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New sedentary behaviour definitions

A terminology consensus project by the Sedentary Behaviour Research Network

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Introduction

Research studying sedentary time and sedentary behaviours has experienced substantial increases during the last 10 years. This research highlights the association between excessive sedentary behaviour and adverse health indicators or outcomes. However, as this field of research has grown, so too has confusion and inconsistency over the definition of sedentary behaviour and other related terms (e.g., screen time, sedentary behaviour patterns, bouts, breaks). In 2012, the Sedentary Behaviour Research Network (SBRN; a network connecting sedentary behaviour researchers and health professionals from around the world interested in sedentary behaviour research) published a letter proposing definitions aimed at clarifying differences between "sedentary behaviour" and "physical inactivity".¹

There remains, however, a need for further refinement and consensus on a variety of related and emergent terms (e.g., screen time, standing, sitting, reclining). Building on previous work, the SBRN orchestrated a comprehensive effort to further develop consensus definitions for terms related to sedentary behaviour research, for all age groups and for all physical abilities, through engagement of its membership.²

How did we proceed?

A series of sequential processes and various research methods were employed in an effort to derive consensus definitions for key terms in sedentary behaviour research.

1. Literature search

We reviewed the current use of the SBRN definition and potential deviations from this definition. We examined current operational definitions of sedentary behaviour and

S U M M A R Y

The *Sedentary Behaviour Research Network (SBRN) - Terminology Consensus Project Process and Outcome* was a collaborative project authored by 84 researchers from 20 countries.

The project aimed to develop consensus definitions to reduce confusion and inconsistency in the field of health research related to sedentary behaviour.

related terms (e.g., screen time, sedentary behaviour patterns, bouts, breaks) and any evidence of inconsistencies, differences, conflicts, or concerns over variations in definitions employed.

2. Establishment of a Steering Committee of SBRN members

The literature search allowed for the identification of authors of key papers who were invited to form a Steering Committee for the SBRN Terminology Consensus Project.

3. Invitation to all SBRN members to participate in the consensus project

An email was sent to the SBRN membership, consisting of researchers, scholars, practitioners, trainees, and students interested in sedentary behaviour (1,094 members worldwide in April 2016), soliciting interest in participating in the project, and asking for suggestions for key terms to be included in the survey.

4. Selecting a list of key terms

Key terms from the literature search were collated with suggested terms by the SBRN members, and the Steering Committee members were asked to add or remove key terms from the list. A final draft list of terms was agreed upon by this Committee, and it included: stationary behaviour, sedentary behaviour, standing, screen time, non-screen-based sedentary time, sitting, reclining, lying, and sedentary behaviour pattern.

5. Drafting definitions for key terms

The Steering Committee deliberated through a short survey and email communication to arrive at draft definitions for each term, important caveats for certain age and ability groups, examples to assist with interpretation and, when available, references for the proposed definition.

6. Developing a conceptual model

In parallel to this process of deliberation, a conceptual model was developed to help position the key terms in relation to one another.

7. Collecting input and feedback on the conceptual model and draft definitions from participating SBRN members

The draft definitions, caveats, examples, references, and conceptual model were included in a survey developed for distribution to participating SBRN members. The survey asked participants to assess the clarity of, and agreement with, the conceptual model and proposed definitions, while also providing an opportunity for general comments.

8. Compiling input and finalizing (reaching consensus on) the conceptual model and definitions

Input from all participants, including the Steering Committee, was consolidated and revisions to the conceptual model, definitions, caveats, examples, and references were made by the Steering Committee. The draft manuscript, including the revised conceptual model and definitions, was sent to all participants for additional review and comments.

9. Preparing the manuscript with sign-off by all participants

After additional revisions, a revised draft of the manuscript was resent to all participants for comments, group consensus, and assessment of likelihood of use. Finally, the further

Sedentary Behaviour — is any waking behaviour characterized by an energy expenditure ≤ 1.5 metabolic equivalents (METs), while in a sitting, reclining, or lying posture.*

Physical Inactivity — an insufficient physical activity level to meet present physical activity recommendations.

revised manuscript (third review) was recirculated to the project participant group for final comments and sign-off for submission.

What are the definitions?

Below are the consensus definitions. To access the caveats and specific examples of these definitions, please consult the [SBRN website](#). For more details on this project, please read the [open access full text article](#).

1. Physical Inactivity	An insufficient physical activity level to meet present physical activity recommendations.
2. Stationary Behaviour	Stationary behaviour refers to any waking behaviour done while lying, reclining, sitting, or standing, with no ambulation, irrespective of energy expenditure.
3. Sedentary Behaviour	Sedentary behaviour is any waking behaviour characterized by an energy expenditure ≤ 1.5 metabolic equivalents (METs*), while in a sitting, reclining, or lying posture.
4. Standing	A position in which one has or is maintaining an upright position while supported by one's feet.
5. Screen Time	Screen time refers to the time spent on screen-based behaviours. These behaviours can be performed while being sedentary or physically active.
6. Non-Screen-Based Sedentary Time	Non-screen-based sedentary time refers to the time spent in sedentary behaviours that do not involve the use of screens.
7. Sitting	A position in which one's weight is supported by one's buttocks rather than one's feet, and in which one's back is upright.
8. Reclining	Reclining is a body position between sitting and lying.
9. Lying	Lying refers to being in a horizontal position on a supporting surface.
10. Sedentary Behaviour Pattern	The manner in which sedentary behaviour is accumulated throughout the day or week while awake (e.g., the timing, duration, and frequency of sedentary bouts and breaks).
<p>*MET = Metabolic Equivalent. It corresponds to the resting metabolic rate of the population under study. A metabolic equivalent is deemed to be 3.5 ml O₂/kg/min in adults without mobility impairment or chronic disease. A metabolic equivalent is generally higher in children and in those with conditions that elevate muscle activity or metabolism, and it is generally lower in those with paralysis, small muscle mass, or wasting conditions. The interpretation of MET values should be made with attention to the population under study.</p>	

Sedentary Behaviour Pattern — the manner in which sedentary behaviour is accumulated throughout the day or week while awake (e.g., the timing, duration, and frequency of sedentary bouts and breaks).



The Conceptual Model of Movement-based Terminology

Illustrated below is the final conceptual model of movement-based terminology arranged around a 24-hour period. Figure 1 organizes the movements that take place throughout the day using a dual ontology. The inner ring represents the main behaviour categories using energy expenditure ontology. The outer ring provides general categories using posture ontology. Detailed definitions, caveats, and examples related to sedentary behaviours are provided in the open access full text article. The proportion of space occupied by each behaviour in Figure 1 is not prescriptive of the time that should be spent in these behaviours each day.

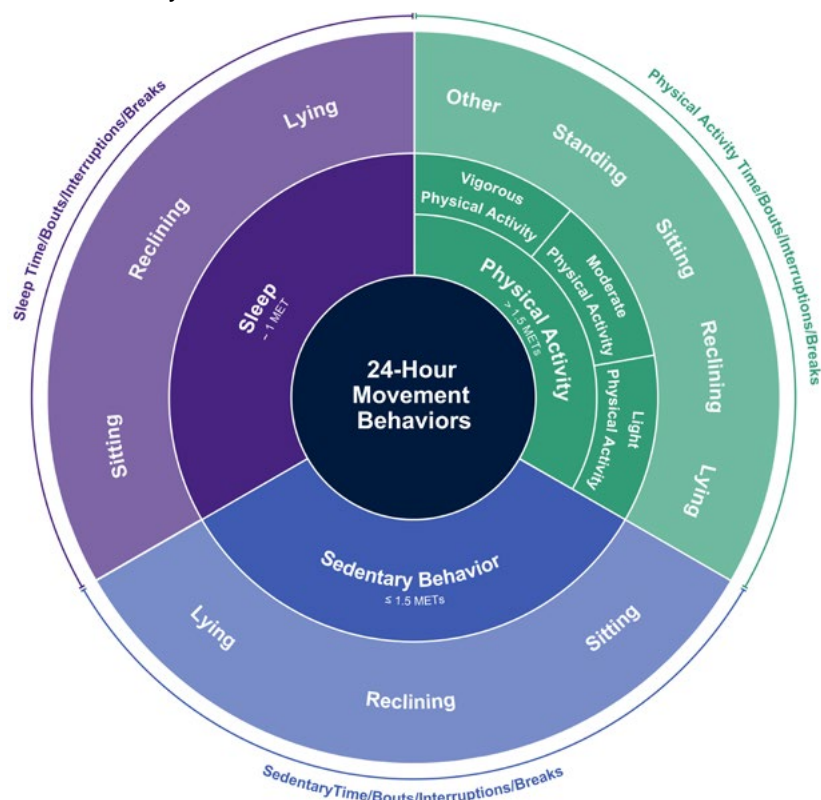


Figure 1. Conceptual model of movement-based terminology.

Who can use these definitions?

We encourage researchers, practitioners, and decision-makers to embrace, use, and promote these definitions. With the assistance of international SBRN volunteers, these definitions were translated into several other languages: Dutch, French, German, Greek, Japanese, Korean, Portuguese (from Portugal and from Brazil), Spanish, and Traditional Chinese. Copies of all language versions of the consensus definitions are available on the SBRN website. We hope that the definitions resulting from this comprehensive, transparent, and broad-based participatory process will result in widely supported and adopted standardization of terminology, and they will advance future research, interventions, policies, and practices related to sedentary behaviours.

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References

1. Sedentary Behaviour Research Network. Letter to the editor: standardized use of the terms "sedentary" and "sedentary behaviours". *Appl Physiol Nutr Metab.* 2012;37(3):540-2. doi:10.1139/h2012-024.
2. Tremblay MS, Aubert S, Barnes JD, et al. Sedentary Behaviour Research Network (SBRN) - Terminology Consensus Project process and outcome. *Int J Behav Nutr Phys Act.* 2017;14(1):75. doi:10.1186/s12966-017-0525-8.