P1752.2
Cardiorespiratory Subgroup Teleconference

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

June 30, 2022
15:00 UTC
Agenda

June 30, 2022

Attendance

Review of prior minutes

Discussion: Proposal of use cases
  • Quantified self
  • Health care: Burden of AF

Tasks: Discussion of next steps

Other business
  • Repository of references, resources, drafts
  • Stakeholders update
  • Next meeting
Approval of Prior Minutes?

- (nuts & bolts: summarization of data repository options)

- May 26, 2022
Scope
The P1752.2 Cardio–Respiratory (CR) Subgroup will review Open mHealth schemas related to CR measures and propose updates and additional schemas as needed. The scope includes but is not restricted to the following measures of CR health: blood pressure, heart rate, heart rate variability, RR interval, respiratory rate, and O2 saturation. The focus of this Subgroup’s work is on modeling data pertaining to CR function, not on current or future individual devices or apps that measure various aspects of CR health.

Duties
By reviewing the clinical aspects of cardio–respiratory health and existing relevant devices and apps, the Subgroup shall deliver a list of common attributes as well as a list of clinically important attributes in the cardio–respiratory domain as scoped above. The Subgroup shall propose modified and new schemas relating to CR health, including examples as informed by use cases and the list of common and clinically important attributes. Finally, the Subgroup shall deliver a review of mappings and/or relationships to non–Open mHealth CR schemas.

https://sagroups.ieee.org/1752/cardio-respiratory-subgroup/
# Important Cardiorespiratory Health Measures

(Relevance of Each Access Use Cases)

<table>
<thead>
<tr>
<th>Associated Health Condition</th>
<th>Blood pressure</th>
<th>Heart rate</th>
<th>RR interval</th>
<th>Heart rate Variability</th>
<th>O2 saturation</th>
<th>Respiratory rate</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUANTIFIED SELF</td>
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<tr>
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</tr>
</tbody>
</table>

*Use Cases* … and add other clinically important attributes identified
Use case paradigms for developing P1752.2

Athleticism
- Fitness
- Performance

Self Care
- Health Maintenance
- Wellness

Health Care
- Chronic Disease Monitoring
- Post-Intervention Recovery

Maintain alignment with existing

DiMe Society Playbook
- Clinical Research
- Clinical Care
- Public Health
<table>
<thead>
<tr>
<th>Device</th>
<th>Endpoint Description</th>
<th>Study Duration</th>
<th>Monitoring Device</th>
<th>Other Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoll</td>
<td>Mean nocturnal HR &lt;70</td>
<td>90 days</td>
<td>Heart rate monitor</td>
<td>Device (“Lifevest”)</td>
</tr>
<tr>
<td>Edifice</td>
<td>Change in HR variability</td>
<td>Study duration</td>
<td>Heart rate monitor</td>
<td>Drug</td>
</tr>
<tr>
<td>Marrek</td>
<td>% atrial fibrillation</td>
<td>24-48 hr</td>
<td>Heart rate monitor</td>
<td>Other</td>
</tr>
<tr>
<td>UltraGenyx</td>
<td>Seizure detection via change in HR</td>
<td>Up to 8.5 months</td>
<td>PPG (heart rate monitor)</td>
<td>Drug</td>
</tr>
<tr>
<td>Avazzia</td>
<td>Change in physio stress response</td>
<td>?</td>
<td>PPG (heart rate monitor)</td>
<td>Device</td>
</tr>
</tbody>
</table>

Heart rate digital end point reported in 7 of 325 studies listed
Measuring health using digital sensing products offers a more holistic view of a person’s lived experience.
Open mHealth

Schema: Heart Rate - (v2.0)
**Open mHealth**

**Schema: Rr Interval - (v1.0)**

```json
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description": "This schema represents the time measurement between the R wave of a person's successive heartbeats.",
  "type": "object",
  "references": [
    {
      "description": "The NCIT code represents the time measurement between the R wave of successive heartbeats as measured in milliseconds."
    },
  ],
  "definitions": {
    "duration_unit_value": {
      "$ref": "duration-unit-value-1.x.json"
    },
    "time_frame": {
      "$ref": "time-frame-1.x.json"
    },
    "descriptive_statistic": {
      "$ref": "descriptive-statistic-1.x.json"
    },
    "temporal_relationship_to_physical_activity": {
      "$ref": "temporal-relationship-to-physical-activity-1.x.json"
    }
  },
  "required": ["rr_interval"]
}
```
Open mHealth

Schemas:Granola - (v1.1)

(Apple HealthKit)

Hk blood type
Hk category sample
Hk category type
Hk correlation
Hk correlation type
Hk metadata
Hk quantity sample
Hk quantity type
Hk workout

"HKQuantityTypeIdentiﬁerHeartRate"
- one of 57 enumerated quantity types
1. Deliver a list of common attributes as well as a list of clinically important attributes in the cardio–respiratory domain.

2. Propose modified and new schemas relating to cardiorespiratory health, including examples as informed by use cases and the lists of common attributes and clinically important attributes.

3. Deliver a review of mappings and/or relationships to other existing cardiorespiratory schemas other than that of Open mHealth.
Cardiorespiratory Use Cases

Athleticism (fitness and performance)

Wellness & health maintenance (self care)

Health care

• Clinical care  examples
  Atrial fibrillation burden
  Palpitations
  COPD
  Asthma
  Hypertension
  Heart failure
  Presyncope & syncope
  Post-operative recovery monitoring
  Post-stroke monitoring
  ...

• Public Health
• Clinical research
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*Use Cases... and add other clinically important attributes identified*
IEEE P1752.2 CARDIORESPIRATORY - SCHEMA DEVELOPMENT

- Usage cases under active development
- Focus on identification of key data types
- Coherent across broad usage paradigms
- Identify and broaden participation of stakeholders

IEEE STANDARDS ASSOCIATION
P1752.2
Cardiorespiratory Subgroup

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June 30, 2022
Next meeting **July 28 (15:00 UTC)**