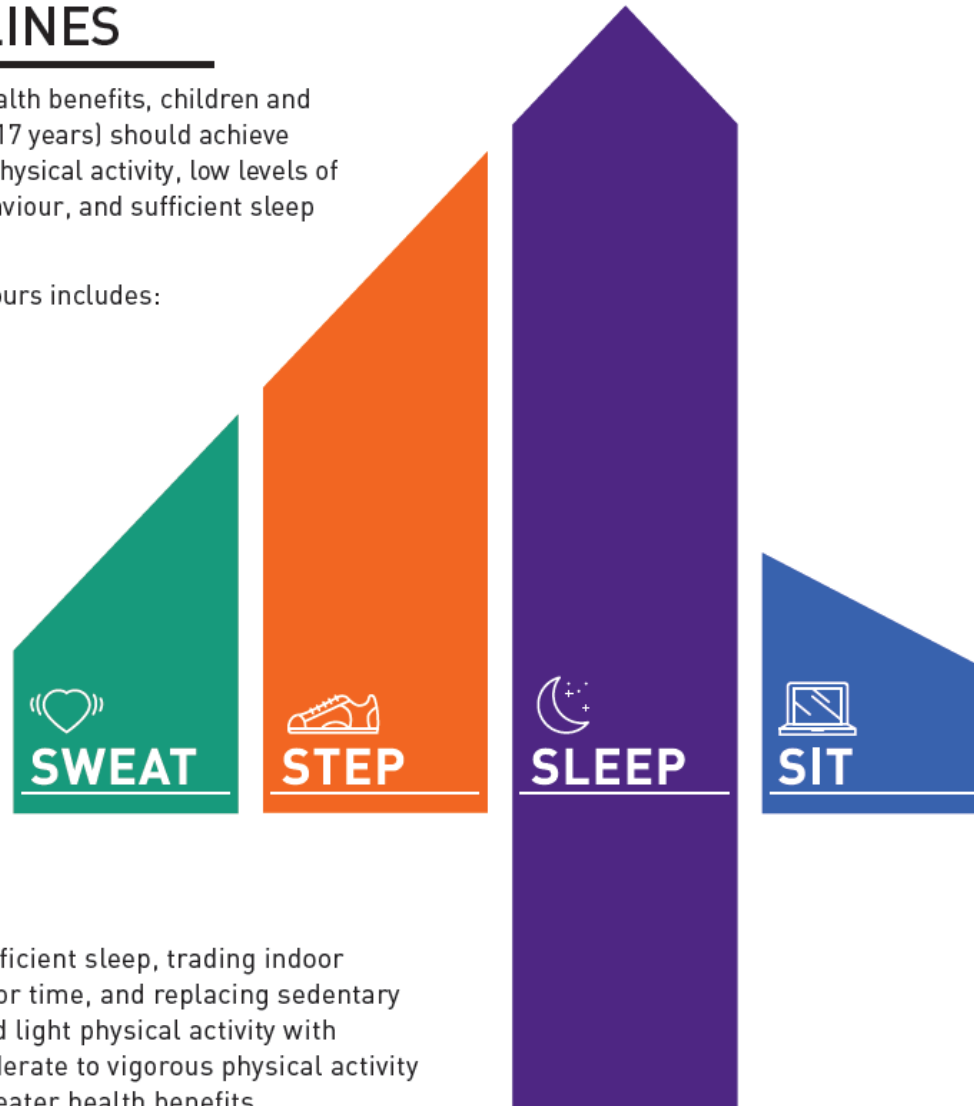


Canadian 24-Hour Movement Guidelines for Children and Youth

GUIDELINES

For optimal health benefits, children and youth (aged 5–17 years) should achieve high levels of physical activity, low levels of sedentary behaviour, and sufficient sleep each day.

A healthy 24 hours includes:



Preserving sufficient sleep, trading indoor time for outdoor time, and replacing sedentary behaviours and light physical activity with additional moderate to vigorous physical activity can provide greater health benefits.

SWEAT

MODERATE TO VIGOROUS PHYSICAL ACTIVITY

An accumulation of at least 60 minutes per day of moderate to vigorous physical activity involving a variety of aerobic activities. Vigorous physical activities, and muscle and bone strengthening activities should each be incorporated at least 3 days per week;

STEP

LIGHT PHYSICAL ACTIVITY

Several hours of a variety of structured and unstructured light physical activities;

SLEEP

SLEEP

Uninterrupted 9 to 11 hours of sleep per night for those aged 5–13 years and 8 to 10 hours per night for those aged 14–17 years, with consistent bed and wake-up times;

SIT

SEDENTARY BEHAVIOUR

No more than 2 hours per day of recreational screen time;
Limited sitting for extended periods.

18-65 y

A healthy 24 hours includes:

PHYSICAL ACTIVITY

Performing a variety of types and intensities of physical activity, which includes:



- **Moderate to vigorous aerobic physical activities** such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week



- Several hours of **light physical activities**, including standing

SLEEP



Getting 7 to 9 hours of good-quality sleep on a regular basis, with consistent bed and wake-up times

SEDENTARY BEHAVIOUR



Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time
- Breaking up long periods of sitting as often as possible



Replacing sedentary behaviour with additional physical activity and trading light physical activity for



PARTICIPACTION



QUÉBECIS

Public Health Agency of Canada
Agence de la santé publique du Canada



CSEP | SCPE



65+

A healthy 24 hours includes:

PHYSICAL ACTIVITY

Performing a variety of types and intensities of physical activity, which includes:



- **Moderate to vigorous aerobic physical activities** such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week
- Physical activities that challenge balance



- Several hours of **light physical activities**, including standing

SLEEP



Getting 7 to 8 hours of good-quality sleep on a regular basis, with consistent bed and wake-up times

SEDENTARY BEHAVIOUR



Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time
- Breaking up long periods of sitting as often as possible



Replacing sedentary behaviour with additional physical activity and trading light physical activity for more moderate to vigorous physical activity, while preserving sufficient sleep, can provide greater health benefits.



Progressing towards any of these targets will result in some health benefits.

24h movement continuum and severe obesity

Health associations with meeting the new Canadian 24-Hour Movement Guidelines recommendations according to body mass index classes in Canadian adults

by Aurélie Baillot, Jean-Philippe Chaput, Stéphanie A Prince, Ahmed Jérôme Romatin, Rachel C. Colley, and Justin J. Lang

<https://www.doi.org/10.25318/82-003-x202201100001-eng>

All adults would benefit from meeting the 24-H Guidelines, regardless of weight status

Table 2
Percentage estimates of Canadian adults meeting each recommendation or multiple recommendations within the Canadian 24-Hour Movement Guidelines for Adults and health indicators across body mass index classes

Meeting recommendation	Normal weight (n = 3,886)			Overweight (n = 3,966)			Obesity class I (n = 1,763)			Obesity classes II and III (n = 900)		
	percent	95% Confidence interval		percent	95% Confidence interval		percent	95% Confidence interval		percent	95% Confidence interval	
		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Specific guideline met												
At least MVPA	51.7	47.9	55.5	39.8	35.8	43.7	32.0	27.0	37.1	23.9	18.0	29.7
At least sedentary behaviour	19.4	17.0	21.9	18.5	15.8	21.3	16.3	12.5	20.1	11.3	7.6	15.0
At least sleep	66.9	64.3	69.5	64.3	61.4	67.1	64.4	60.5	68.4	63.8	58.4	69.2
General combinations of movement behaviours												
All three	9.5	7.5	11.4	6.1	5.1	7.1	4.3	2.8	5.8 ^E	3.9	1.8	5.9 ^E
Two out of three	34.2	30.6	37.9	29.1	26.3	31.8	26.3	21.5	31.2	19.3	13.9	24.7
One out of three	41.2	38.0	44.4	46.2	43.3	49.0	47.0	43.2	50.8	48.8	41.7	55.9
None	15.1	12.9	17.2	18.7	16.3	21.1	22.4	18.3	26.4	28.0	22.4	33.6

E use with caution

Note: MVPA == moderate-to-vigorous intensity physical activity.

Source: Canadian Health Measures Survey cycles 1 to 4.

Beneficial associations between the 24-H Guidelines recommendations and health indicators among all BMI classes

24h movement continuum and bariatric surgery

Obesity Surgery
<https://doi.org/10.1007/s11695-020-04908-3>



ORIGINAL CONTRIBUTIONS



Physical Activity, Sedentary Behavior, and Sleep Before and After Bariatric Surgery and Associations with Weight Loss Outcome

Mette S. Nielsen^{1,2} • Hagir Alsaoodi¹ • Mads F. Hjorth¹ • Anders Sjödin¹



XXVI
IFSO WORLD CONGRESS

FRIDAY, 1 SEPTEMBER

PAVILION 6
ROOM AMALFI

14.14 - 14.21	Best supportive care for patients with complex obesity	Simon Phillips	UK
14.21 - 14.28	How well do bariatric surgery patients objectively adhere to 24-hour movement guidelines preoperatively and what factors relate to better adherence?	Dale Bond	USA
14.28 - 14.35	Is HIIT more effective than MICT for body composition, functional capacity and quality of life after bariatric surgery?	Andrea Herrera Santelices	Chile
14.35 - 14.42	Changes in 24-hour movement behaviors after metabolic and bariatric surgery and their associations with weight loss: An actigraphy study	Leah Schumacher	USA

- No movement behaviors improvement after MBS
- ↗ MVPA may ↗ weight loss regardless of other movement



Futures directions

- Good-quality longitudinal and interventional studies;
- Data with valid and reliable measures;
- Data in adults, clinical and at-risk populations;
- International and cross-cultural comparisons;
- Potential moderators and mediators;
- Potential family, school, community and environment predictors of the 24-h guideline adherence



Futures directions

Consensus statement



OPEN ACCESS

GRANADA consensus on analytical approaches to assess associations with accelerometer-determined physical behaviours (physical activity, sedentary behaviour and sleep) in epidemiological studies

Jairo H Migueles ^{1,2} Eivind Aadland ³ Lars Bo Andersen ³
Jan Christian Brønd ⁴ Sebastien F Chastin ^{5,6} Bjørge H Hansen ^{7,8}
Kenn Konstabel ^{9,10,11} Olav Martin Kvalheim ¹² Duncan E McGregor ^{5,13}
Alex V Rowlands ^{14,15,16} Séverine Sabia ^{17,18} Vincent T van Hees ^{19,20}
Rosemary Walmsley ^{21,22} Francisco B Ortega ^{1,23} External review group



Box 1 Consensus points from the GRANADA report on analytical approaches to assess associations with accelerometer-determined physical behaviours (physical activity (PA), sedentary behaviour (SB) and sleep) in epidemiological studies

1. The study of the association between physical behaviours (ie, PA, SB and sleep) and health should move to a more thorough investigation of the interactions and codependencies between different behaviours (or PA intensities) and health. Several analytical approaches are provided in this consensus document, although none of them is free from limitations.
2. We recommend investigating more detailed PA intensities than the typically studied (ie, SB and moderate-to-vigorous PA). Examples include light PA of different intensities or the more fine-grained intensity bands as described in this document.
3. Public health guidelines on physical behaviours should acknowledge that behaviours are codependent and this may affect the guidelines as traditionally understood.
4. Further investigation in functional data analysis and machine learning is needed concerning the associations of physical behaviours with health.
5. There is not a gold standard able to test which analytical approach is the best for a given research question. Thus, we cannot make a strong recommendation on a single analytical approach. Instead, we provide some practical recommendations to select analytical approaches well suited for a given research question. Triangulation across findings from different analytical approaches is currently the best solution.

Conclusion

- Sleep, sedentary behaviour, and physical activity all interact together to impact health
- Adherence rates to the 24h movement guidelines are low, especially for MVPA and sedentary time
- New 24h movement guidelines around the world : implementation ?
- Additional research are required to support the 24h movement guidelines rational

THANK YOU



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