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P1752.2 Metabolic Subgroup Meeting

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

5 April 2022

Teleconference

Agenda

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

Summary of work done so far

- Focus on Blood Glucose measures
- Are there gaps in what we have considered so far?
- https://docs.google.com/document/d/1SevoVr9WGjZYvfk92fZvzCAKOPhuk7EbgHTyBRbUXfg/edit#
- Devices
- Data Aggregators
- Other models, e.g., FHIR http://hl7.org/fhir/observation-example-f001-glucose.html

Data elements to model (I)

- Glucose (mg/dL)
- Time in range (%) [TIR] http://www.agpreport.org/agp/agpreports
- Time above range [TAR]
- Time below range [TBR]
- Mean glucose (average)±standard deviation

Data elements to model (II)

- Percentage coefficient of variation for glucose (%CV = [(SD of glucose)/(mean glucose)]
- Glucose Management Indicator (GMI)
  tells you the approximate A1C level based on the average glucose level from CGM readings for 14 or more days (eA1C → GMI)
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6196826/
- Number of hypo/hyper events / Timestamps of alarms
  [to be defined more precisely]
- Reference ranges (for hypo/hyperglycemia)

Additional measures (?)

- Average daily carbs (g)
- Mean amplitude of glycemic excursions (MAGE): the arithmetic mean of differences between consecutive peaks and nadirs of differences greater than one SD of mean glycemia
- Mean of daily differences (MODD): the mean of absolute differences between glucose values at corresponding time points of consecutive days)

Additional measures (metadata)

- Sensor usage (%)
- Calibration
- mean absolute relative difference (MARD) to characterise the accuracy of the “Different studies reported MARD values of 9.5% to 19% for different CGM sensors, which are close to the values reported for glucometers (5.6% and 20.8%).” https://www.nature.com/articles/s41598-019-56927-5
- CGMS can be intermittently scanned (isCGMS) or intermittently viewed, (ivCGMS) or real time (rtCGMS)
- Suggestion: add “calculated” to modality

Temporal relationships

- Temporal relationship to meal*
- Temporal relationship to sleep*
- Temporal relationship to physical activity
  - e.g., before exercise, after exercise (see related OMH schema)
- Temporal relationship to doses of antihyperglycemic medications (?)

*These elements are present in the Open mHealth blood glucose schema

Suggestion: temporal relationship to event

Looking ahead

- Focus on Body Weight measures
- https://docs.google.com/document/d/1NTLUe7TaVnUkJoFGt1_Xy-tE-c_JFt3fHXA8-xUJXZE/edit
- Use cases?

Review of Tasks

Summary of Action Items

Next Meeting

Upcoming Meeting

- Metabolic subgroup:
  - Tuesday, May 10 at 8 am Pacific