

P1752.2

Cardiorespiratory Subgroup Teleconference

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

November 17, 2022
17:00 UTC

P1752.2

Cardiorespiratory Subgroup

Agenda

Nov 17, 2022

Attendance

Consider approval of minutes from October 27, 2022

Prior minutes & slides / completed and posted

Discussion:

- ✓ Review

- *Exercise physiology*

- *Other considerations about cardiorespiratory fitness (CRF)*

- Health -> Aging and “pre”-disease -> Disease

- ✓ Use case example

Other business

- ✓ Collaborations / stakeholder engagements

- ✓ Next meeting : New proposal

Physical Activity

Overview



1. What happens during physical activity?
2. What happens during recovery from physical activity?
3. What are we capturing with mobile health?



Variables of interest:

- Hemodynamics (Q, BP, HR, TPR)
- Respiratory (Respiration Rate, Tidal Volume, Ventilation)
- Gas Exchange (VO_2 , VCO_2)
- Heart Rate Variability (HRV)
- Symptoms (Rating of Perceived Exertion, Dyspnea, Angina)



Physical Activity / Exercise

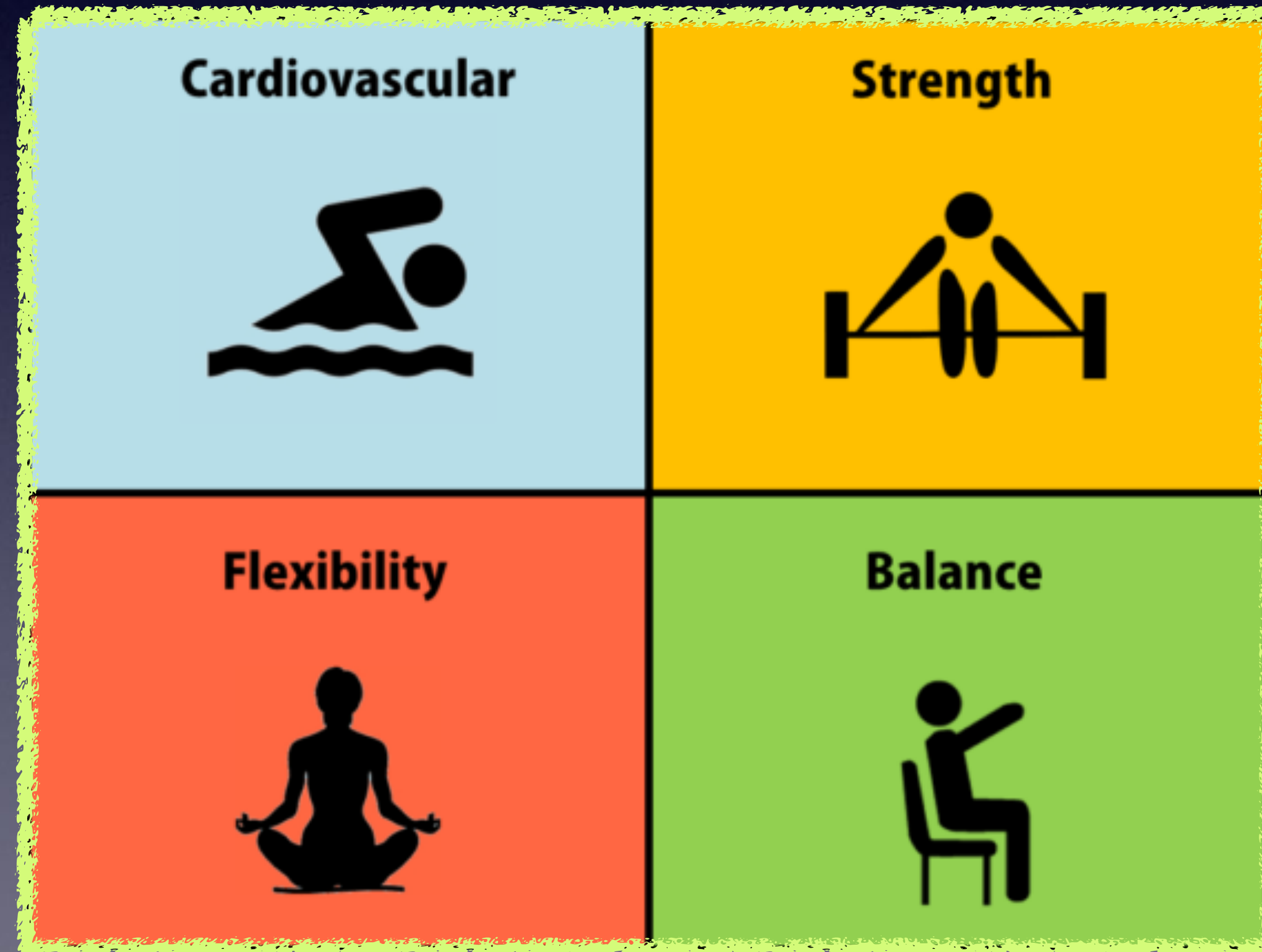
Cardiorespiratory

Intensity

General Classifications

Variables of Interest*

Movement
Light Activity
Aerobic Exercise
Vigorous Exercise



Hemodynamics

BP, P, TPR, Q

Respiratory

BP, P, TPR, Q

Gas Exchange

RR, TV, Ventilation

Autonomics

HR, HRV metrics

Symptoms

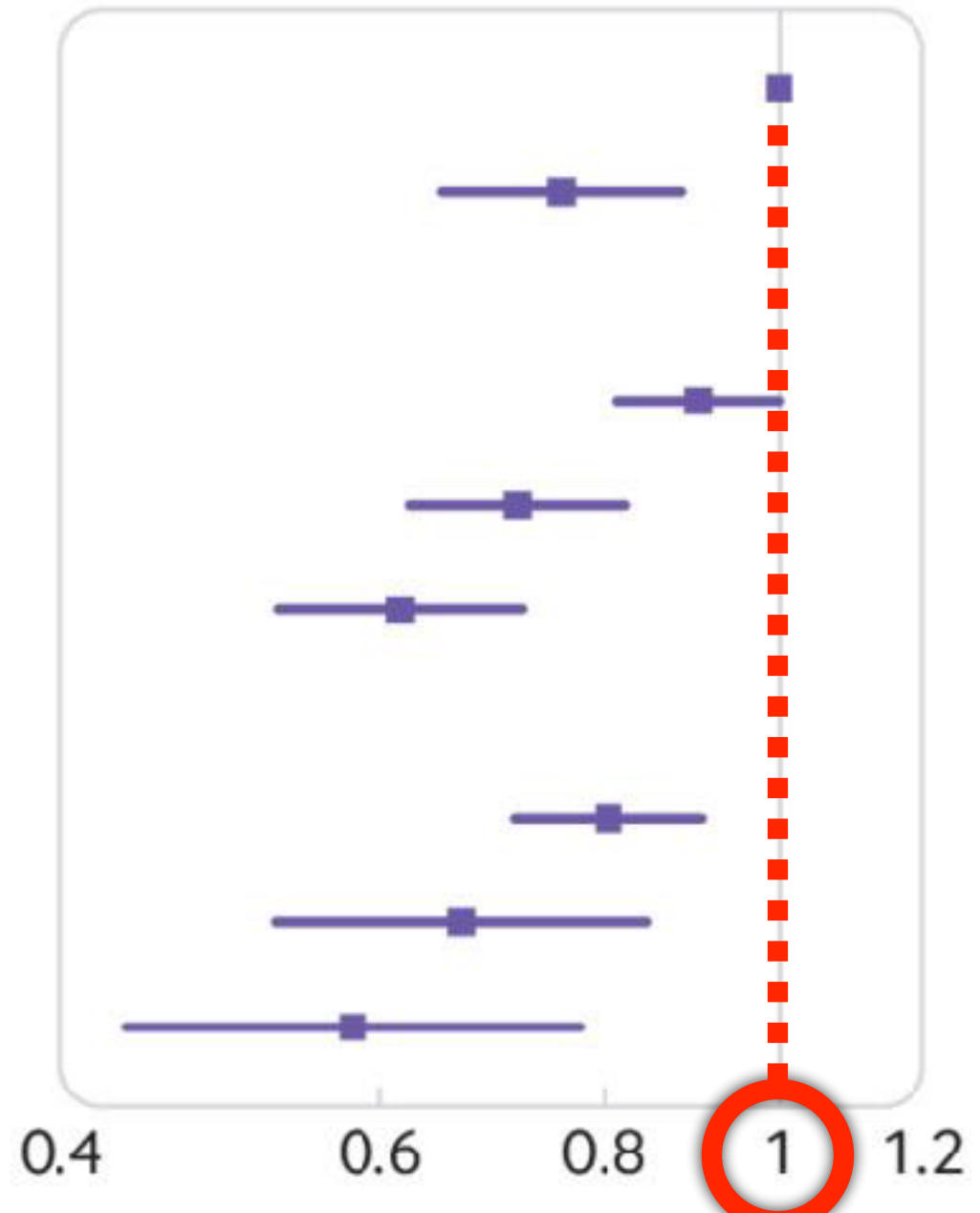
Rate perceived exertion

* Examples

Emphasis 1:

Physical Activity Trajectories and Mortality

Physical activity trajectory	Baseline PAEE (SD)	Most recent PAEE (SD)	No	Person years	Deaths	Adjusted mortality rate	Potential deaths averted (%)	Hazard ratio (95% CI)	Hazard ratio (95% CI)
Low									
Maintain	0 (0)	0 (0.4)	2207	23 613	842	2433	Reference		1.00
Increase	0 (0)	6.4 (3.2)	1127	13 270	210	1905	70 (10)		0.76 (0.65 to 0.88)
Medium									
Decrease	5.5 (1.6)	1.0 (1.9)	2606	29 727	709	2270	48 (7)		0.90 (0.81 to 1.00)
Maintain	5.5 (1.6)	5.3 (1.8)	1923	23 032	290	1811	143 (21)		0.72 (0.62 to 0.82)
Increase	5.5 (1.6)	10.0 (3.0)	1631	19 852	206	1583	169 (25)		0.62 (0.53 to 0.72)
High									
Decrease	11.9 (2.8)	5.0 (3.8)	2482	29 605	452	2081	104 (15)		0.80 (0.71 to 0.91)
Maintain	11.9 (2.8)	11.0 (2.7)	818	9987	81	1678	75 (11)		0.67 (0.53 to 0.84)
Increase	11.9 (2.8)	14.4 (3.1)	566	6988	50	1439	69 (10)		0.58 (0.43 to 0.78)

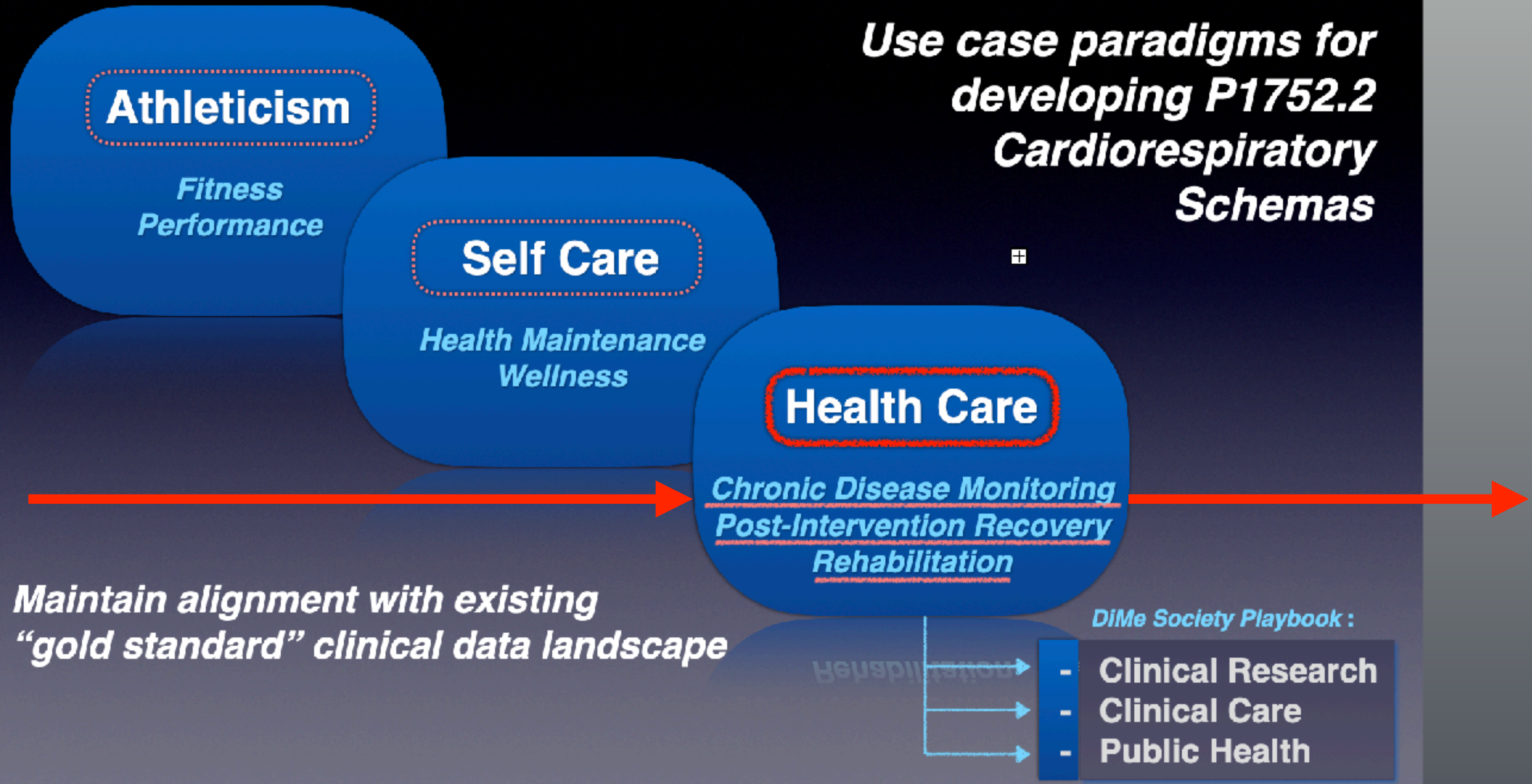


WHO minimum physical activity (PA) guidelines (150 mins/week of moderate-intensity PA) = PAEE of 5 kJ/kg/day
 WHO recommendations for additional health benefits (300 mins/week of moderate-intensity PA) = PAEE of 10 kJ/kg/day

BMJ 2019; 365 doi: <https://doi.org/10.1136/bmj.l2323> (Published 26 June 2019)

Emphasis 2:

Physical Activity Trajectories and Mortality



The metrics used to measure and characterize health also provide for *key context* for measuring and characterizing disease...

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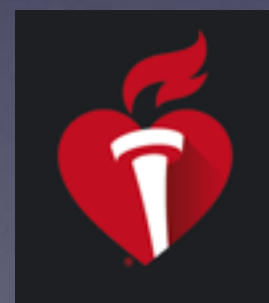
Example:

AHA & PAA : HL7 FHIR

“Physical Activity Implementation Guide”

- Fitness assessment as ‘vital sign’
- P1752.2 schema component metrics

Exercise as a vital sign...



AHA

https://www.cdc.gov/Pcd/issues/2017/17_0030.htm

[https://www.mayoclinicproceedings.org/article/S0025-6196\(19\)31078-X/fulltext](https://www.mayoclinicproceedings.org/article/S0025-6196(19)31078-X/fulltext)

Physical Activity Alliance

'Partners'

			
			
			
			<p>Physical Activity Alliance</p>

Listing of key stakeholders in the “Athleticism” paradigm

Professional organization & industry

Other P1752.2 Open mHealth stakeholder entities

Physical Activity

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Example:

AHA/ACC

“Variety of exercise stress test protocols...”

- Prognostic assesment
- P1752.2 schema component metrics

**Use case paradigms for
developing P1752.2
Cardiorespiratory
Schemas**

Athleticism

*Fitness
Performance*

Self Care

*Health Maintenance
Wellness*

Health Care

*Chronic Disease Monitoring
Post-Intervention Recovery
Rehabilitation*

**Maintain alignment with existing
“gold standard” clinical data landscape**

DiMe Society Playbook :

- Clinical Research
- Clinical Care
- Public Health

Physical Activity Metrics

- *Fitness & performance*
- *Health maintenance & wellness*
- *Chronic disease...*

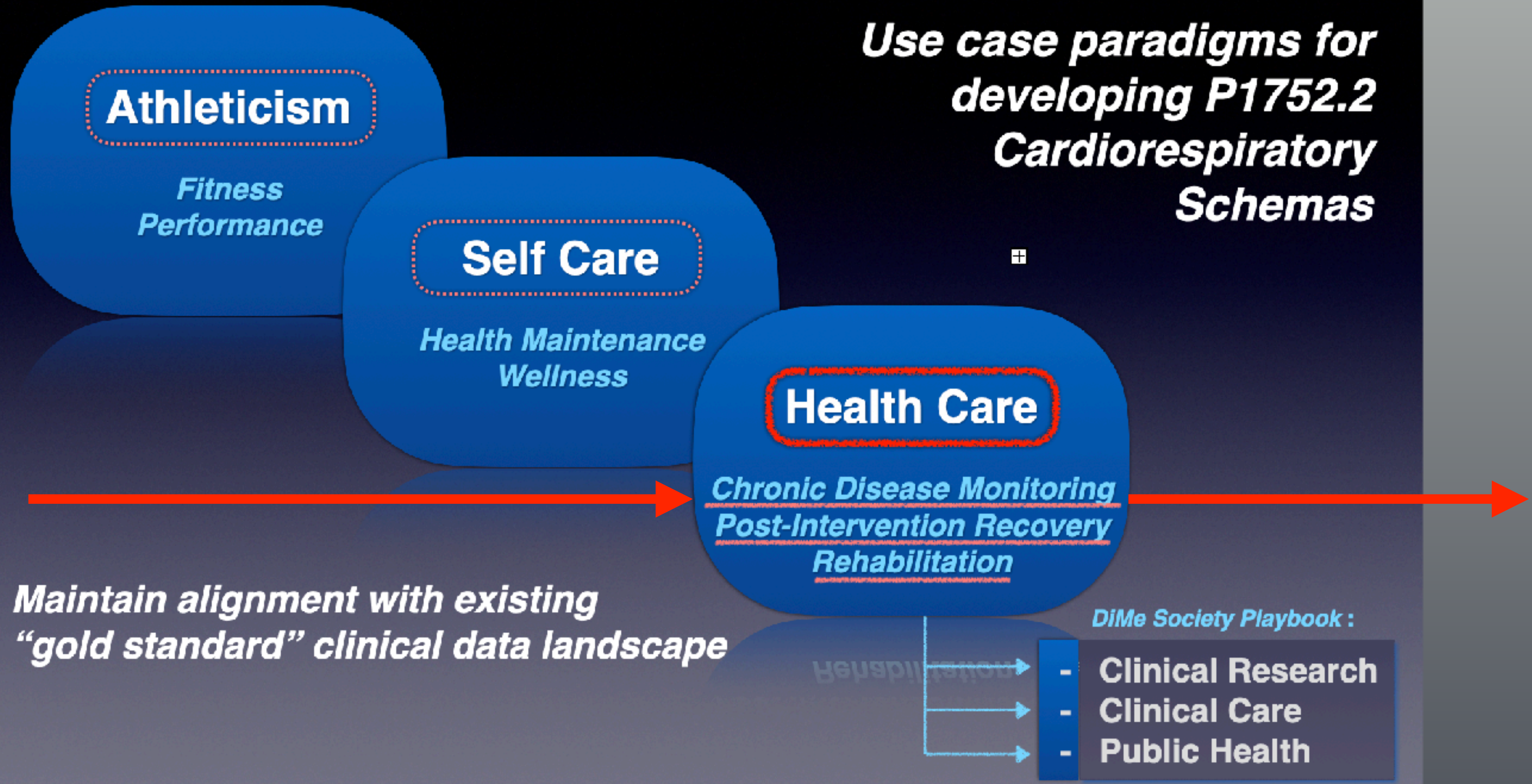
Example:

Impact of cardiomyopathy/ heart failure

(Metric deviations)

Emphasis 2:

Physical Activity Trajectories and Mortality



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Collaborations / Stakeholder Engagement

- *MedTech Industry*
- *Data Industry*
- *Professional Organizations*
- *Advocacy Organizations*

AHA Conference (Nov 5-7, 2022, Chicago, USA)

ACC Scientific sessions (March 2023)

HRS Scientific Sessions (May 2023)

Next meeting :
December 15, 2022 (17:00 UTC)

Changed to 3rd Thursday of the month (*ongoing*)