## Ontology of time spent in moderate to vigorous physical activity



CORE MEASURES of PHYSICAL ACTIVITY


Digital Measures Development

## Ontology of time spent in moderate to vigorous physical activity



## Examples

The World Health Organization and the Physical Activity Guidelines for Americans outline recommendations for number of minutes spent in MVPA in a week. The U.S. Food \& Drug Administration (FDA) endorsed time spent in MVPA as a primary endpoint measured by a wearable ( 1,2 ).

METs can be estimated with inputs such as cadence (steps/minute) (1, 2, 3, $\underline{4}, \underline{5}, \underline{6}, \underline{7}, \underline{8}$ ), actigraphy counts ( $1, \underline{2}, \underline{3}$ ), heart rate reserve (beats per minute) (1), and raw acceleration values.

HL7 Physical Activity IG and industry partners $(1,2)$ use minutes of moderate to vigorous physical activity.

## Time spent in moderate to vigorous physical activity

## Measure considerations (assumptions \& limitations):

- The metabolic equivalent of a task (MET) is a physiological measure referring to the energy expenditure required to carry out a specific activity. A single MET is the rate of energy expenditure while sitting at rest, which generally corresponds to an oxygen uptake of 3.5 milliliters per kilogram of body weight per minute. Moderate to vigorous physical activity is defined as an activity level $\geq 3$ METs and can be estimated during an exercise test on a treadmill.
- Technology developers should define criteria for labeling a data record as 'moderate' or 'vigorous' as well as 'sedentary' or per breakdown so that all data records can be classified.
- Assumes the epochs for 'moderate' and 'vigorous' are contiguous.
- Recording activity type can enable more accurate calculation.

