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P1752.2 Metabolic Subgroup Meeting

Working Group Sponsored by IEEE Engineering in Medicine & Biology (EMB) Standards Committee

11 June 2024

Teleconference

Agenda

1. Attendance
2. Review of action items
3. Review of tasks
4. Other business

Review of Tasks

Action Items (I)

Investigate bio buttons for temperature (skin temperature) [*in progress*]

Basal body temperature (BBT) is defined as the lowest natural, non-pathologic body temperature recorded after a period of rest.

Core temperature reflects the temperature of the internal organs. The precision of temperature monitoring depends on the measurement site and the measurement system. Four monitoring sites are considered to be T_c sites: the tympanic membrane, nasopharynx, esophagus, and pulmonary artery [source]

2021 paper in Biology reports results of evaluations of different thermometers and points at tympanic thermometers as being the most accurate commercially available system for the measurement of body temperature.

A comparison of forehead, axillary, and oral temperature measurements at different ambient temperatures pointed at forehead temperature being more sensitive to ambient temperature [source]

2023 paper questioning the historical value used for "normal" oral temperature

Action Items (II)

Some solutions provide to user temperature difference (deviation) rather than absolute temperature. E.g.,

Oura ring
Focus on (skin) temperature changes
API lists body_temperature, temperature_deviation and temperature_trend_deviation as part of the concept or readiness
temperature_deviation, shown as daily view, "focuses on short-term temperature changes"
temperature_trend_deviation "each date displays a weighted average of how your body temperature varies from your baseline based on a three-day window"

Apple Watch (series 8, 9)
Wrist temperature focuses on delta, displayed as change from baseline, where the baseline is defined as "an average of recent measurements taken during sleep"

Withings Watch
Temperature (calculated using 4 inputs) starts at a "standard" value then is calibrated based on repeated measurements (in 15 minutes). Body temperature is displayed as variations from the baseline (+/-)

Action Items (III)

FitBit

Allows manual entry of body temperature measured with a separate thermometer → tempCore

Some models check skin temperature every minute during sleep. With skin temperature data for at least 3 days, they estimate baseline temperature, then use up to 30 days of data to adjust baseline temperature.

tempSkin : value : nightlyRelative - The user's average temperature during a period of sleep.

It is displayed to the user as a delta from their baseline temperature

Pixel 8 Pro

Thermometer app (FDA cleared) lets person take their temperature with a forehead scan and save results to their Fitbit profile.

Measurement location schema

Action item: merge into a value-set schema to be used as needed

[see attached partial list]

Summary of Action Items

Next Meeting

Upcoming Meeting

- Metabolic subgroup:
  - Tuesday, July 9 at 8 am Pacific