Moderate to Vigorous Physical Activity

FACT SHEET

Moderate to Vigorous Physical Activity (MVPA) is a term found throughout the Manitoba K–12 Physical Education curriculum outcomes. The term represents an intensity level of physical activity required to meet health and fitness outcomes. Moving or exercising at an MVPA intensity level can help someone achieve significant health and fitness benefits. More specifically, moving or exercising at the moderate level contributes to greater health benefits with some fitness improvements, while moving or exercising at a vigorous level improves health components with greater improvements to physical fitness. This document, and accompanying poster with methodology sheet, will help physical education teachers and students understand MVPA, and learn simple methods to measure MVPA for the purposes of the Manitoba K–12 Physical Education/Health Education curriculum.

What Is Moderate to Vigorous Physical Activity (MVPA)?

The **Canadian 24-Hour Movement Guidelines for Children and Youth (ages 5–17)—June 2016** outlines the amount and intensity of physical activity and sleep, as well as the limits to sedentary time for children and youth aged 5 to 17 within a 24-hour period. According to these guidelines, a healthy 24-hour day should include the accumulation of at least 60 minutes of moderate physical activity (MPA) and vigorous physical activity (VPA). Vigorous physical activities and muscle and bone strengthening activities should each be incorporated at least three days per week. Several hours of a variety of structured and unstructured light physical activities should be included daily.[i]

The Importance of MVPA

Physical activity intensity corresponds to how hard a person works to complete a task and is generally separated in categories of light, moderate, and vigorous. It is individualized in that each person will respond differently to exercise depending on factors such as current fitness level, age, ability, and experience. To reach a specific intensity level, a person would have to perform the activity at an intensity level where heart rate and breathing levels increase for a minimum duration of 10 minutes allowing for a 1- to 2-minute interruption[iv].

Student benefits of MVPA include, but are not limited to, the following[v]:

- Increases physical fitness outcomes such as cardiovascular fitness, muscular development, and obesity prevention
- Improves health with lower risk of chronic cardiovascular, pulmonary, and musculoskeletal diseases; cancers; and diabetes
- Enhances mental health by reducing anxiety and stress, while improving self-esteem and mood
- Improves academic performance, cognitive function, school attendance, and positive classroom behaviour
- Provides more opportunities to meet other physical education goals such as motor development, increased fitness, skill enhancement, and positive social interactions

For more information about the importance of MVPA, please refer to the Mike Evans video titled *The Importance of Intensity in Physical Activity* (video, 4 Oct, 2016), available in English and French.

The Canadian Society of Exercise Physiologists (CSEP) defines MPA and VPA as follows:

- **Moderate Physical Activity (MPA)** is intense enough to cause breathing and heart rate to increase. During MPA a person can hear themselves breathe and talk but won't be able to sing.[ii]
- **Vigorous Physical Activity (VPA)** causes breathing and heart rate to increase to a higher level where it would be difficult to talk. During VPA a person's heart rate increases substantially and they cannot say more than a few words without pausing for a breath.[iii]

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Determining MVPA for the Purpose of the K–12 Manitoba Physical Education Curriculum

The Manitoba Physical Education and Health curriculum has identified specific learning outcomes (SLOs) where students are required to demonstrate an understanding of MVPA and calculate physical activity intensity levels.

There are several simple methods of determining exercise intensity levels. Selecting the appropriate method will depend on the age, experience, and fitness level of the individual student.

For an outline of measurements corresponding to each of these methods, refer to the *Assessing Intensity of Physical Activities* poster.

1. *Talk Test*

   This is a subjective method that uses a general understanding of a person's breathing pattern.

2. *The Borg Scale for Rating Perceived Exertion*

   There is a high correlation between perceived exertion and breathing rate. The Borg scale for rating perceived exertion (RPE) is an evidence-based tool which uses a scale (between 6 and 20) to determine a subjective rating of exertion experienced during physical activity. The scaled values of 6 and 20 are used because they represent the resting heart rate (about 60 beats per minute) and maximal heart rate (about 200 beats per minute) of a healthy young adult. The value of 6 would imply sitting at rest, while 20 would equate to the ability to perform all out maximal exercise for a few seconds.

3. *Measured Heart Rate/Percentage of Heart Rate Reserve (% of HRR or Karvonen Method)*

   Heart rate reserve is the difference between maximum heart rate and resting heart rate. The % of HRR or Karvonen Method is used to assess physical activity intensity by calculating the heart rate at a given percentage of training intensity. In other words, the Karvonen formula is used to determine an individual's target heart rate training zone.

MVPA Considerations for Teachers and Students

- It is not the type of activity that determines MVPA but how the activity is performed. Many types of physical activity can be categorized as MVPA depending on how hard an individual works, including daily chores, sports, and related activities.
- A physical activity plan should focus on activities that are enjoyable. People stay active mostly for fun and friendship.
- Intensity is the primary factor that differentiates a light, moderate, or vigorous activity level. To obtain fitness and health benefits, individuals will need to perform activities that increase heart rate and breathing for a prescribed amount of time.
- A physical activity plan should be tailored to a student's fitness level and ability. Consider selecting an assessment reporting method that fits the student's fitness level and current ability. A person with low fitness levels might see more benefit from using the talk test as opposed to measured heart rate.

Additional Resources

- Canadian Society for Exercise Physiology (CSEP). *Canadian 24-Hour Movement Guidelines: An Integration of Physical Activity, Sedentary Behaviour, and Sleep.* http://csepguidelines.ca/
- Canadian Society for Exercise Physiology (CSEP). *Canadian 24-Hour Movement Guidelines for Children and Youth (Ages 5–17 Years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep.* https://csepguidelines.ca/children-and-youth-5-17/
- Dr. Mike Evans. *Increasing Your Productivity with Exercise* (video, 4 Oct. 2016) https://www.youtube.com/watch?v=SG7n2QiaMB8 (English) https://www.youtube.com/watch?v=nJhOutMElWY (French)
- Physiotutors, *The Karvonen Formula for Target Heart Rate Calculation* (20 Dec. 2016) https://www.youtube.com/watch?v=UzRZDDMoD_M
- *Calculating Target HR Via the Karvonen Method* (23 Apr. 2017) https://www.youtube.com/watch?v=UvCoFwyWQrs

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[i] https://csepguidelines.ca/children-and-youth-5-17/

[ii] https://www.csep.ca/en/guidelines/glossary-2017

[iii] https://www.csep.ca/en/guidelines/glossary-2017

[iv] https://www.ahajournals.org/doi/pdf/10.1161/JAHA.117.007678
https://www.ncbi.nlm.nih.gov/pubmed/29567764
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4455886/

[v] https://www.csba.org/GovernanceAndPolicyResources/DistrictPolicyServices/~/media/CSBA/Files/GovernanceResources/PolicyNews_Briefs/StudentHealth/PhysEd_Actviity/2009_11_FactSheet_ModerateToVigorous.ashx