



Workshop 1: Can accelerometers provide all information on physical activity, postures and sleep we need?

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Why thigh-worn accelerometry?

- Health effects of physical activity not merely depend on daily METs, but also attributes like:
 - Intensity
 - Posture
 - PA type
 - Time-pattern
 - Domain

Editorial

Do all daily metabolic equivalent task units (METs) bring the same health benefits?

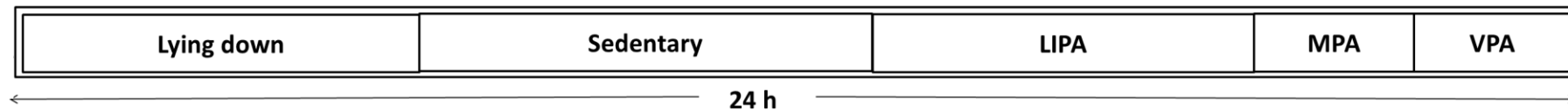
Andreas Holtermann,^{1,2} Emmanuel Stamatakis^{3,4}

Br J Sports Med 2018, 0:1-2



Which information from accelerometers do we need?

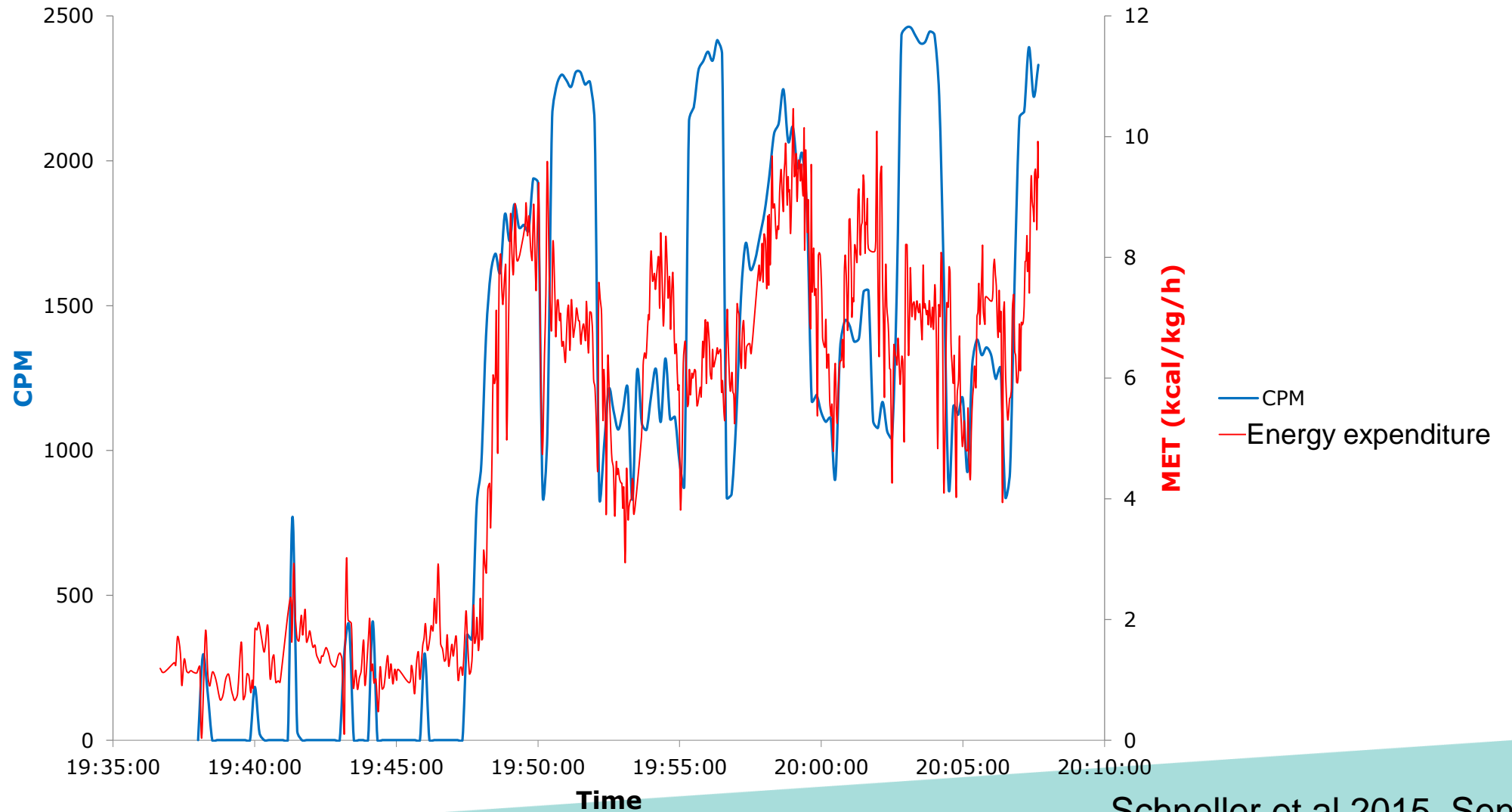
The multi-dimensional ProPASS Physical Behavior Construct

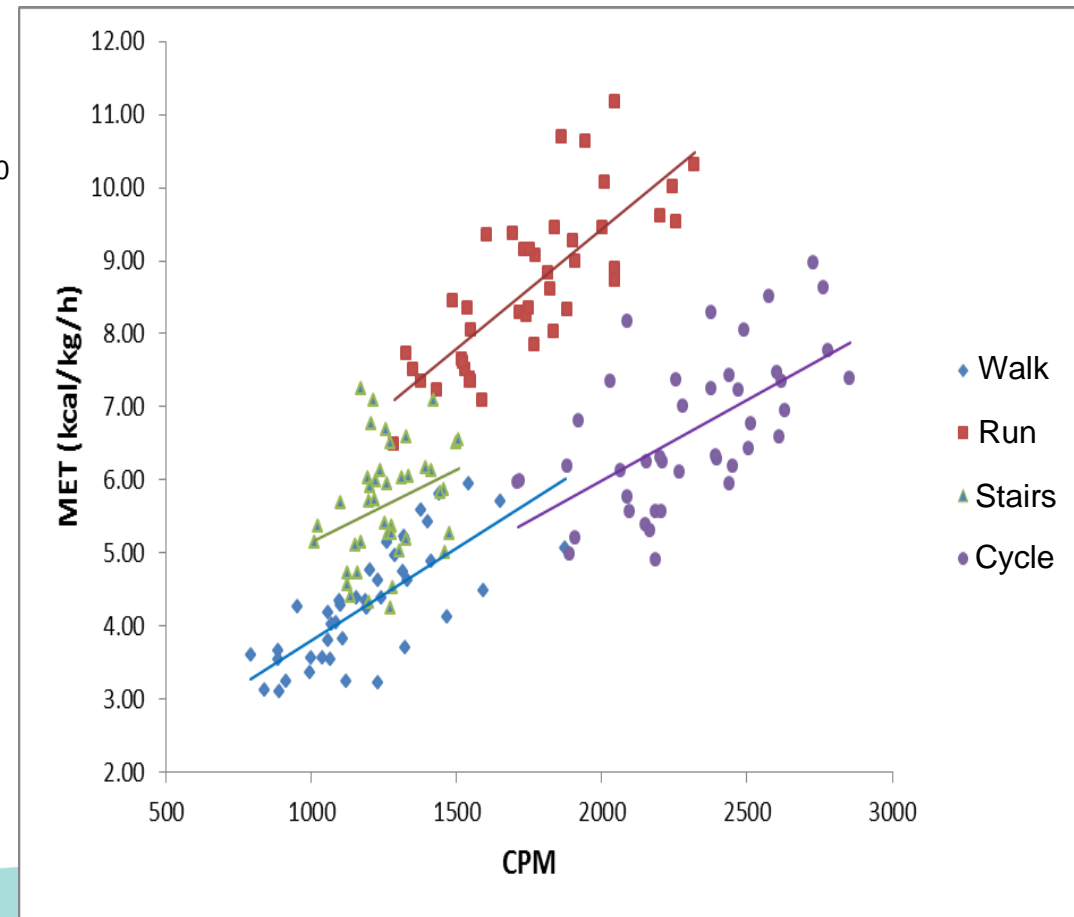
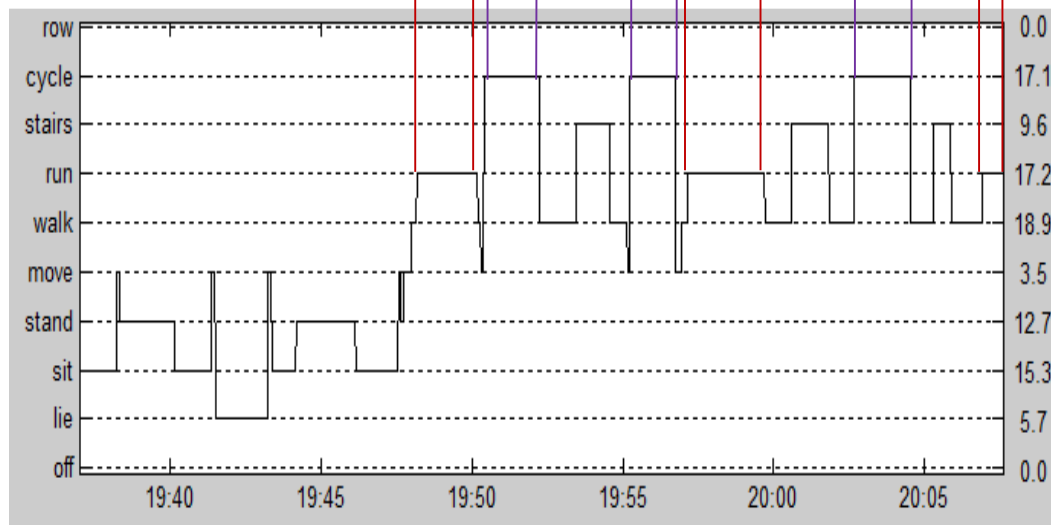
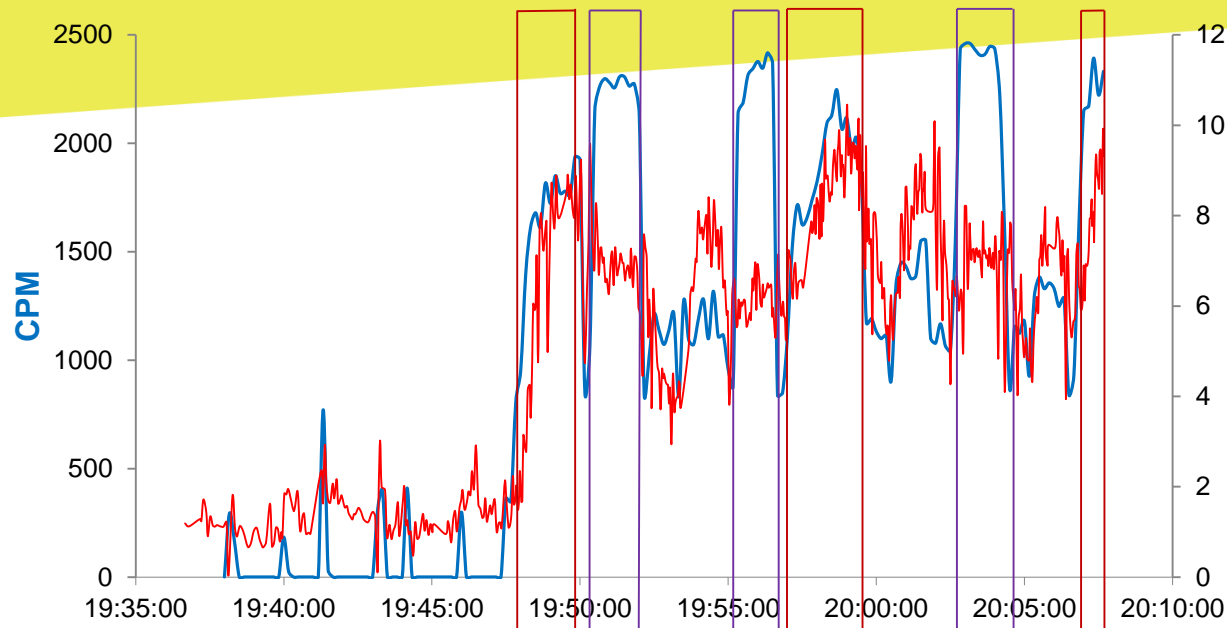


DIMENSION A: INTENSITY ZONES

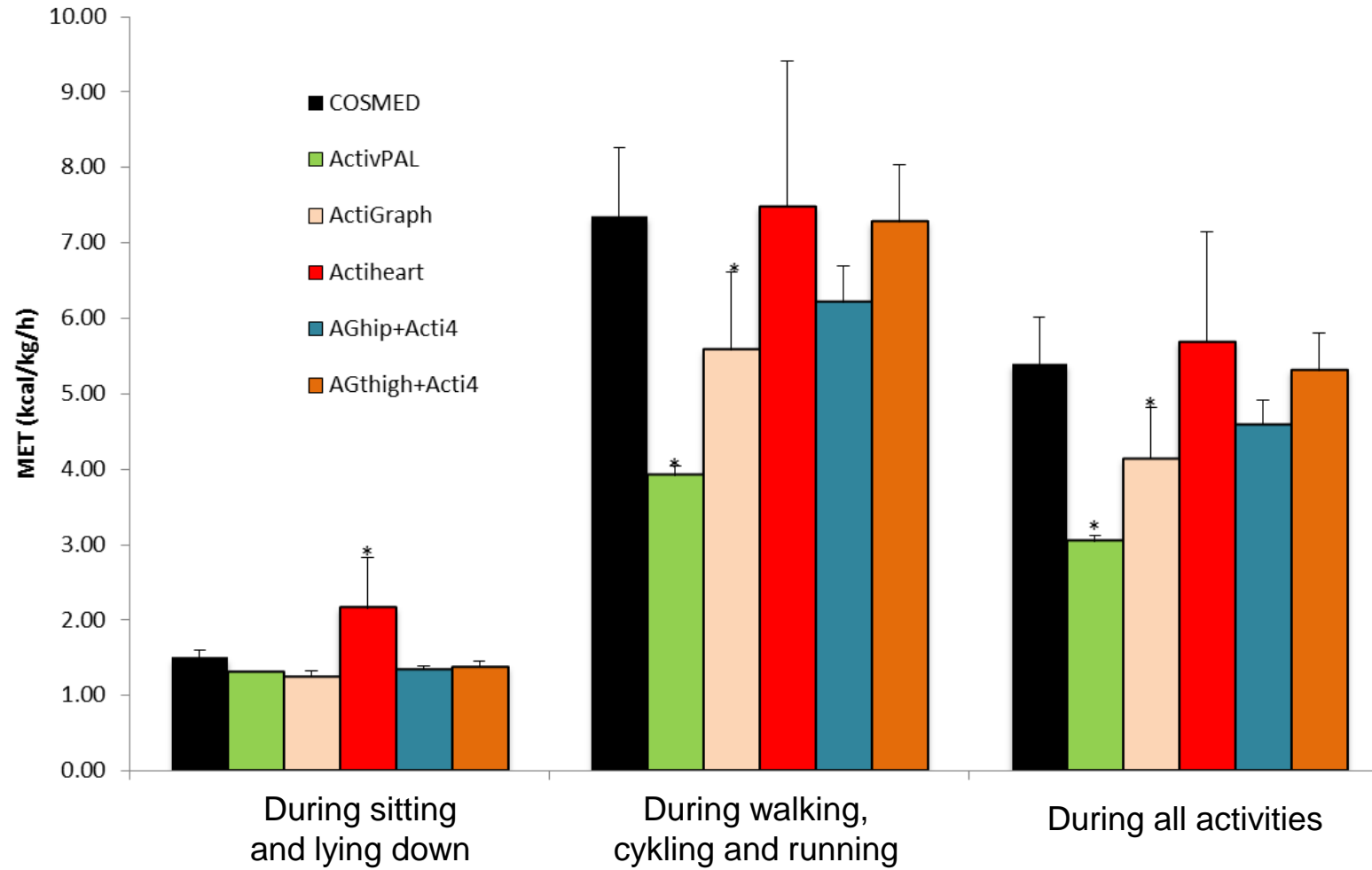


Dimension A: Intensity zones





Energy expenditure



Dimension A: Intensity zones

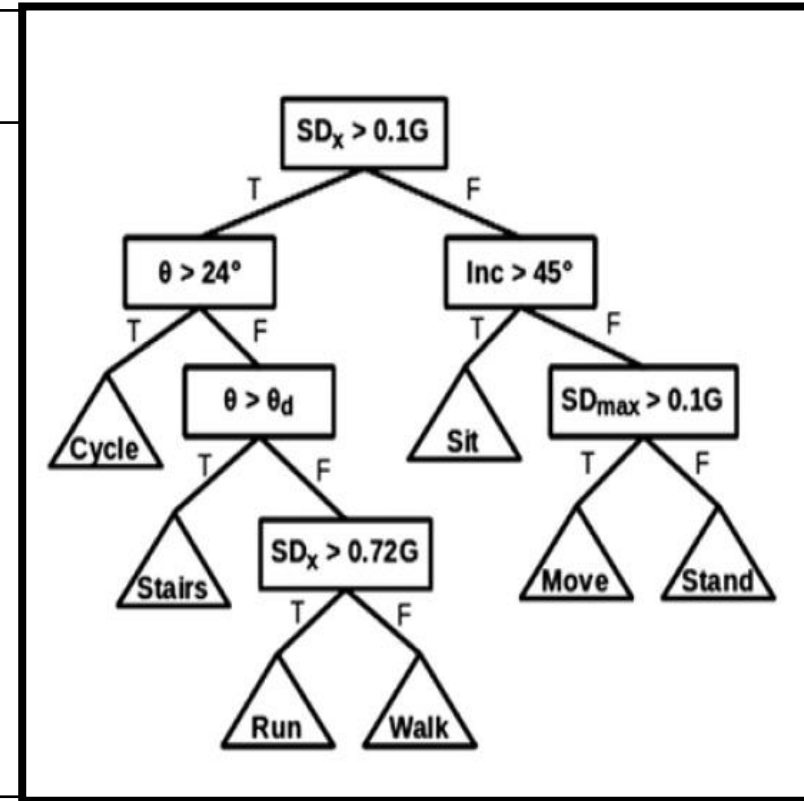
- Can be attained by accelerometers, either by
 - CPM
 - Only using info of physical activity types and postures
 - Combination of physical activity types and CPM
 - Other?
- Nice to have (needs to be developed):
 - High intensity incidental physical activity (HIIPA)
 - Other?



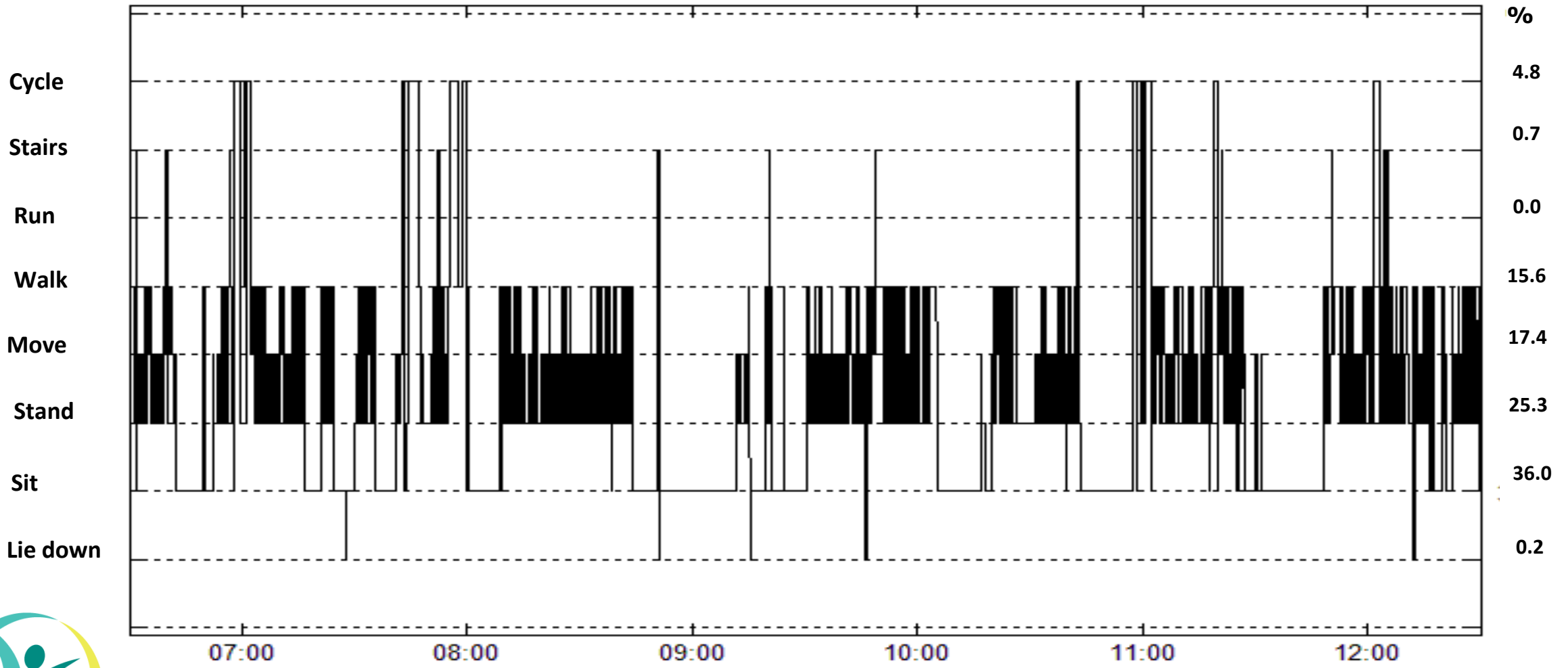
Dimension B: Physical behavior types

Thigh-worn accelerometry of physical activity types and postures

Activity	Sensitivity (%)	Specificity (%)
Sitting	99.9	100.0
Standing	100.0	100.0
Walking	99.4	99.7
Running	98.7	99.9
Stairs	95.3	100.0
Cycling	99.9	100.0

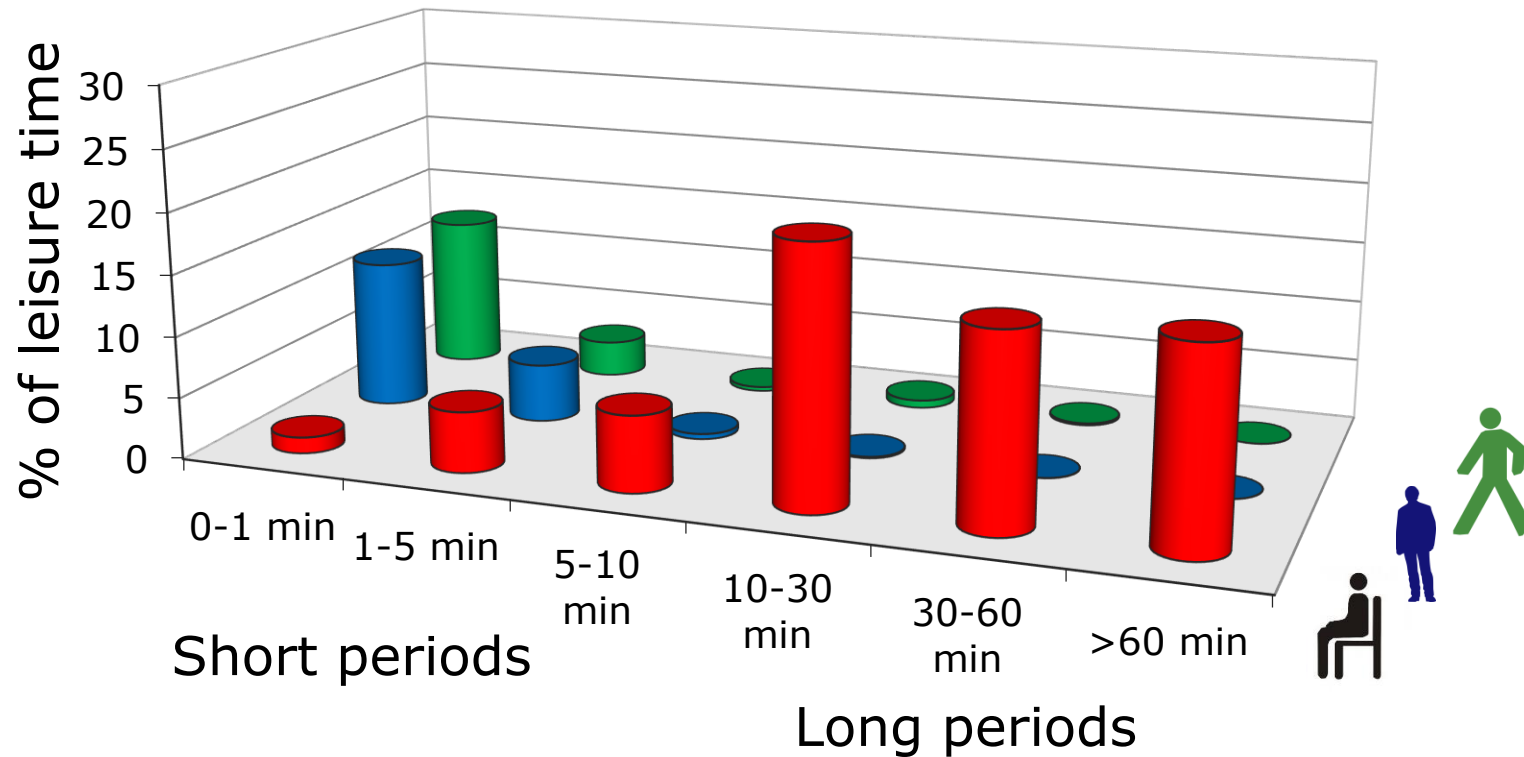


Dimension B: Physical behavior types



Physical activity types and postures among a homecare worker

Dimension C: Time patterns

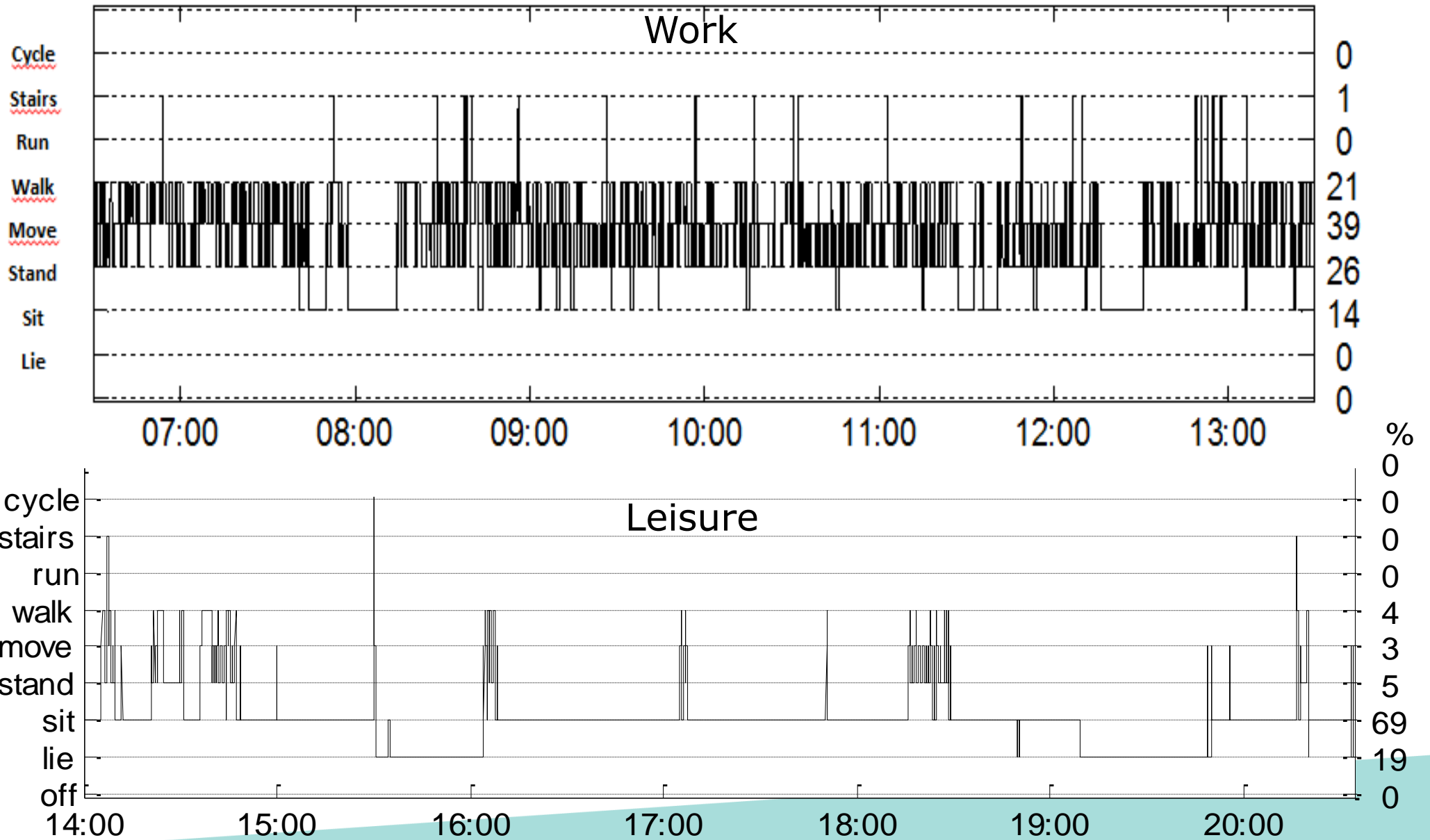


Time-pattern of physical activity type and sitting using Exposure-Variation-Analyses

Hallman et al 2015

Dimension D: Domain

Cleaner



Dimension D: Domain

- Normally measured by self-reported diary
- Can it be estimated by accelerometers?



Dimension E: Biological state

- Accelerometer methods shown rather good estimates of sleep duration (onset – end sleep)
- How good can the estimates be, and can other sleep related attributes be measured by accelerometers, for example by Machine Learning methods?



Dimension F: Profiles

