

P1752.2 Metabolic Subgroup Meeting

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

19 July 2022

Teleconference

Agenda

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

Review of Tasks

Next steps

- Update Open mHealth blood glucose schema as needed
- Draft additional schemas
- Model data elements for possible addition to 1752.1 header schema

- Resources for volunteers
 - [Understanding JSON Schema](#) document on [JSON Schema website](#)
 - Existing [IEEE 1752.1 schemas](#)
 - Existing [Open mHealth schemas](#)

Open action items from previous calls

- Add a ReadMe file in the iMeet schema folder DONE
- Analyze FHIR observation resource wrt concentration (to follow up on proposal to have a concentration unit-value schema)
 - <https://build.fhir.org/observation.html>
 - <https://build.fhir.org/datatypes.html>
 - OMH medication schemas (strength, dose)
 - concentration ratios where the denominator is significant

Open action items from previous calls

- Develop a step-by-step how-to for schema development → use existing Open mHealth documentation
<https://www.openmhealth.org/documentation/#/schema-docs/write-a-schema>
- apply it to blood glucose schema
https://www.openmhealth.org/documentation/#/schema-docs/schema-library/schemas/omh_blood-glucose
- together with conventions used in published IEEE schemas, like
<https://opensource.ieee.org/omh/1752/-/blob/main/schemas/environment/ambient-temperature-1.0.json>
- but start with sample data
<https://ieee-sa.imeetcentral.com/omh/folder/WzlwLDE0MDczMTQ5XQ/>

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) \pm standard deviation

Data elements to model (II)

- Percentage coefficient of variation for glucose ($\%CV = [(SD \text{ of glucose}) / (\text{mean glucose})]$)
- 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 \rightarrow 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
- Rate of Increase
- Rate of Decrease

Additional measures (metadata)

- sensor usage (%)
- calibration status
- mean absolute relative difference (MARD) for accuracy (device-specific)
- number of scans (during a time period)
- sensor location, specimen source, sample location
- battery

Suggestion: amend header schema property *modality* value set to have the following items:

- device generated
- user reported

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](#)

Proposal to have a generic *temporal relationship to event* property requires additional discussion

Summary of Action Items

Next Meeting

Upcoming Meeting

- Metabolic subgroup:
 - Tuesday, August 23 at 8 am Pacific