

# P1752.2

## Cardiorespiratory Subgroup Teleconference

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

June 22, 2023  
8:00 AM PDT; UTC 3:00 PM

# P1752.2

## Cardiorespiratory Subgroup

### Agenda

June 22, 2023

#### Attendance & Introductions

#### Items:

- ✓ Review scope & goals
- ✓ Subschema status updates
  - \* *Pulse & rhythm*
  - \* *Blood pressure & hemodynamics*
  - \* *Respiratory & gas exchange*
- ✓ Discussion:
  - \* *Needs*
  - \* *Identified challenges & roadblocks*
- ✓ Task: Subschema status updates

#### Other business

- ✓ Next CR subgroup meeting : July 27th -> **20th, 2023 ?**

# 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

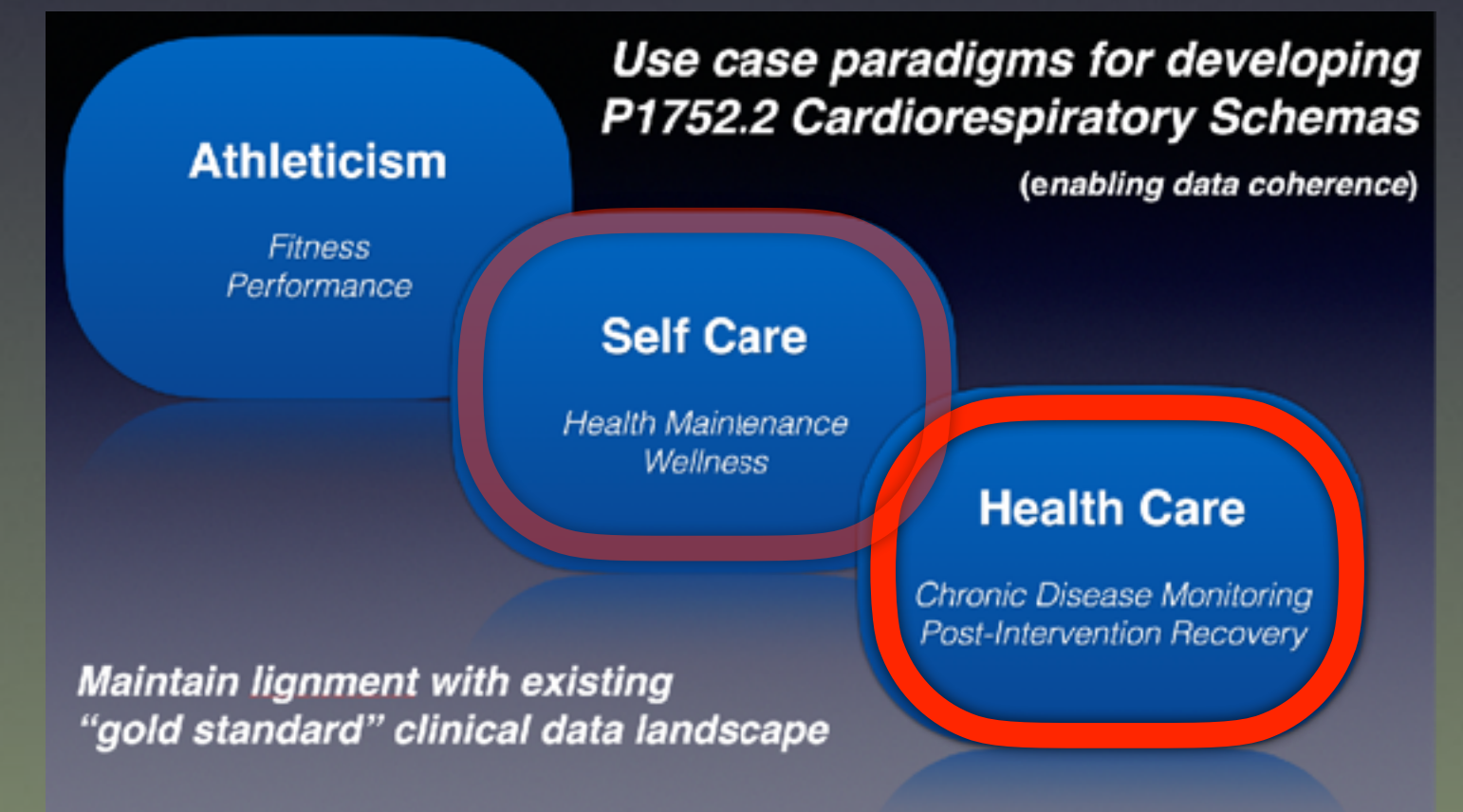
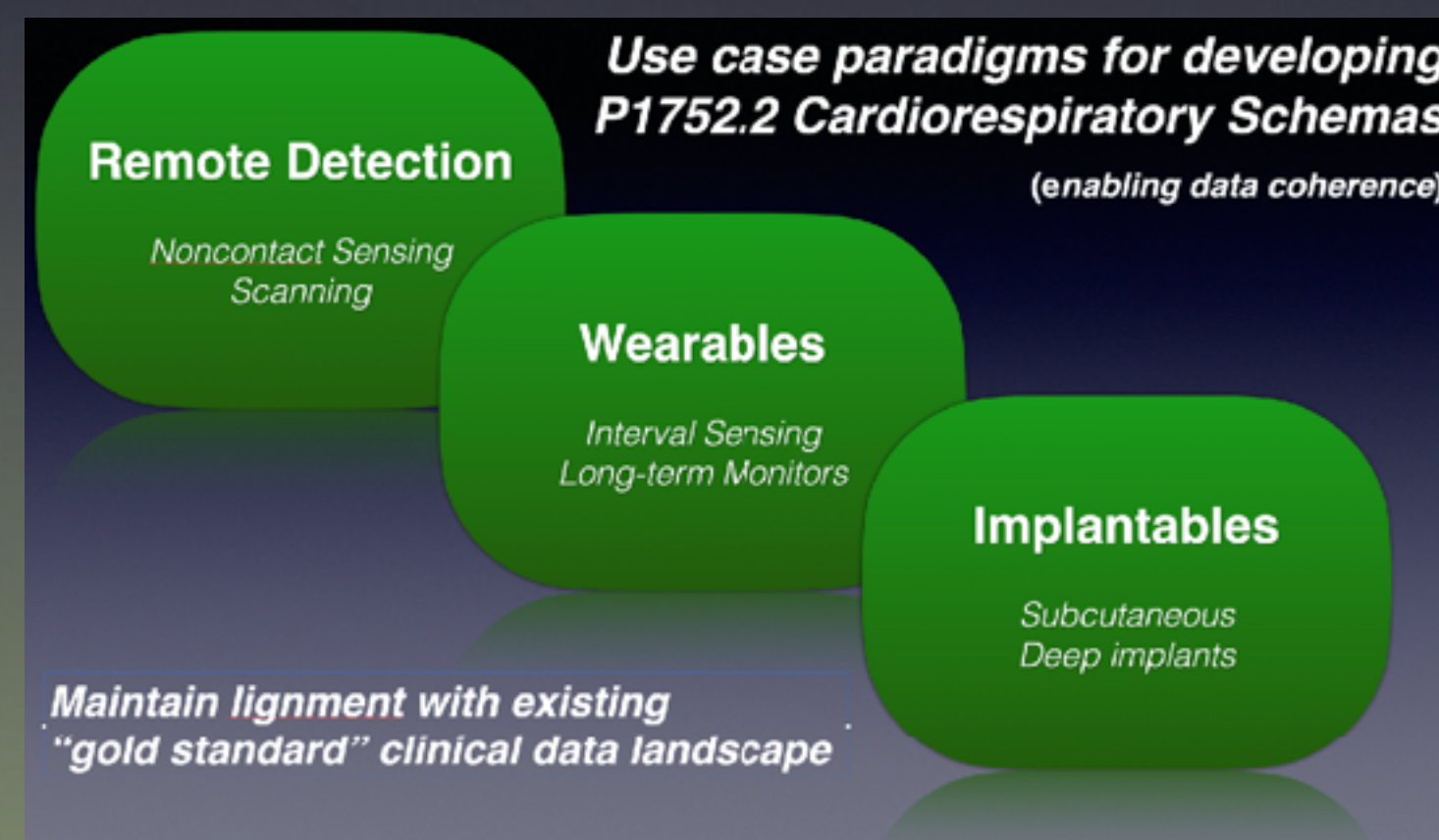
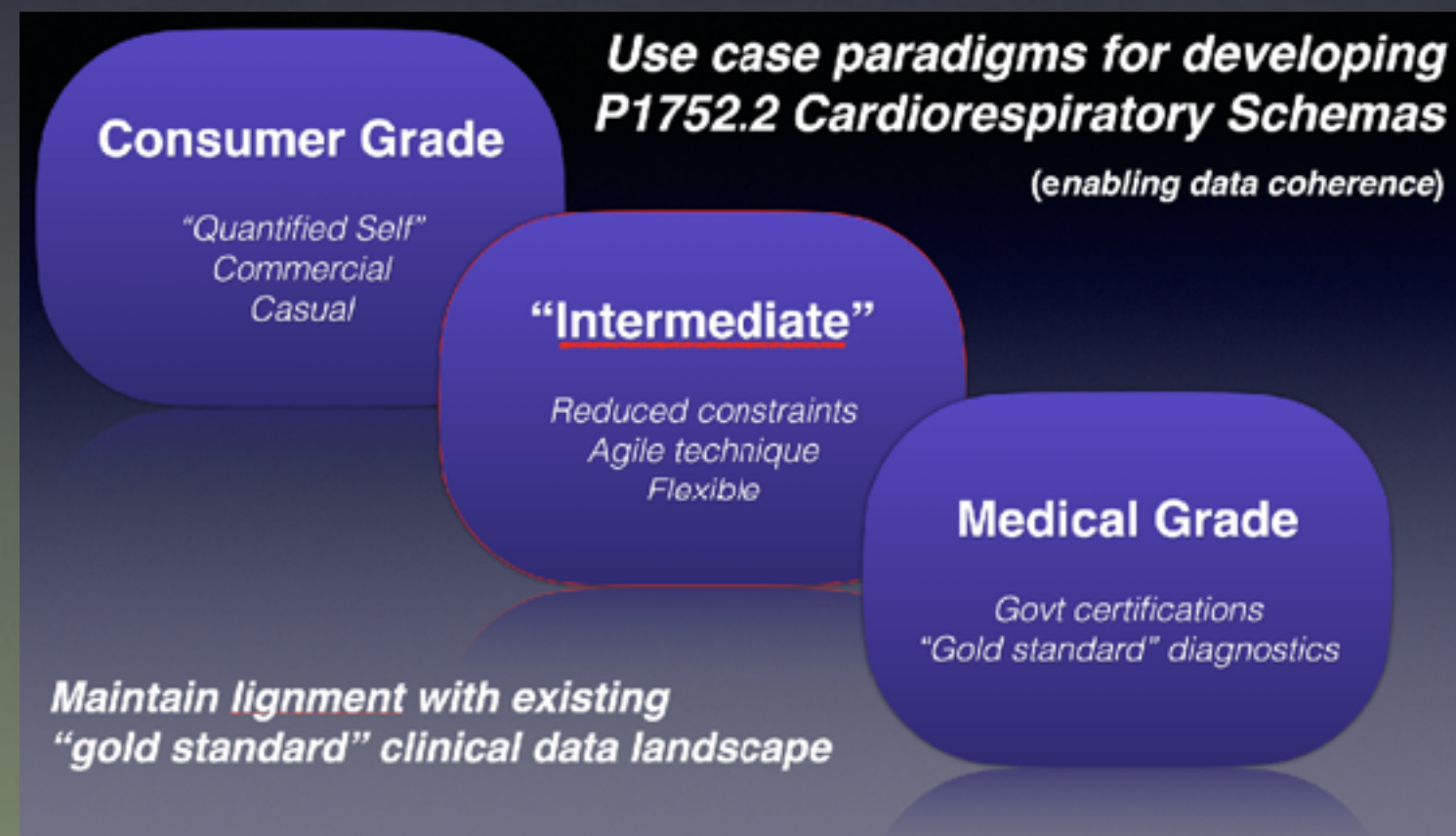
**Wearables & ext. detectors**

**Apps**

**Internal/implant sensors\***

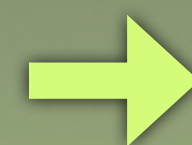
# P1752 Open mHealth Purpose:

- *The purpose of this Working Group is to provide standard semantics to enable meaningful description, exchange, sharing, and use of mobile health data across a wide spectrum of use cases addressing consumer health, biomedical research, and clinical care needs. These standard semantics will be in the form of common data and metadata schemas...* **Summary Addendum: Promotion of personalized healthcare**



## Present Trend:

Convergence of mobile health data with the digital biomarker space ...



## Current Need:

Accessing across all proveniences for a targeted health data type (provinence specified in metadata)

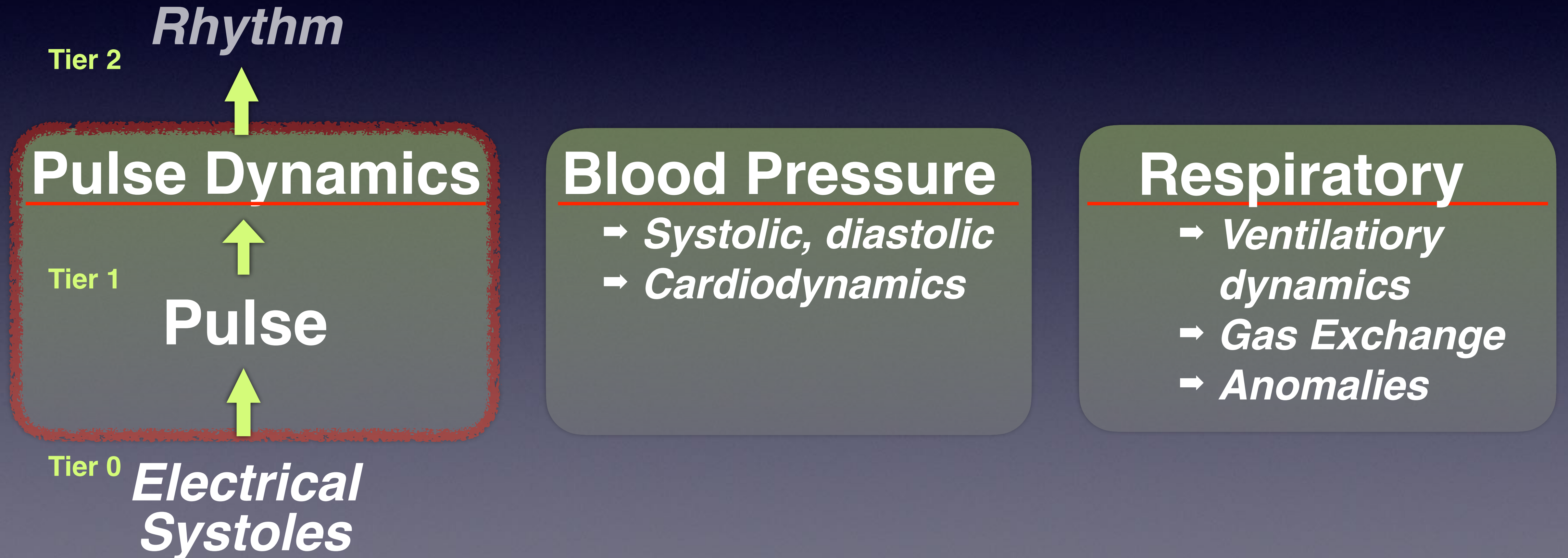


## Harmonization Ideal:

Enhancing relevance of data across *all use cases*, enabling contextualized continuous individualized care

# Cardiorespiratory Schema

## *Proposed Structure*



# Compatible extensibility layers

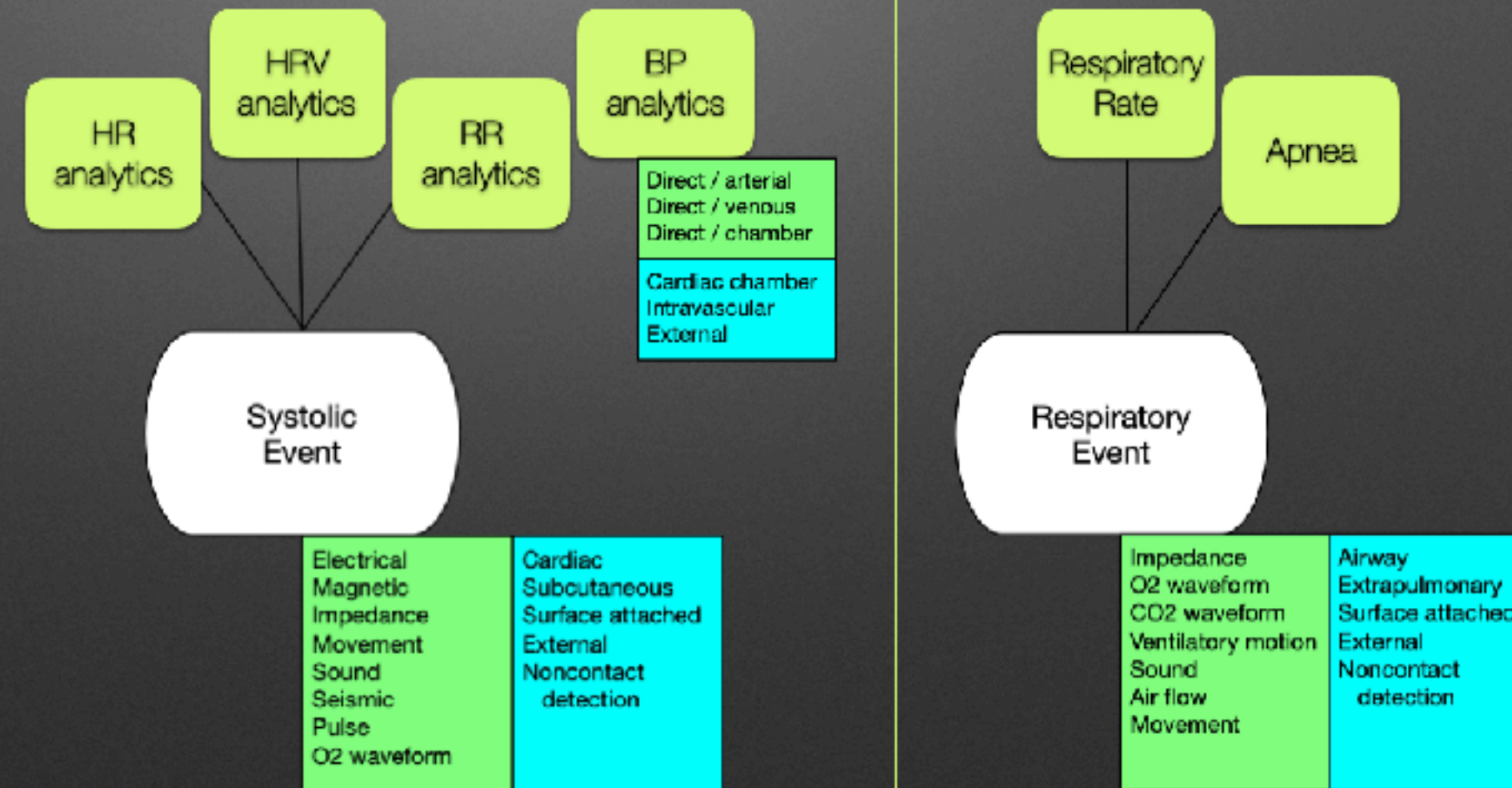
# Future Proofing

## Proposal

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

Tier 1:  
Derived or declared

Tier 0:  
Currency  
(granularity)



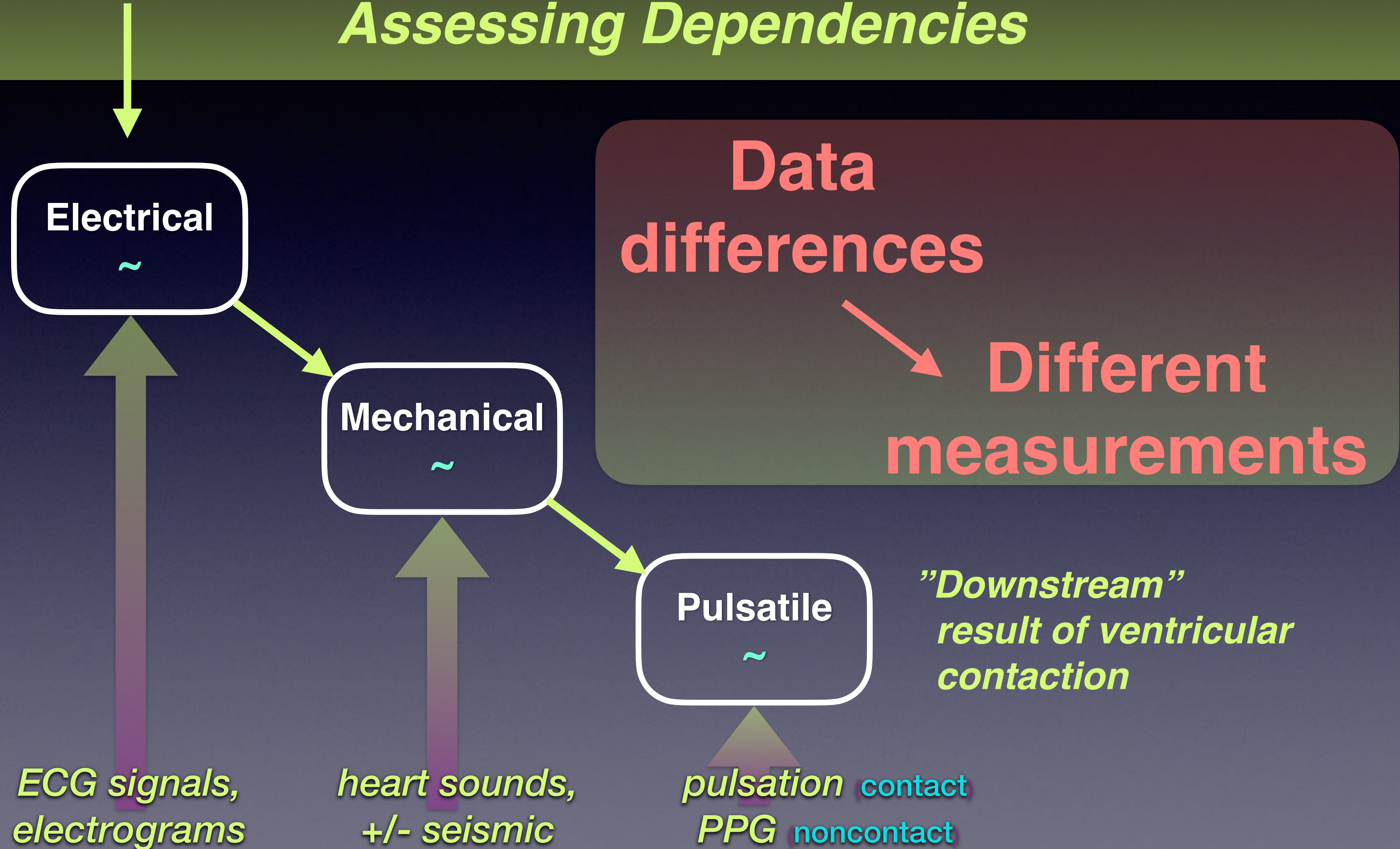
Enhancing clinical relevance

## Examples :

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

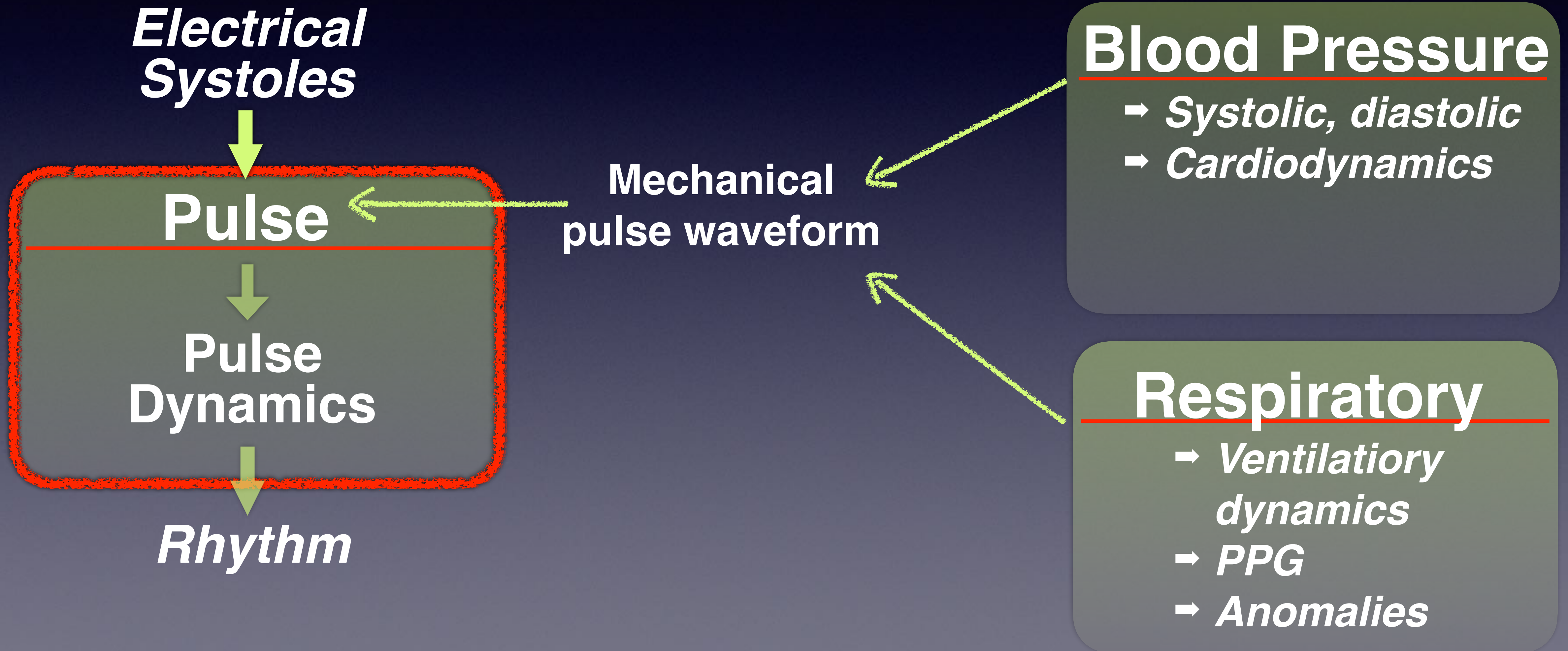
# Cardiac Depolarization Event

*Assessing Dependencies*



# Pulse Schema

## *Subschema Dependencies*





*Ventricular  
systolic  
event focus*

# Pulse Dynamics

Pulse rate at a given time

Semi-stationary pulse rate trends

Heart rate variability

- ▶ *Time domain, frequency domain, spectral turbulence*
- ▶ *Multiscale entropy*
- ▶ *Complexity index and fractal dimension*
- ▶ *Contextuality frameworks (provocations & modulators)*

Dysrhythmia states

*Pragmatically  
requires  
electrical  
sensing*

*Clinical utility  
dictates use of  
atrioventricular  
data and  
morphology  
data*