Overview of Diagnosis in Acute Coronary Syndrome

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Overview

1. Current understanding of diagnostic tools to identify ACS

    - Systems perspective

    - Physician perspective

    - Patient perspective

2. Current biological framework of ACS

3. Does our existing health system adequately capture this framework?

    - Opportunities for future growth
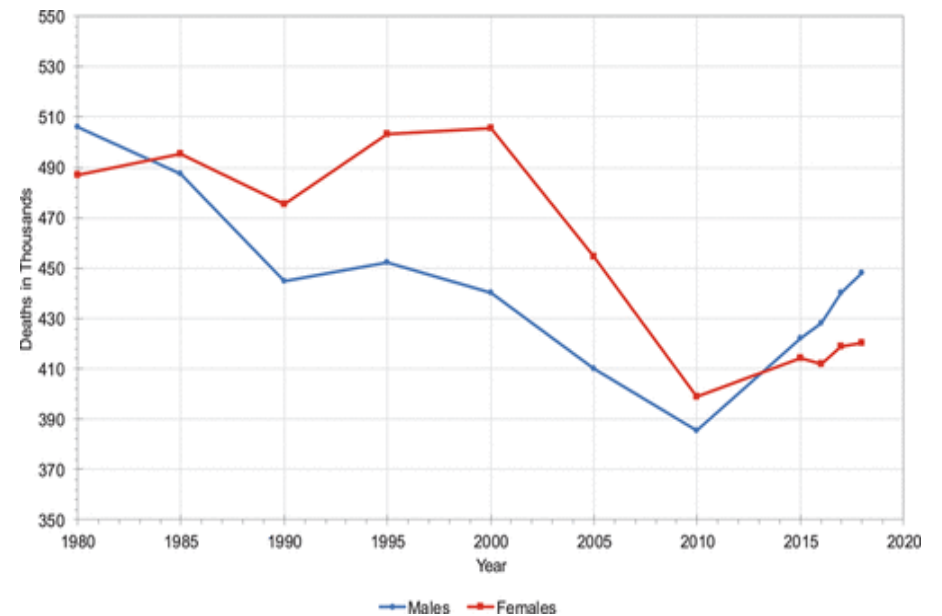
Current landscape of ACS diagnostics

Systems perspective – significant burden of disease

US ED chest pain trends (2006-2014)
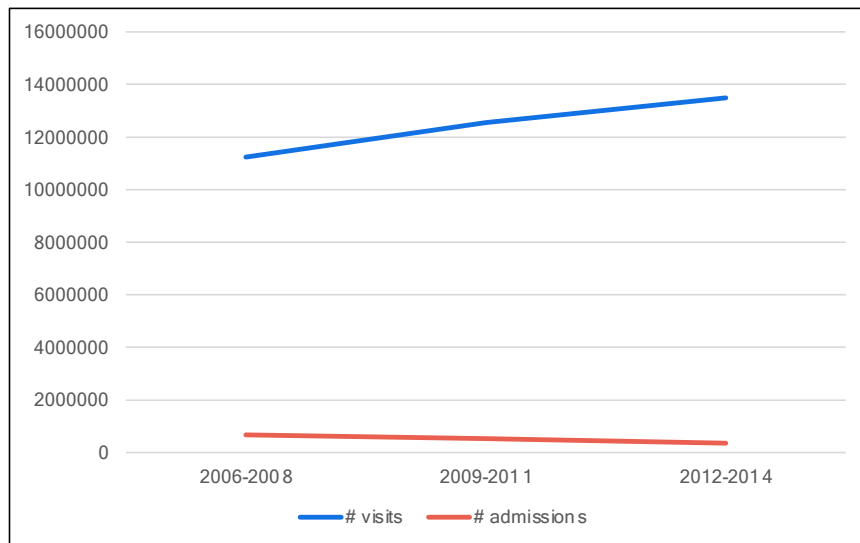
Aalam. 2020

AMI mortality trends in US (1980-2018)

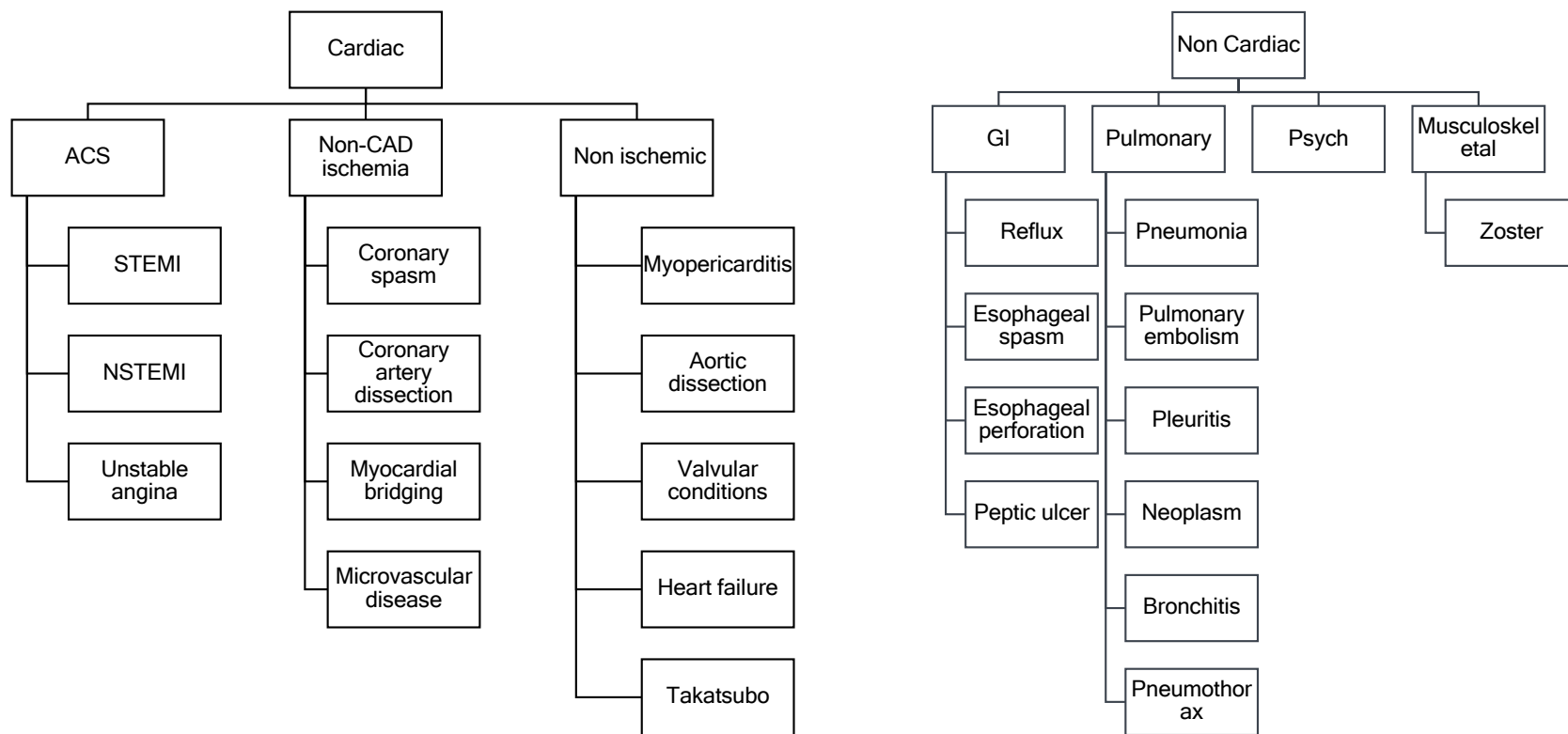*AHA Statistics 2021*

Physician perspective

120 **Million** **visits / year**

6 Million chest pain visits / year
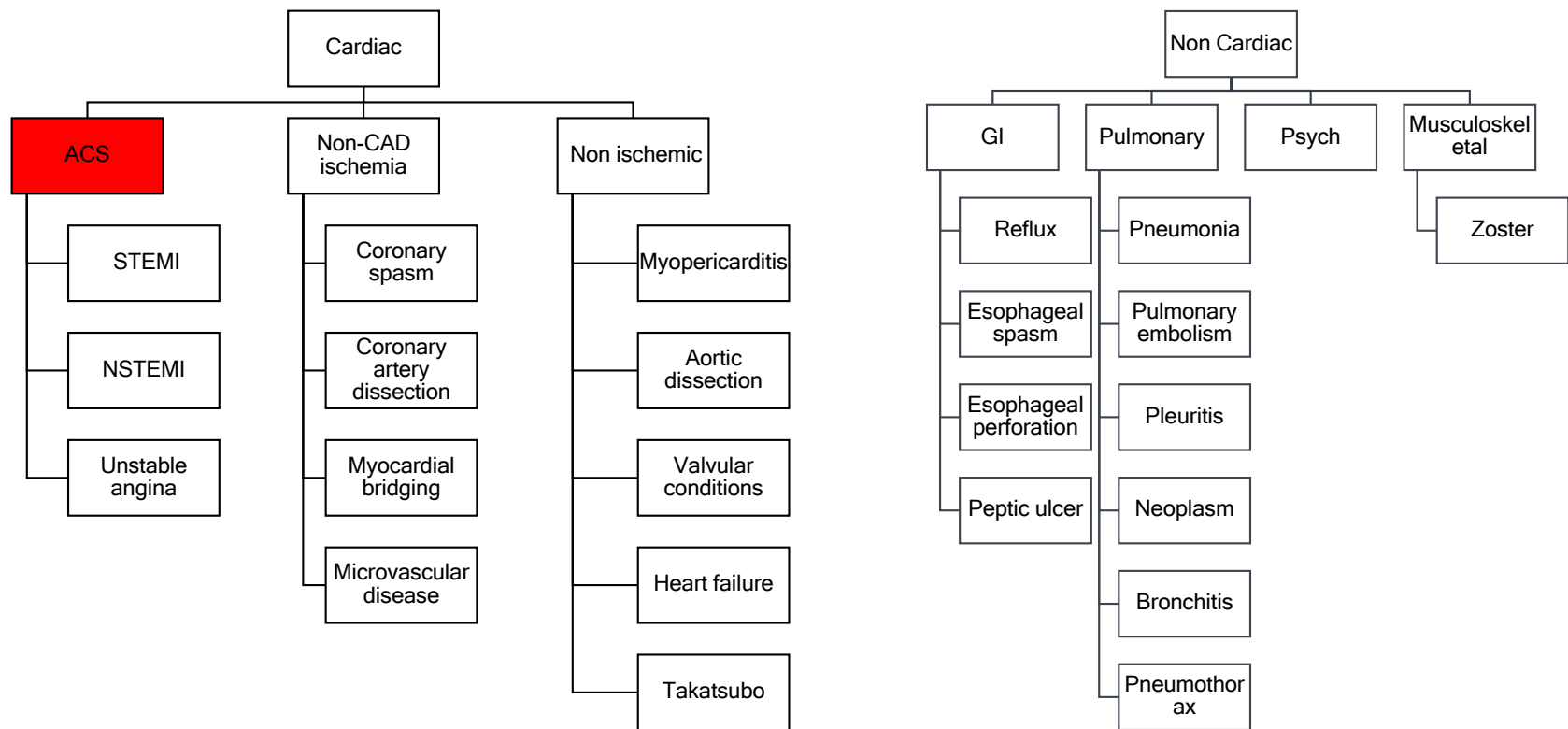
1.04 Million ACS / year

1.02 Million MI / year

23K UA / year

Evaluating a patient with chest pain

Physician perspective – finding the needle in the haystack

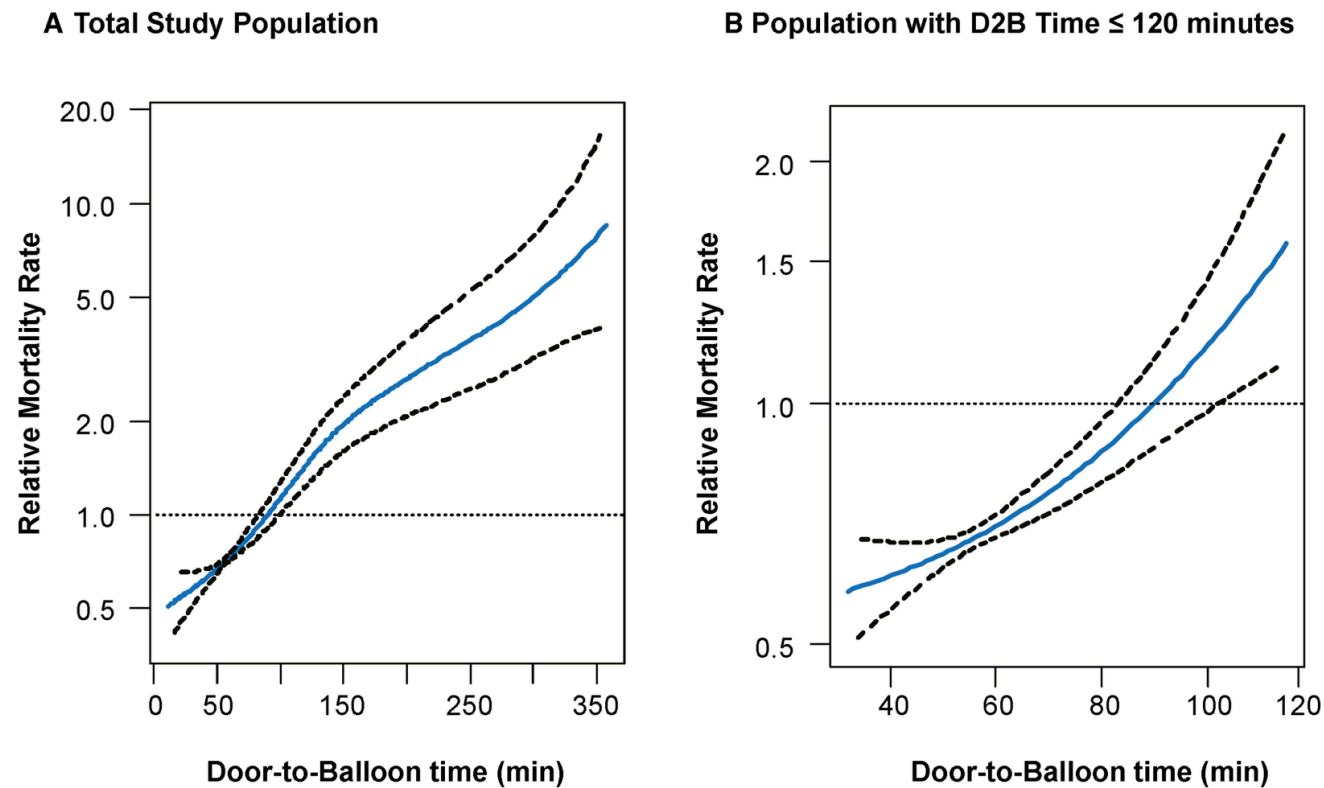# MI presentation

MI presentation

SHORTNESS OF BREATH

NAUSEA

SYNCOPE

DIZZINESS

NO PAIN

Finding a needle in the haystack

Yale SCHOOL OF MEDICINE

Patient perspective – improved survival and outcomes

A Total Study Population

B Population with D2B Time ≤ 120 minutes

Park 2019

Diagnostic tools available to identify ACS

History and risk stratification tools

ECG

Biomarkers

Diagnostic imaging

Historical perspective

History → CPU

CK/MB → Troponin

Sensitive troponin → High-sensitivity Troponin

Imaging advances

Angiography

ETT   Stress echo   MRI

Sestamibi   Coronary CTA   PET
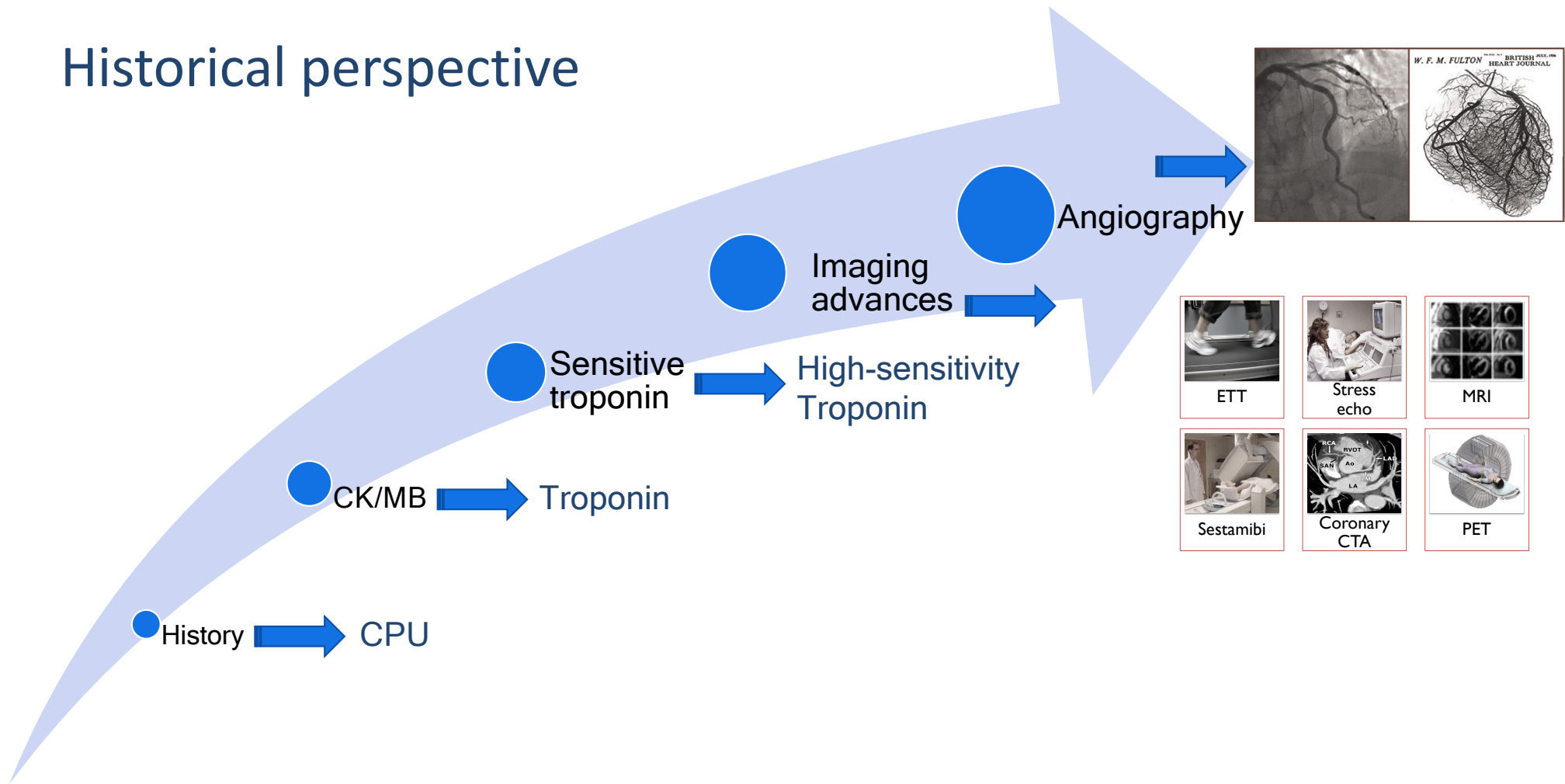
Biological framework

Mechanisms
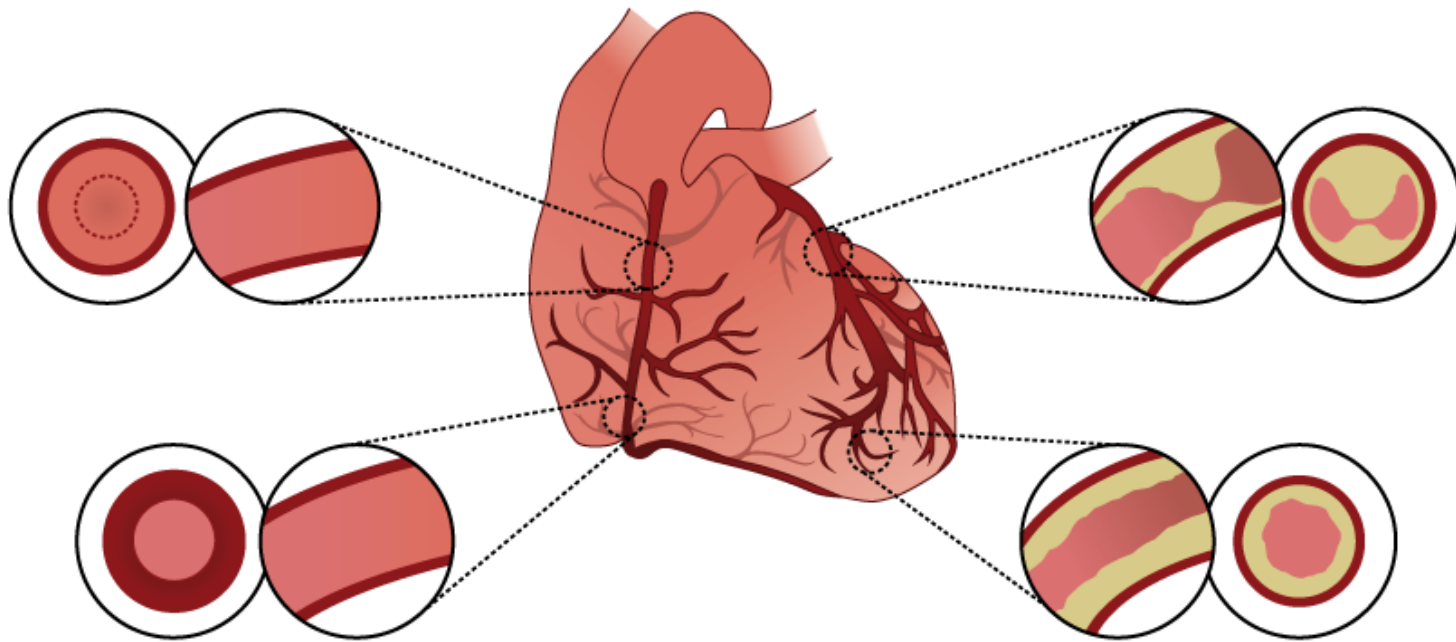
Safdar B. Yale J Bio Med. 2016

How well does it fit?

Not quite right

✅ MI from CAD

⚠️ MI from non-CAD (MINOCA)

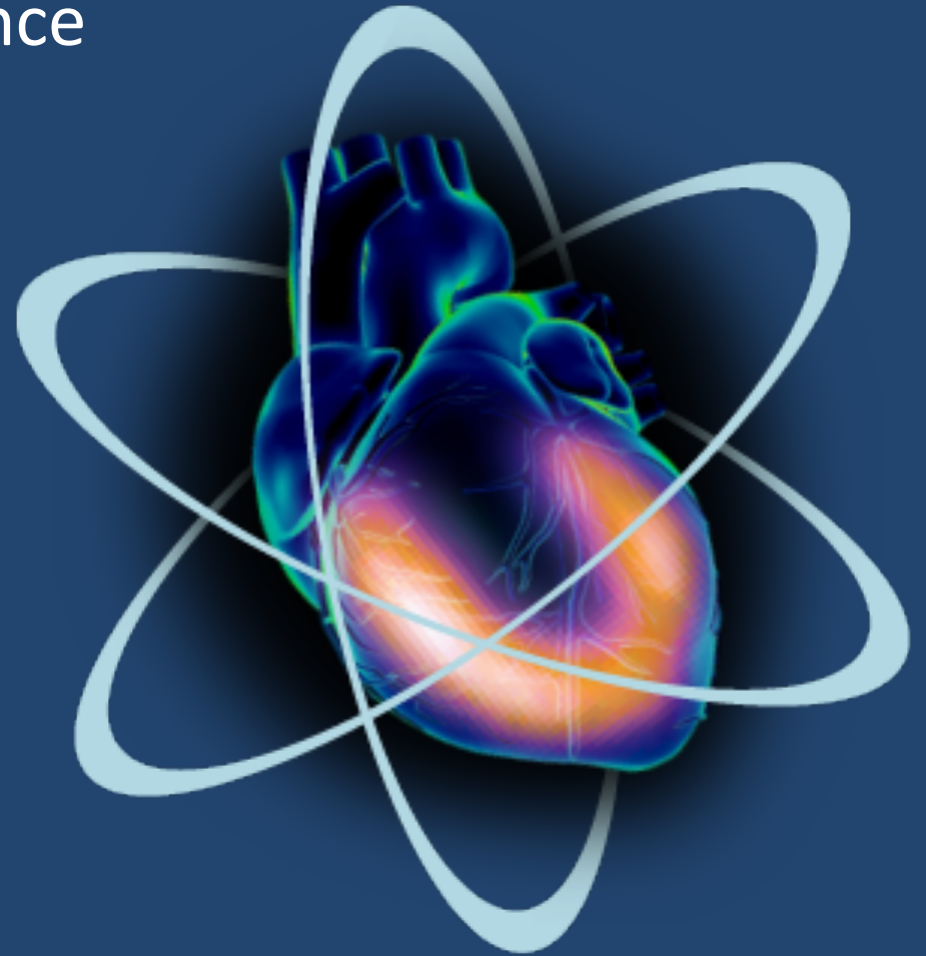⚠️ ACS from other causes such as CMD or vasospasm

Challenges in diagnostic excellence

Cognitive biases of 'classic' MI

"False positive" diagnostics

"troponinemia" or "troponinitis"

Chest pain not otherwise specified (NOS)

Summary

Current approach to ACS works well for obstructive CAD but gaps exist for non-classic presentations.

Focusing on 'CAD only' leads to repeat testing with cost to patients (radiation, time, adverse effects) and system ($$$$, resources)

Gaps exist in managing 'noise' in our current diagnostics as sensitivity has increased without providing patients with a definitive diagnosis
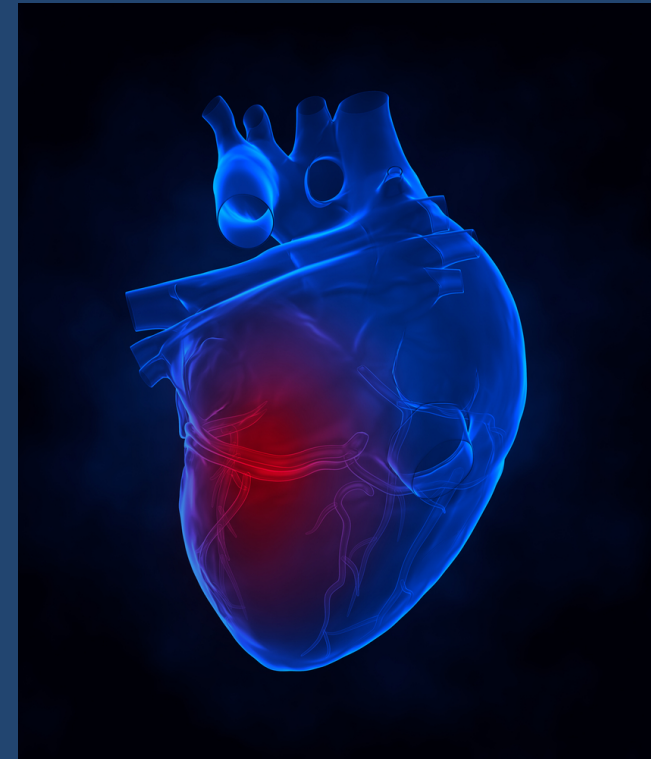
Recommendations

Diagnostic excellence in ACS must incorporate the evolving science of ACS pathophysiology as well as sex/gender/racial nuances.

Leverage the advances in technology by adapting existing protocols to new information – e.g. utilizing CFR, FFR or calcium score when available.

Future research should investigate all forms of cardiac ischemia and its influence on patient experience, outcomes, precision, costs, and errors.

Questions

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