

P1752.2

Cardiorespiratory Subgroup Teleconference

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

May 4, 2023
8 AM PDT; UTC 3:00 PM

P1752.2

Cardiorespiratory Subgroup

Agenda

May 4, 2023

Attendance & Introductions

Items:

- ✓ Preparation (session March 7, 2023):
 - Review JSON schema coding
 - Informed by IEEE 1751.1 schemas
 - Esp familiarize with “Metadata” and “Utility” schemas
 - Consider: *Samples -> Schemas*
- ✓ Assessing dependencies: Organization of CR schema
- ✓ CR schema structure

Other business

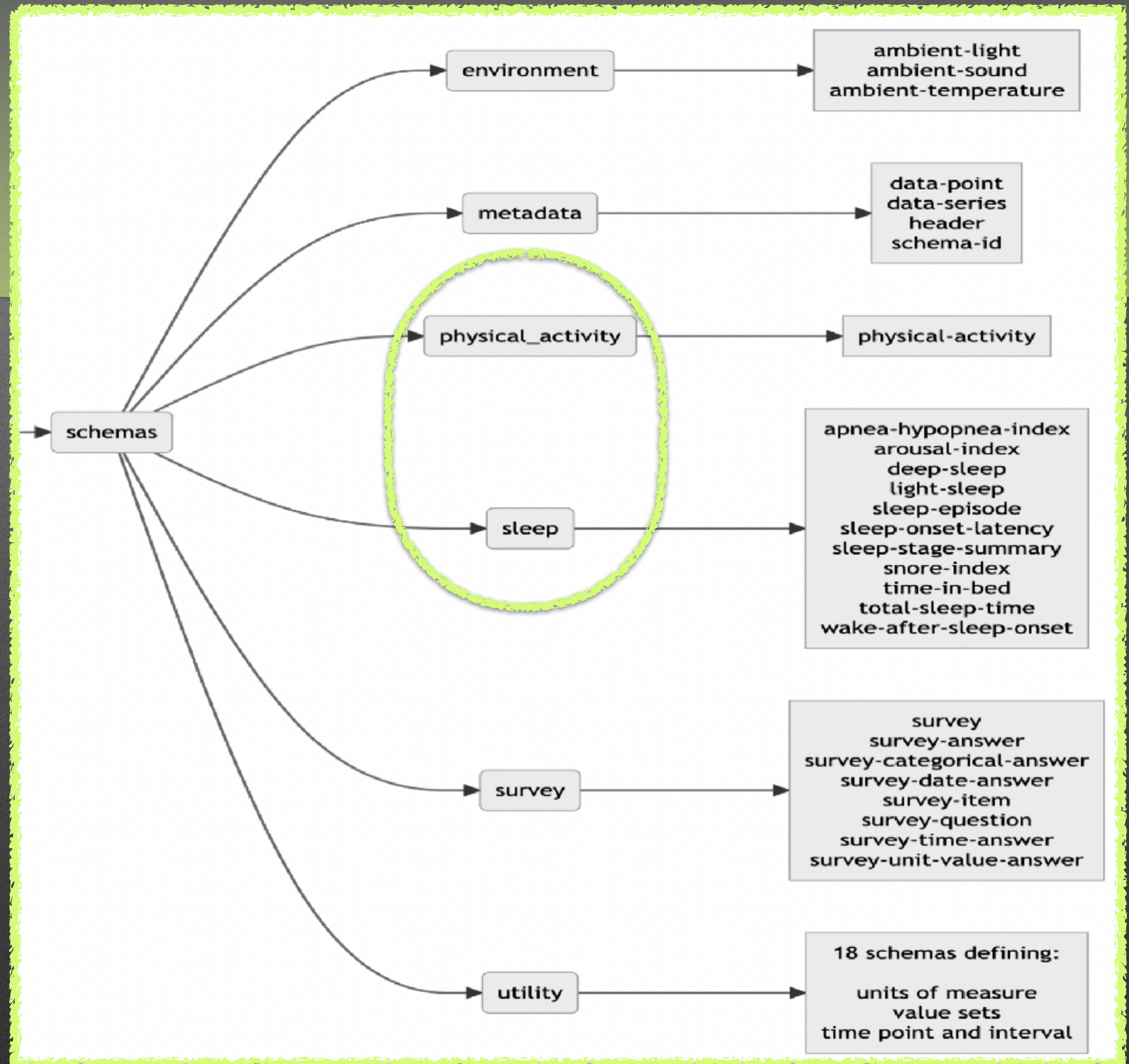
- ✓ Subschema groupings
 - ✓ Schema timeline / initial draft target
-

IEEE 1752.1 Standard for Mobile Health Data

+

IEEE 1752.2 Standard for Mobile Health Data

- *Metabolic*
- *Cardiorespiratory*



Impactful Healthcare

Relevance

Morbidity & mortality
... WHO category of highest consequence

Cardiovascular disease #1

cerebrovascular

heart failure

dysrhythmias

Hypertension

Preventative medicine
... overall intervention of highest impact

Physical activity & mvt

CR fitness

Health care delivery & economics
... need for digital biomarkers with

- semantic interoperability
- contextuality

Apps

Wearables & ext. detectors

Internal/implant sensors*

Cardiorespiratory Schema

Proposed Structure

*Electrical
Systoles*



Pulse



**Pulse
Dynamics**



Rhythm

Blood Pressure

- *Systolic, diastolic*
- *Cardiodynamics*

Respiratory

- *Ventilatory
dynamics*
- *Gas Exchange*
- *Anomalies*

SCHEMA DESIGN PRINCIPLES

Atomicity ←

- *Determine desired granularity of schema's data representations*

Balancing parsimony and complexity ←

- *Pragmatics and the 80/20 rule*
- *Example: OmH explicitly determined relationship of physical activity to glucose to be outside 80/20 region...*

Balancing permissiveness and constraints

- *Pragmatics for value sets units, cardinality*

Designing for data liquidity

- *Data interchange: Data's **meaning** same for sender and receiver*
 - Header schema: Operational context for metadata - data payload
 - : *Data point creation and identification*
 - : *Acquisition provenance (informed by M2DK mPROV ?)*
 - Measurement schema: Clinical context for metadata

Alignment with clinical data standards

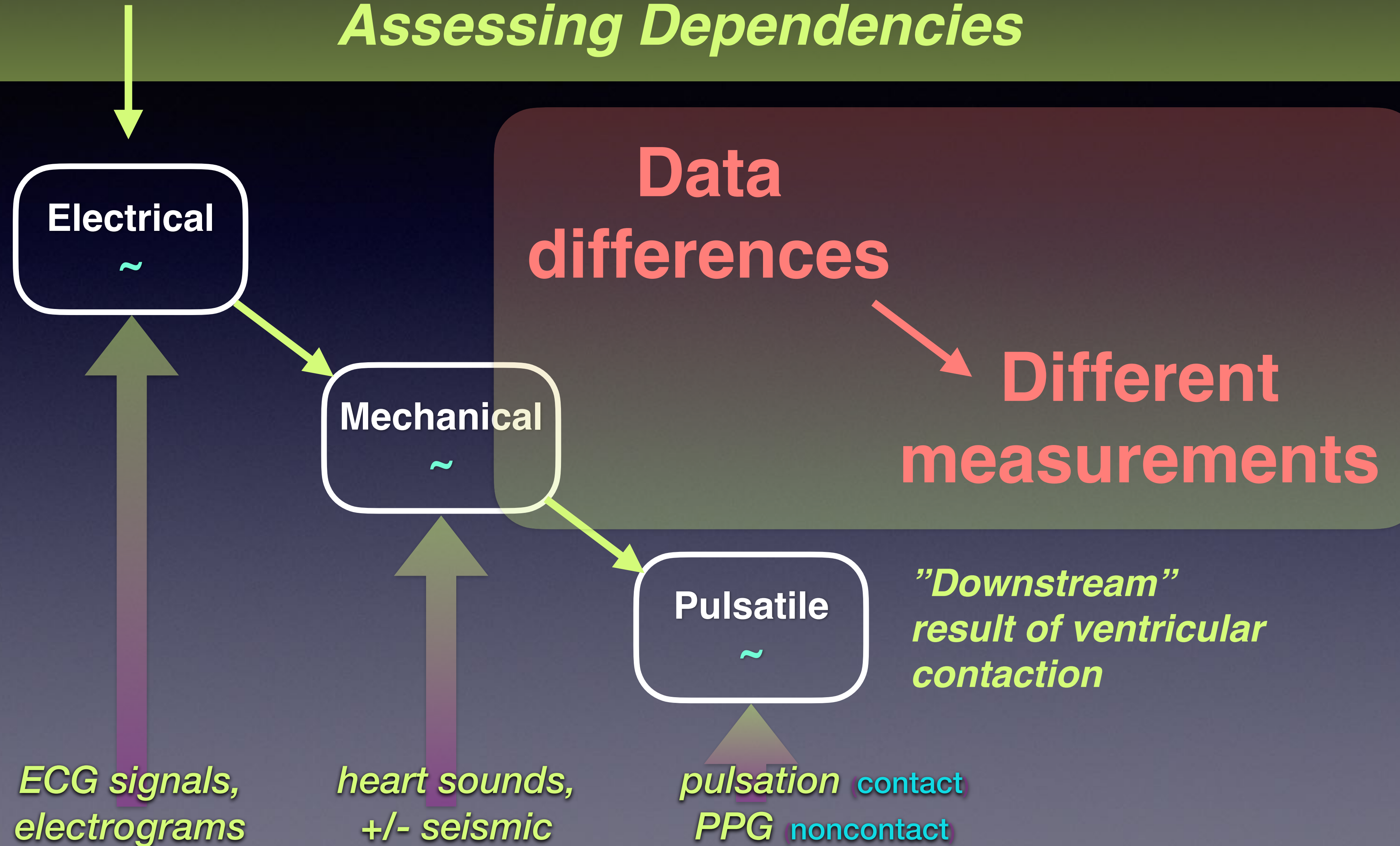
- ***Semantic interoperability** by relying on existing vocabularies (ex. SNOMED, LOINC, etc) and units of measure (UCUM Codes)*

Modeling of time

<https://www.openmhealth.org/documentation/#/schema-docs/schema-design-principles>

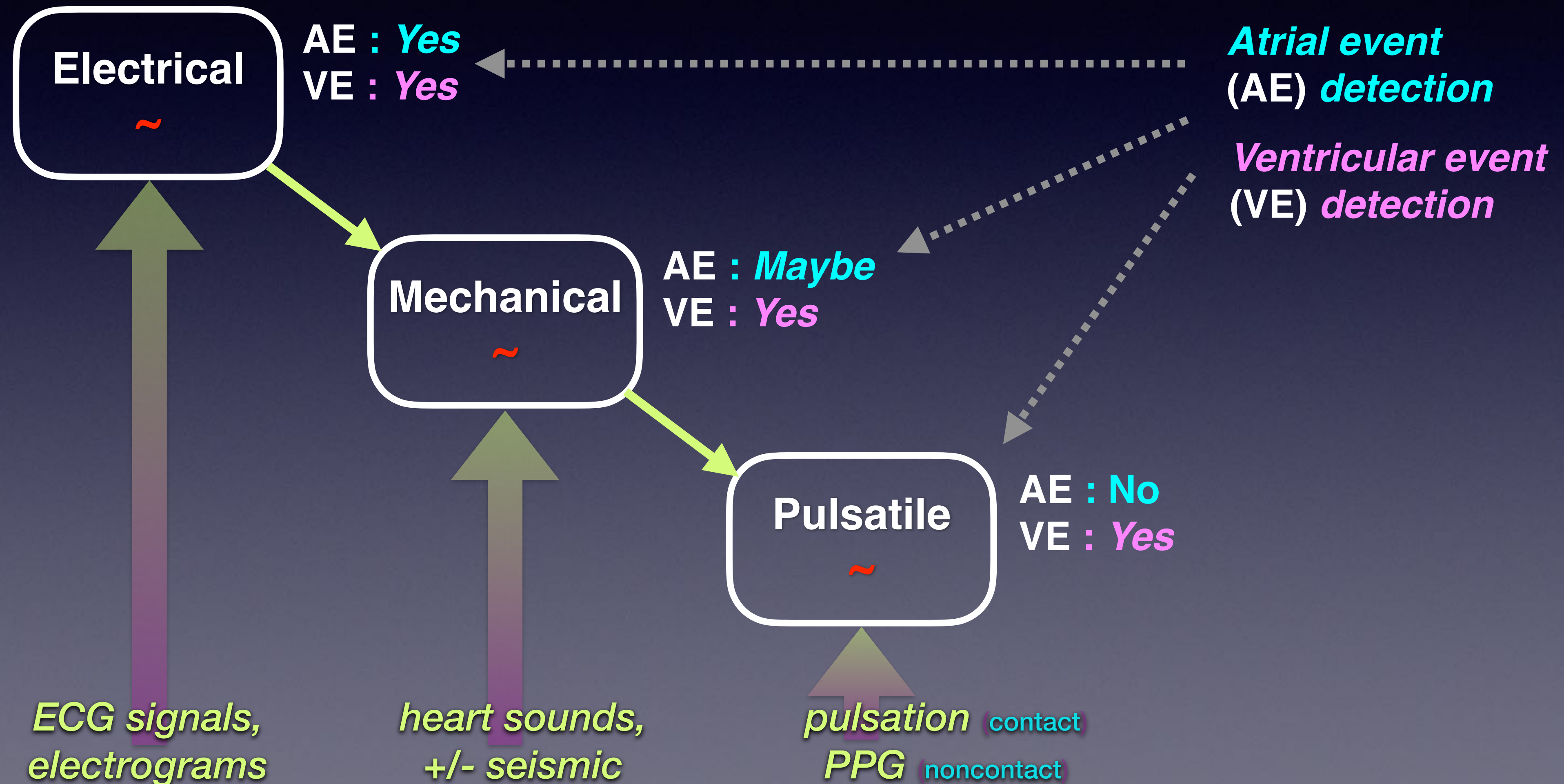
Cardiac Depolarization Event

Assessing Dependencies



Cardiac Systolic Event

Dependencies -> Extensibility



Compatible extensibility layers

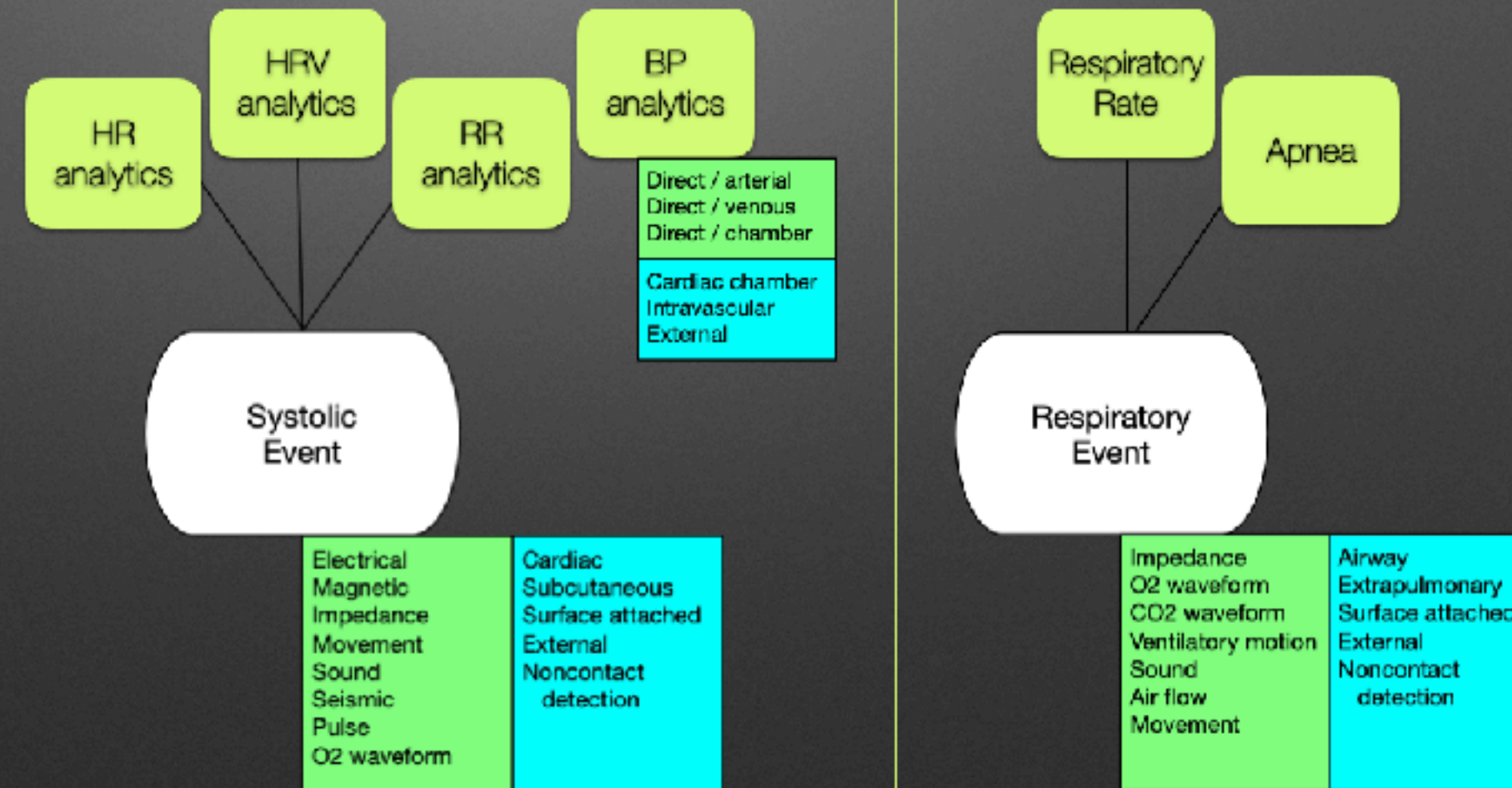
Future Proofing

Proposal

- Tiered Structure for the Cardiac Schema
- Separate schemas for Cardiac and Respiratory

Tier 1:
Derived or declared

Tier 0:
Currency
(granularity)



Enhancing clinical relevance

Examples :

- Differentiate atrial, atrial-paced, ventricular, ventricular paced (all types)
- Waveform morphology analytics