
Comprehensive physiologic assessment using intracoronary pressure and flow

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Disclosures

Speaker's name: Javier Escaned

I have the following potential conflicts of interest to report in the field of this presentation:

Speaker at educational events and consultancies: ABBOTT,
BOSTON SCIENTIFIC, PHILIPS-VOLCANO

Epicardial vessels and microcirculation



Main function:

Conductance

Tests :

-FFR, iFR



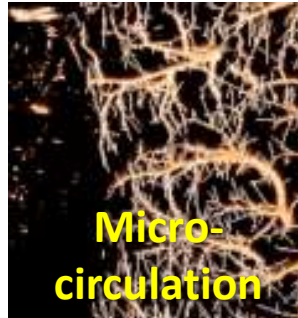
Main function:

Regulation blood supply (+ conductance)

Tests:

-CFR (endothelial- and non-endothelial dependent)
-Minimal resistance

Epicardial vessels and microcirculation



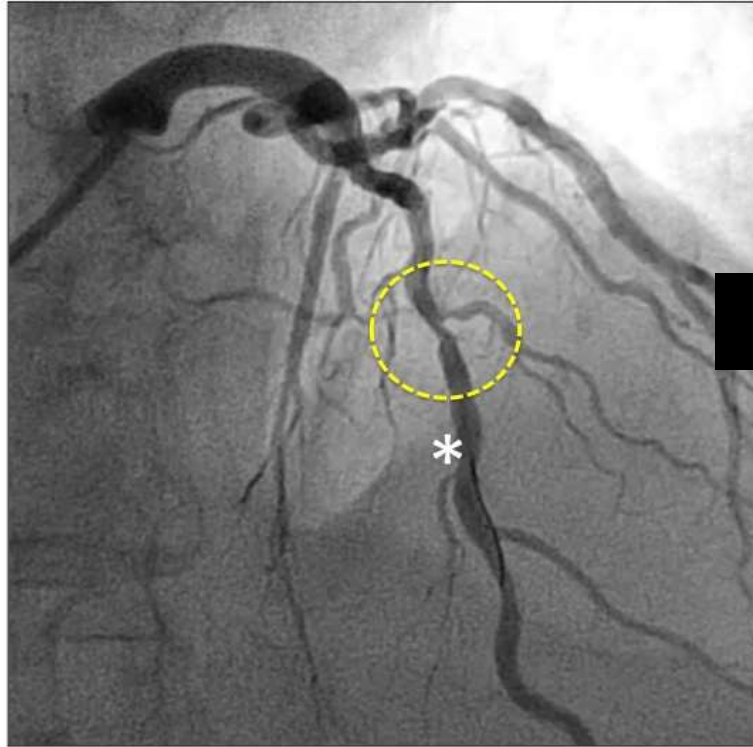
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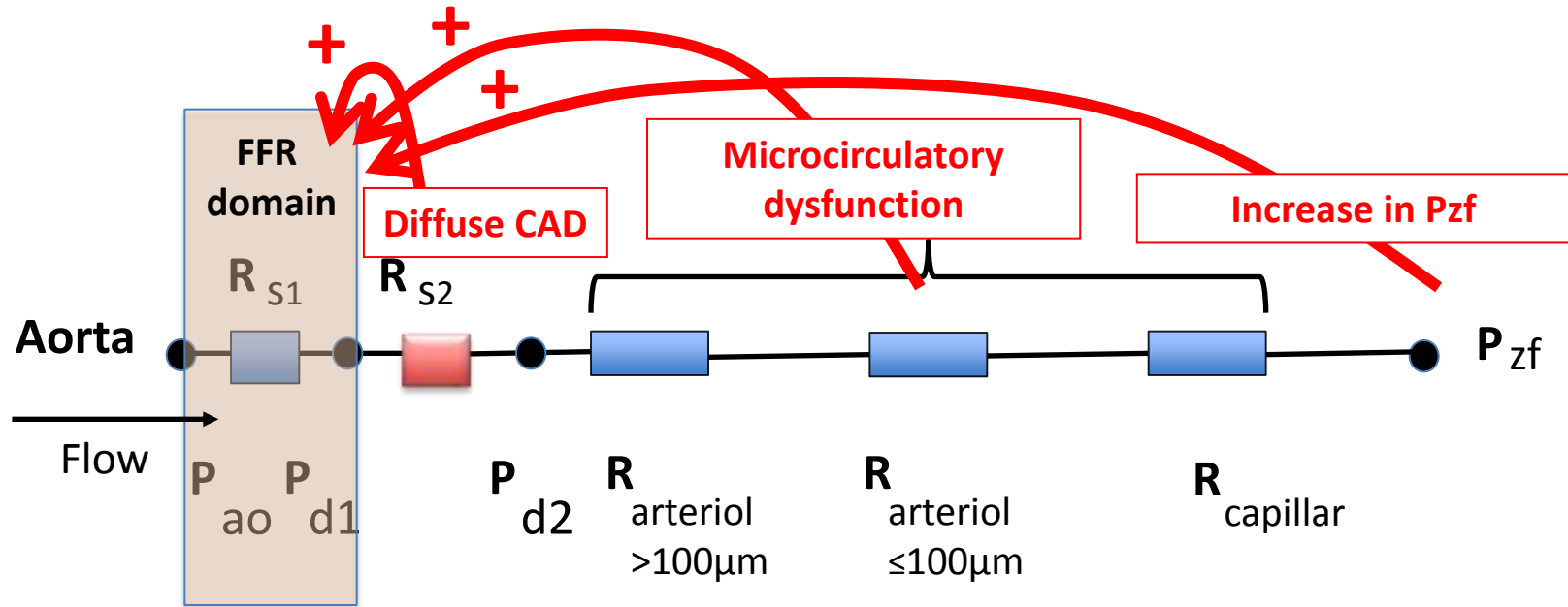
Tests:
-CFR (endothelial- and non-endothelial dependent)
-Minimal resistance

A frequent clinical scenario in the FFR era: $\text{FFR} > 0.80$

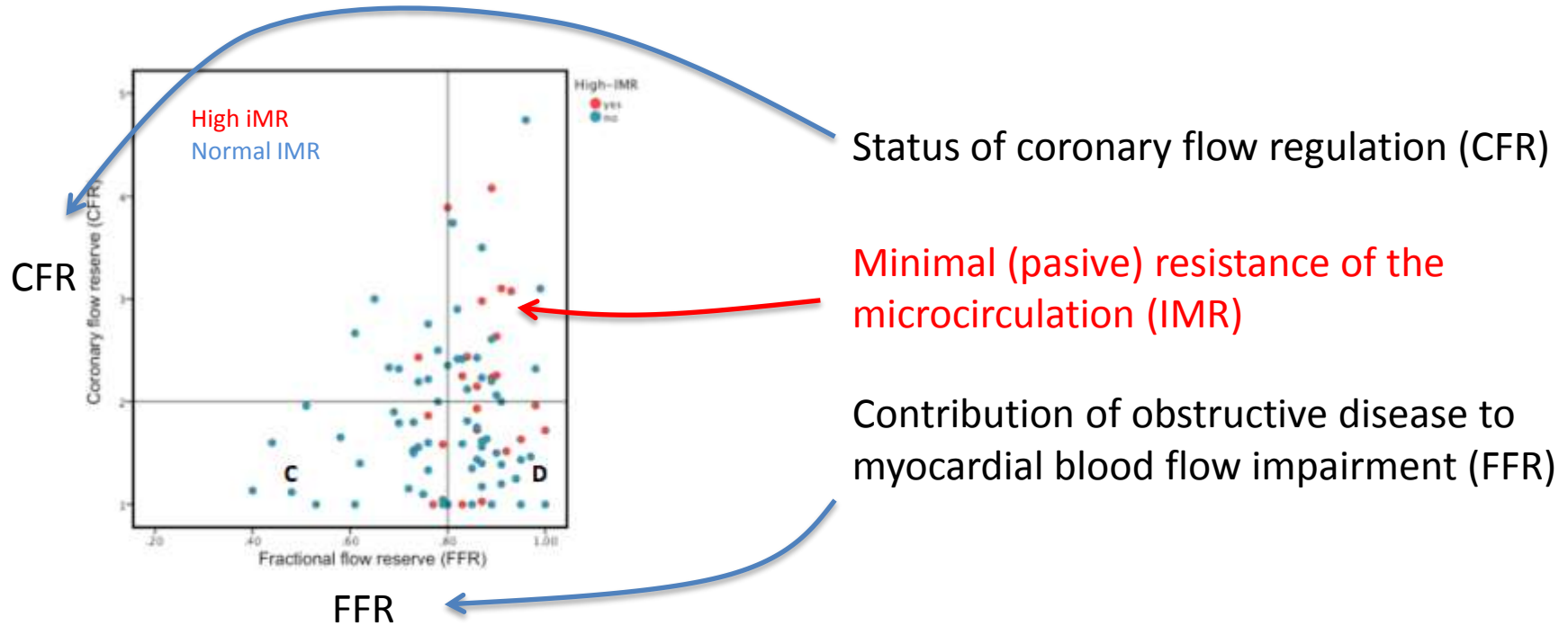


FFR 0.93

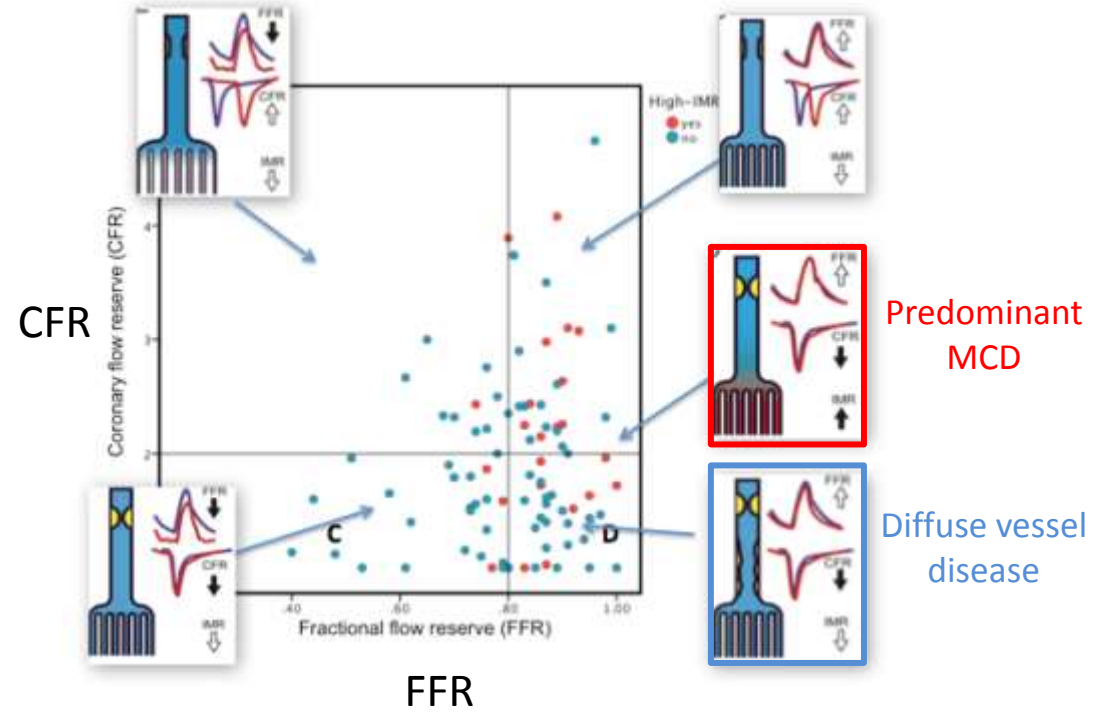
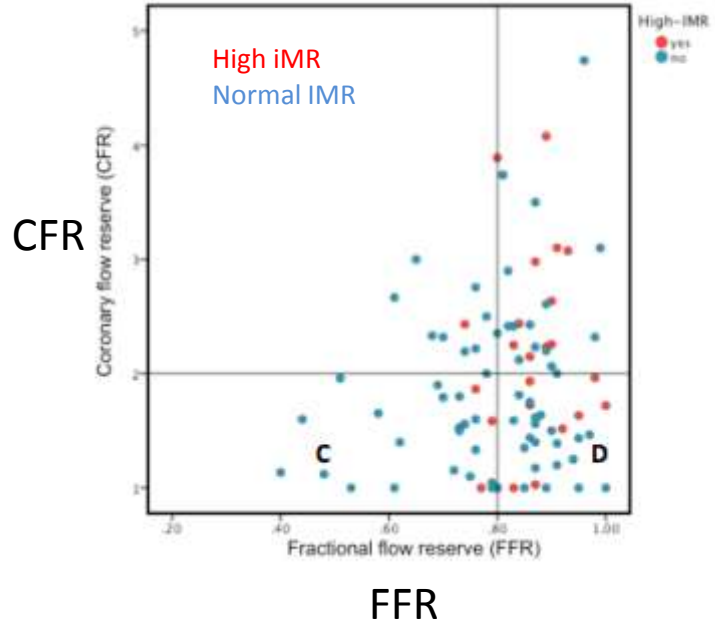
A frequent clinical scenario in the FFR era: $FFR > 0.80$



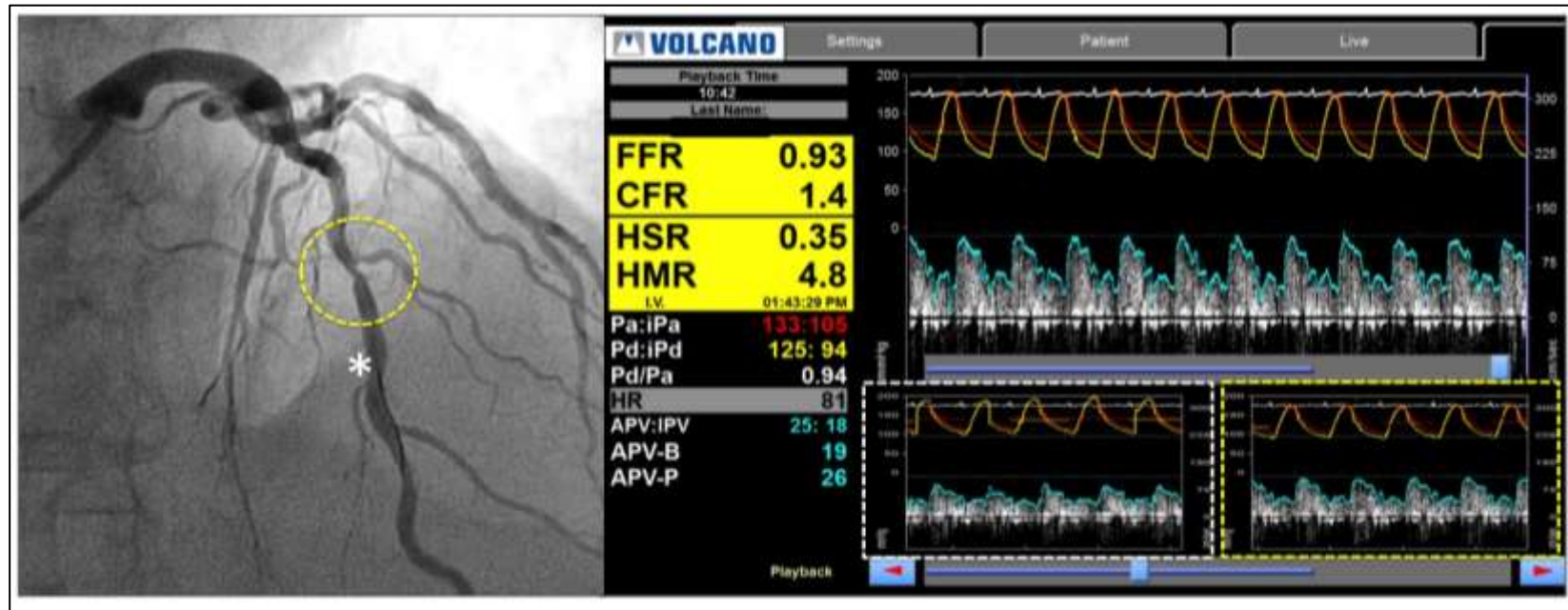
Value of conceptual maps using FFR and CFR



Value of conceptual maps using FFR and CFR

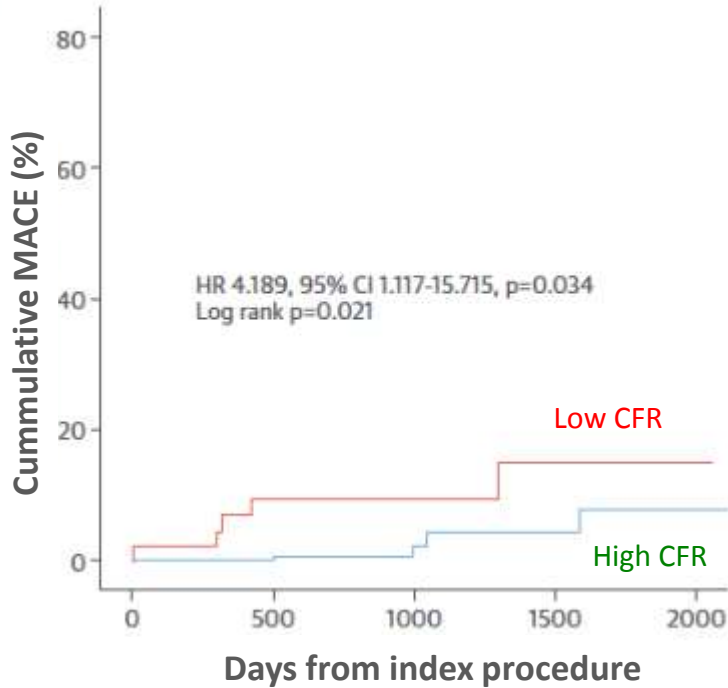


Outlining the involvement of epicardial and microcirculatory domains in ischaemic heart disease

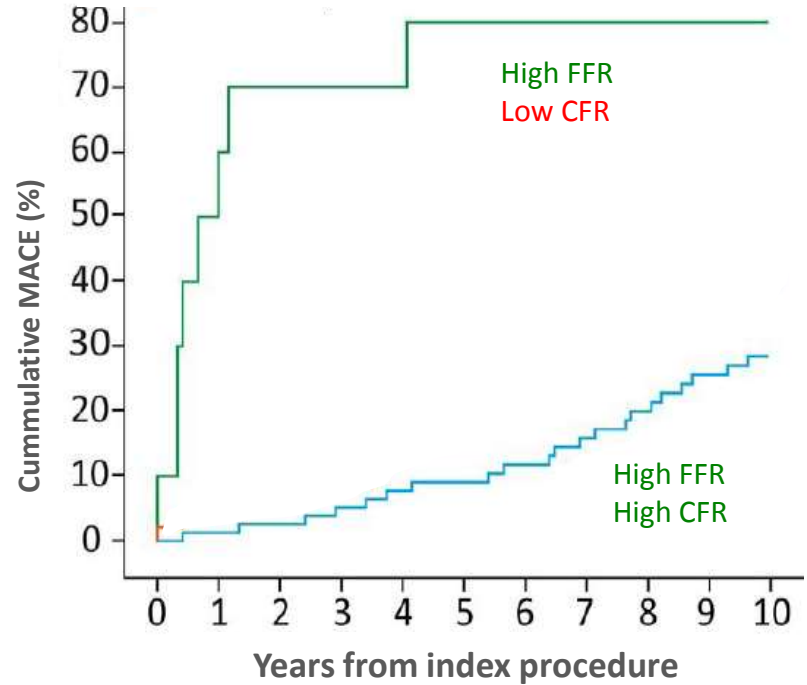


Normal FFR / Decreased CFR / Increased HMR (microcirculatory resistance)

Prognostic implications of FFR >0.80 and abnormal CFR

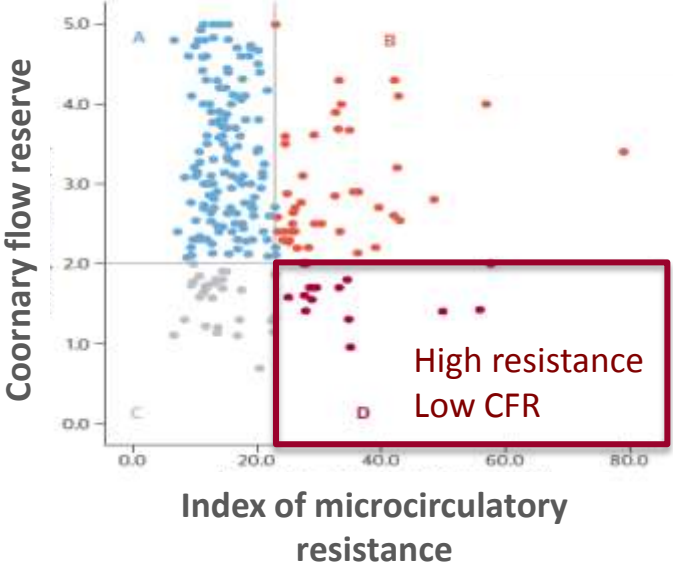


Lee MG, Koo BK et al JACC 2016;67:1158-69.

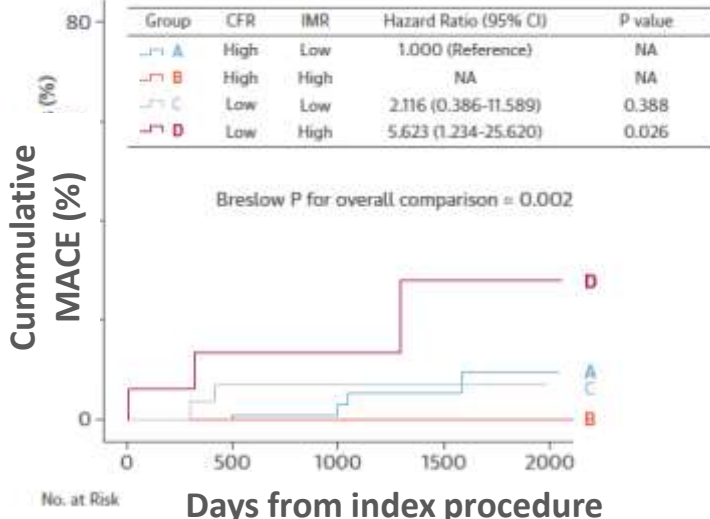


Van de Hoef T et al Circulation Cardiovasc Interv 2014

CFR and microcirculatory resistance in FFR>0.80



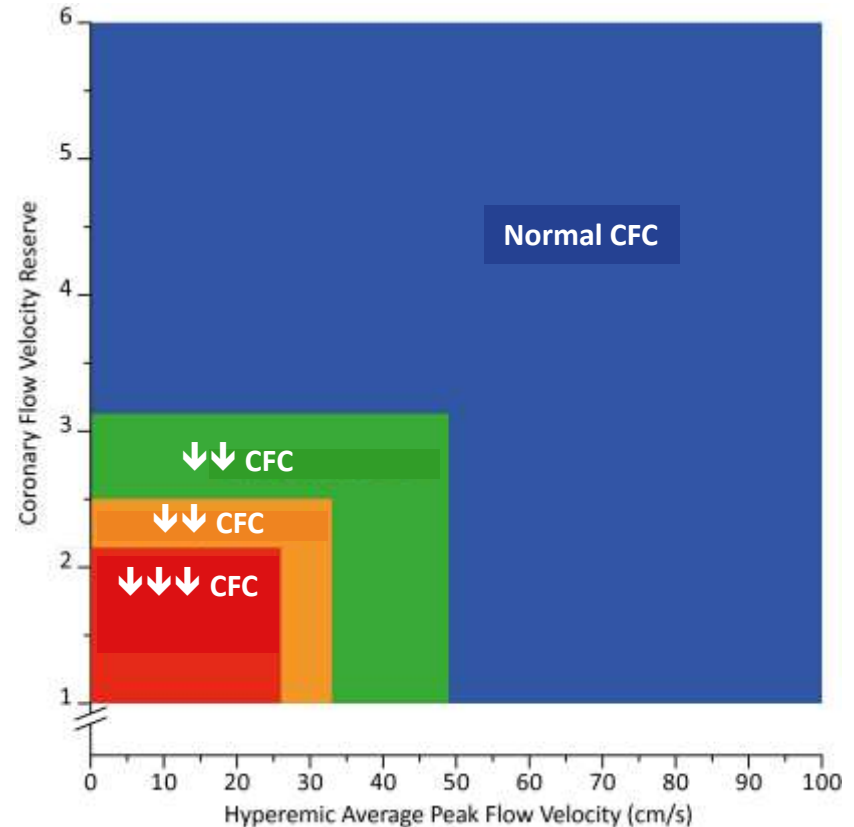
Overall study population
Stratified by CFR and IMR



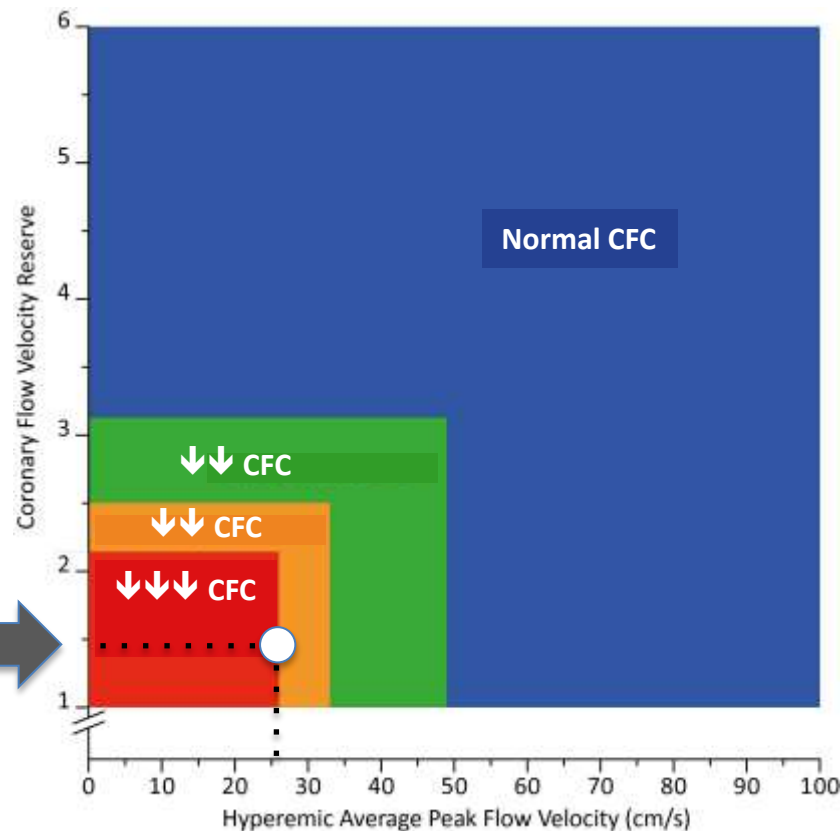
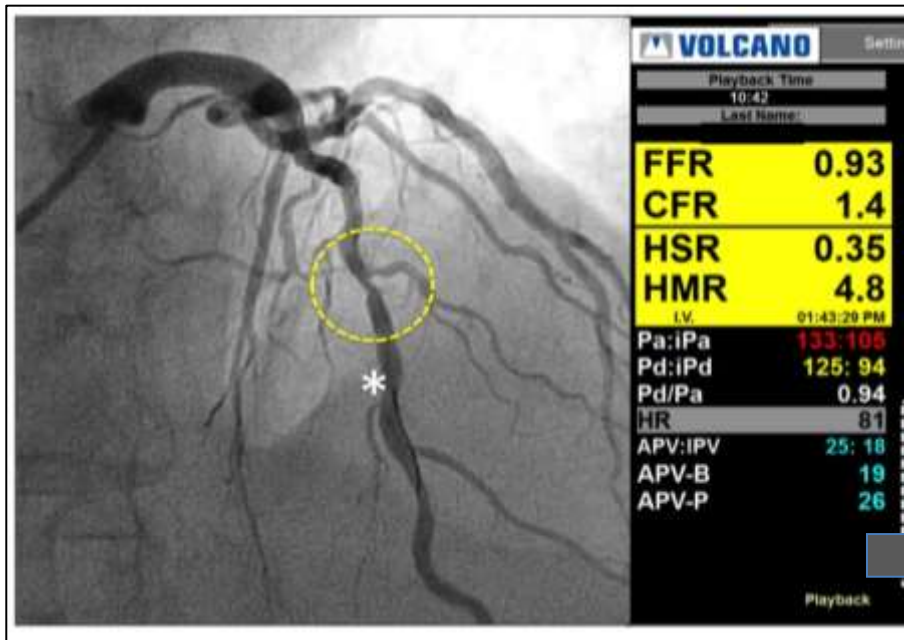
Coronary Flow Capacity: a conceptual map to circumvent limitations of CFR

The coronary flow capacity concept utilizes the complementarity of **CFR** and **hyperemic flow** to improve the potential of a flow-based diagnostic approach.

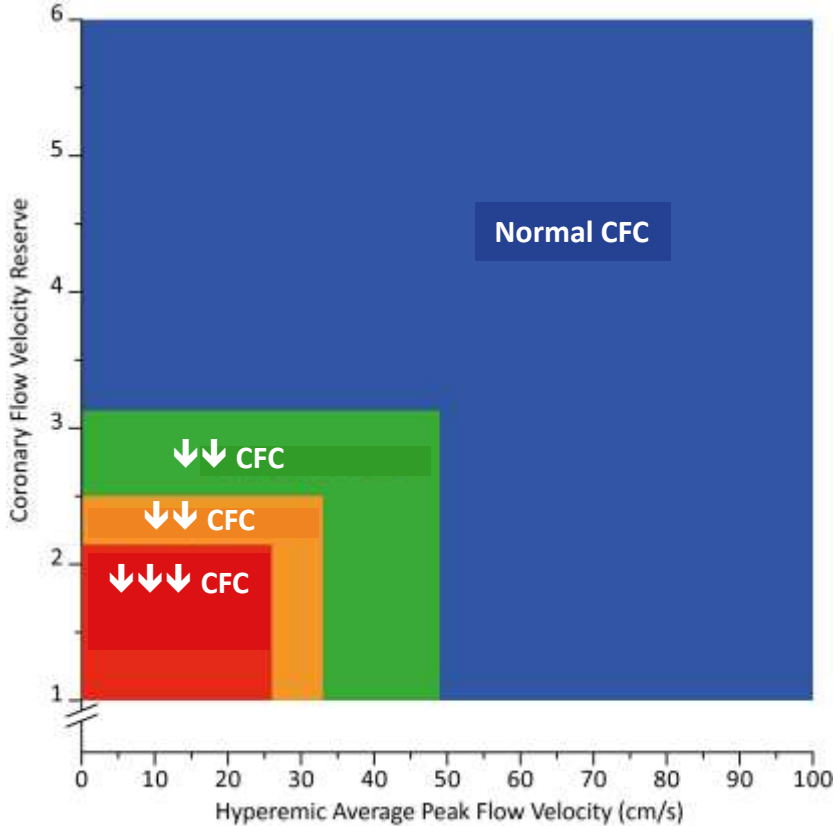
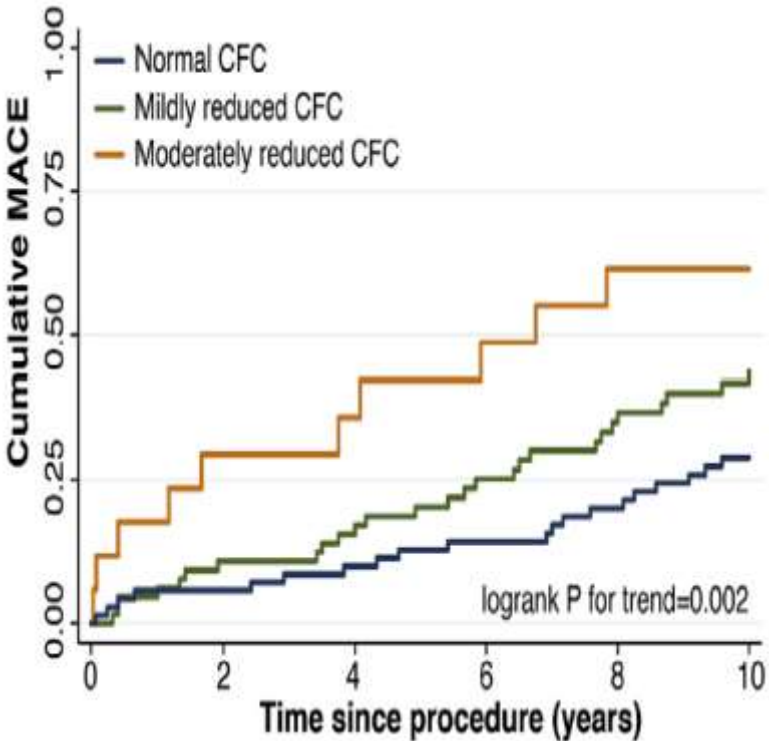
CFC translates into meaningful incremental MACE risk stratification in IHD by allowing a comprehensive assessment of myocardial flow impairment.



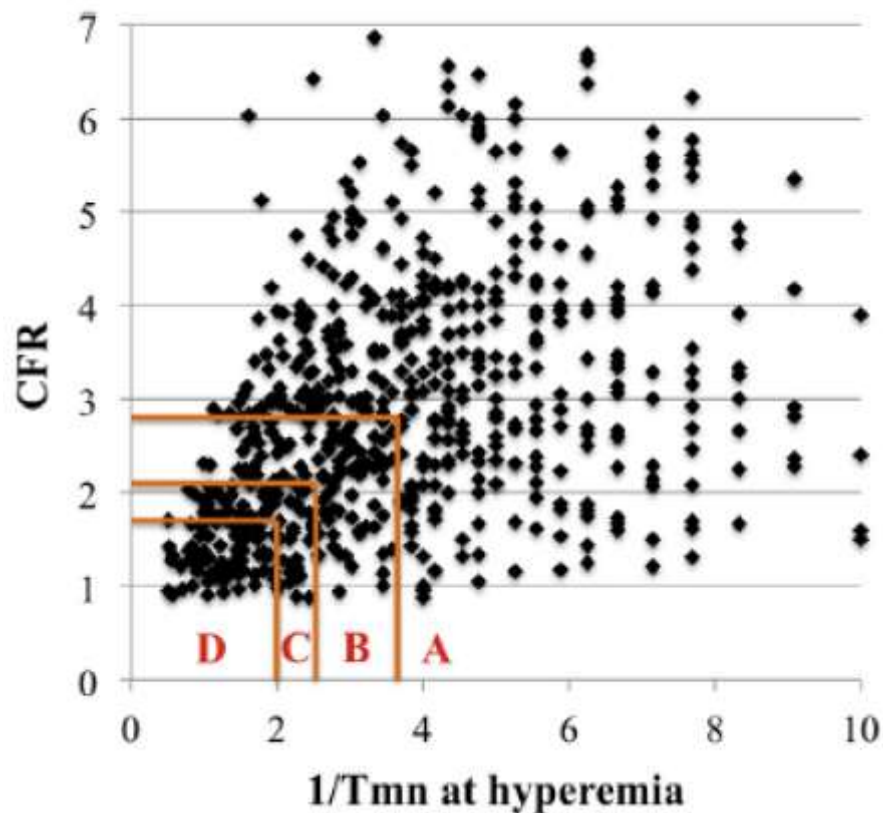
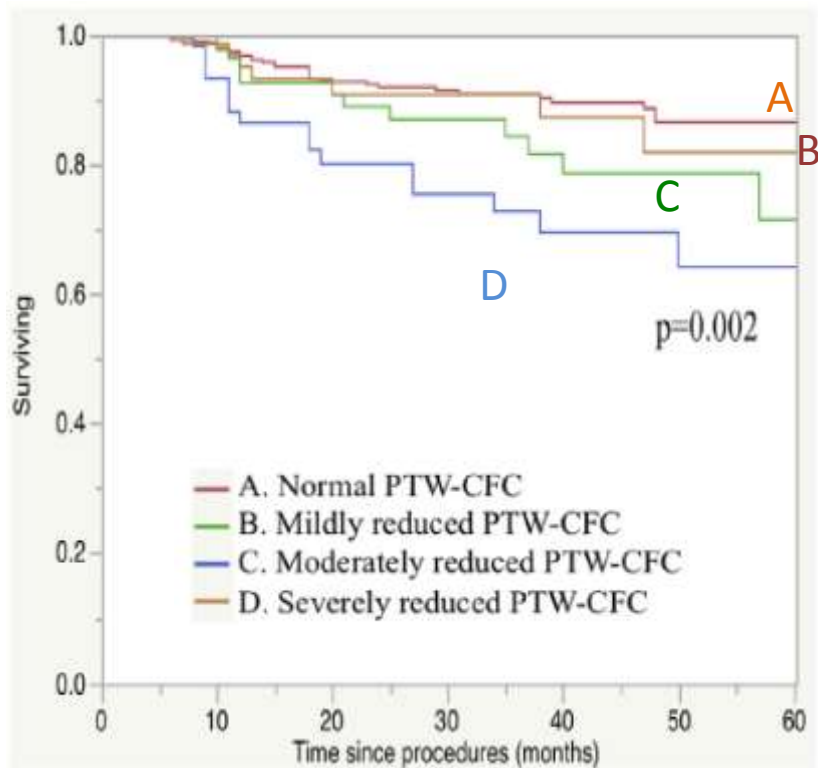
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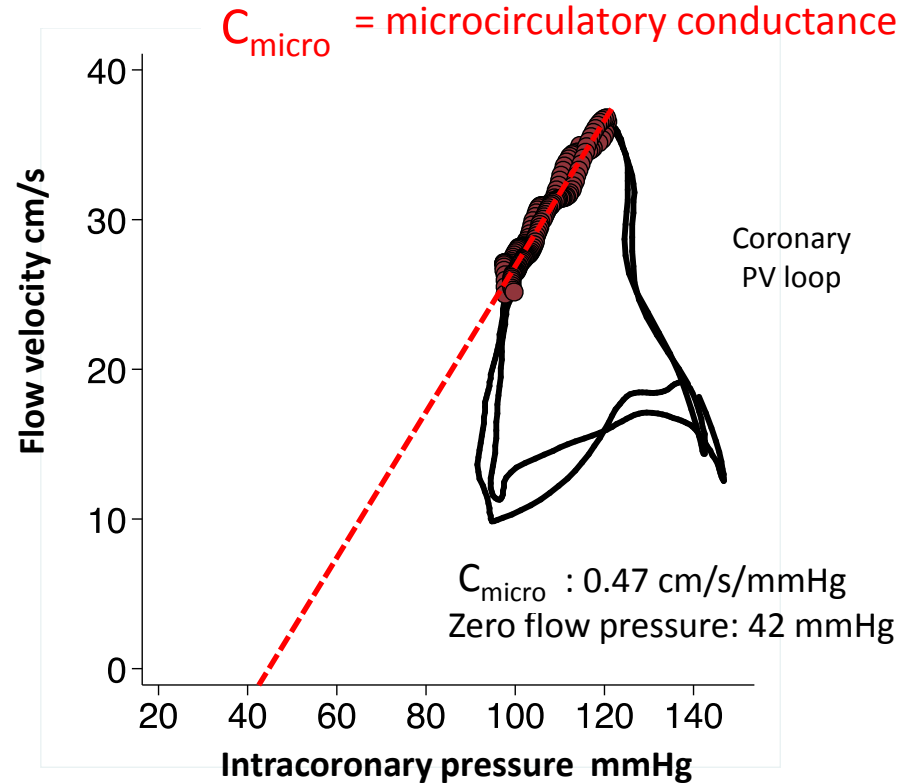
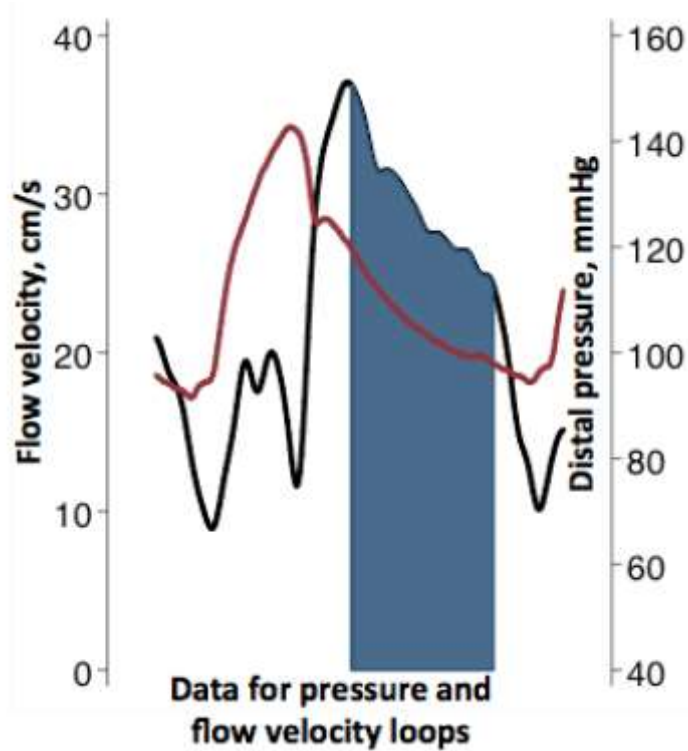
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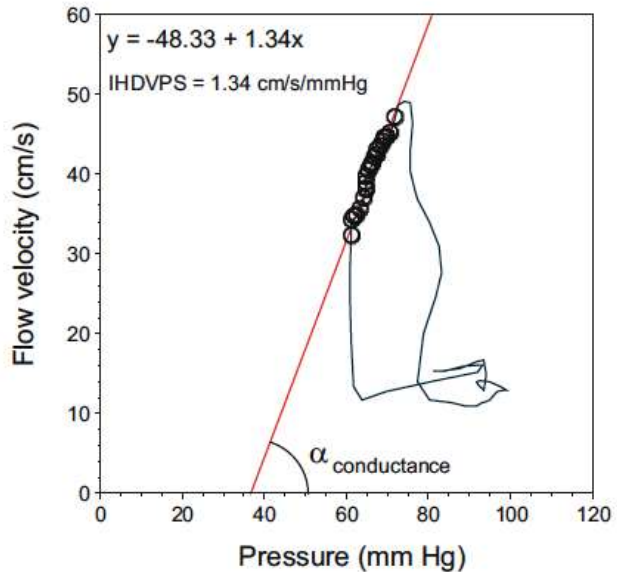
Coronary Flow Capacity estimated with intracoronary thermodilution



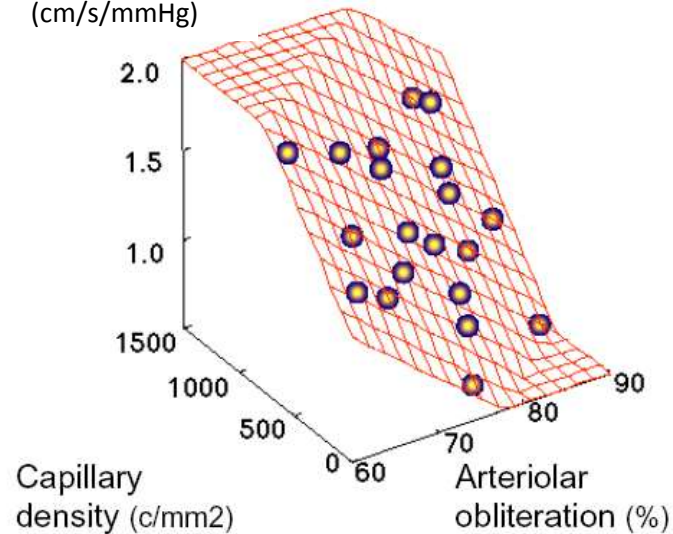
Pressure-flow relationships in mid-late diastole



Microcirculatory conductance (C_{micro}) and structural remodelling of arterioles and capillaries

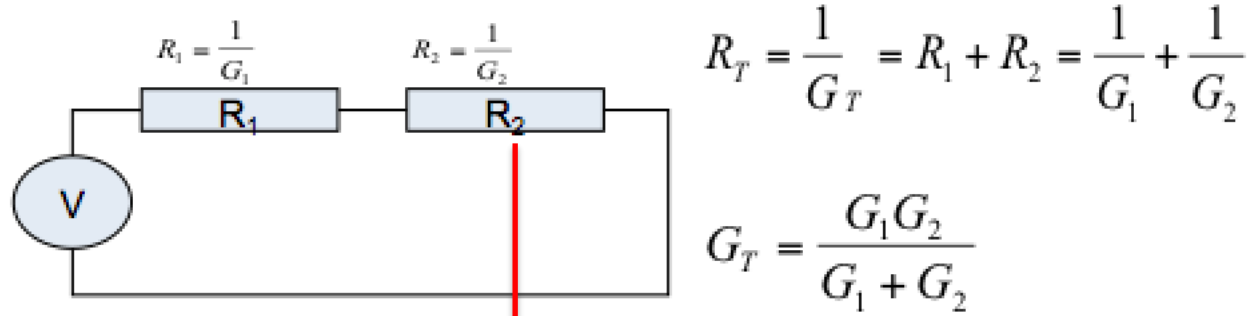


Microcirculatory
Conductance
(cm/s/mmHg)

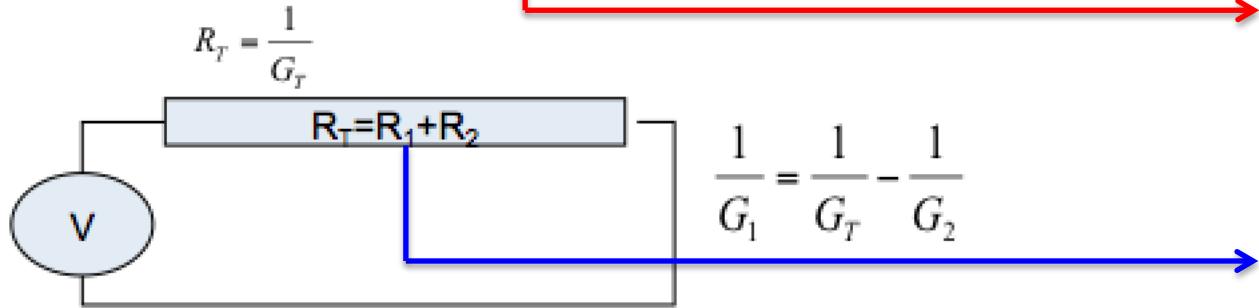


Validation of invasive measurements against endomyocardial biopsies demonstrated that myocardial capillary rarefaction is an independent contributor to disturbed microcirculatory hemodynamics.

Derivation of epicardial conductance (Cepi)

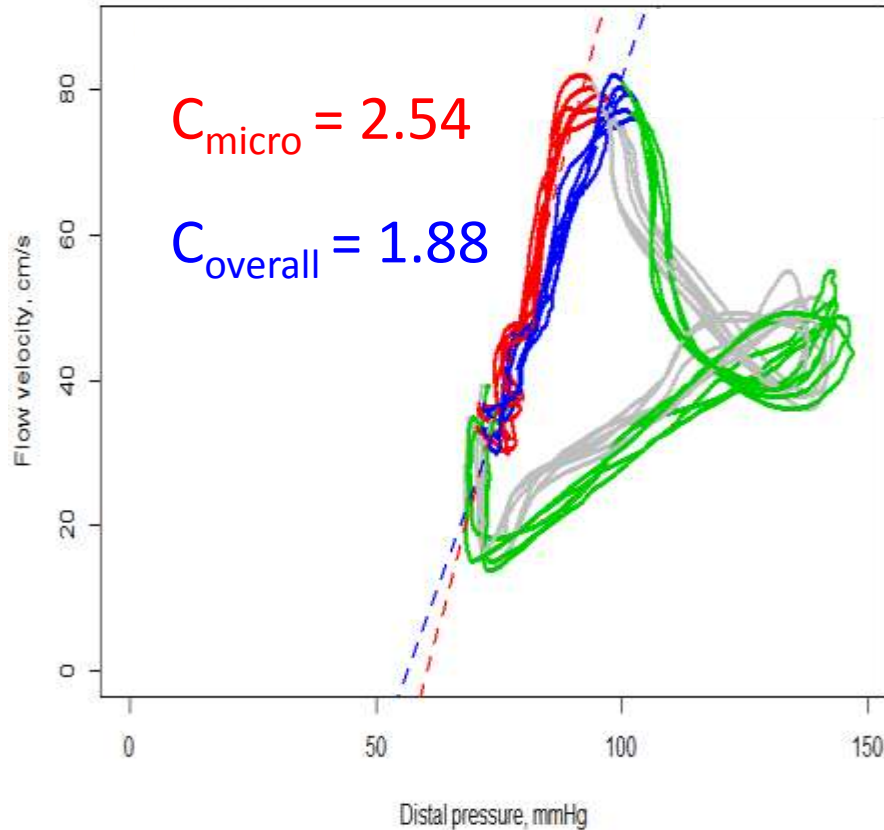


Microcirculatory
resistance calculated
from **Pd** and flow



Overall resistance
calculated from **Pa** and flow

Derivation of C_{epi} from pressure-velocity loops

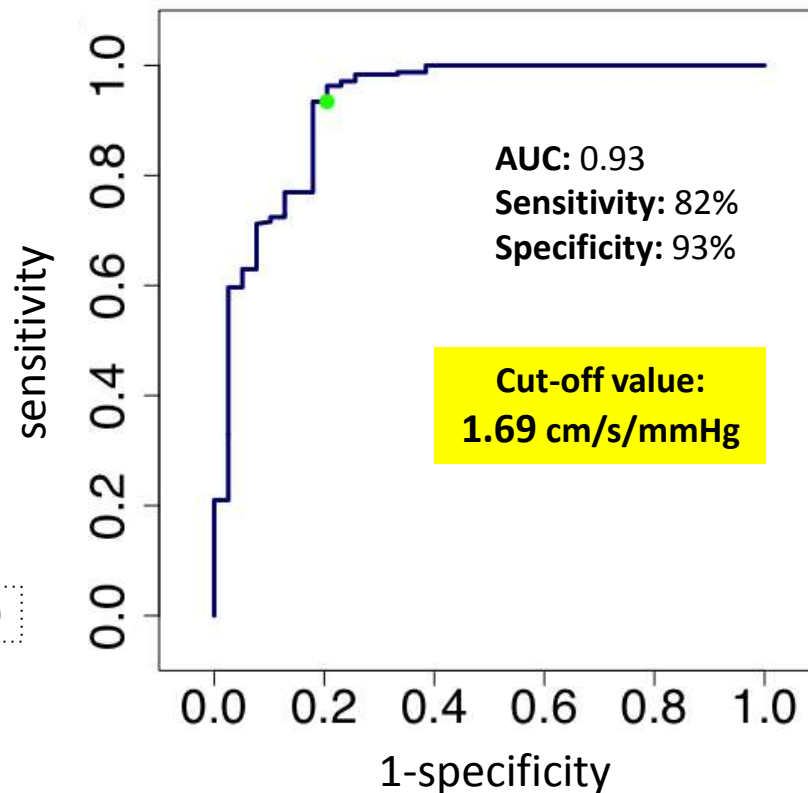
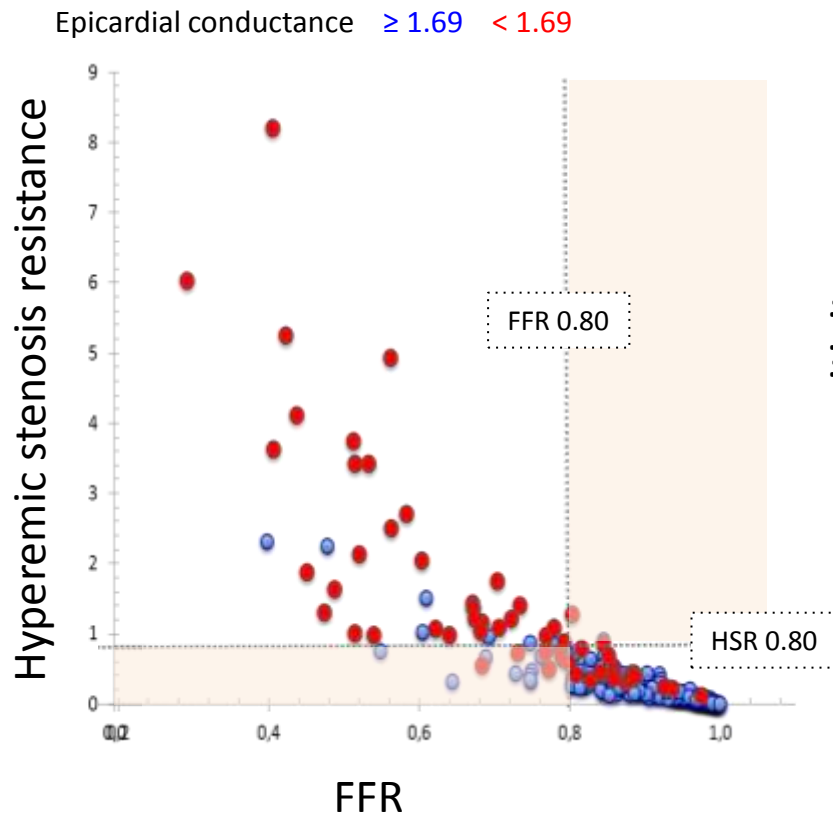


Estimation of C_{epi} is based in pressure-Doppler velocity loops generated with Pd (C_{micro}) and Pa ($C_{overall}$)

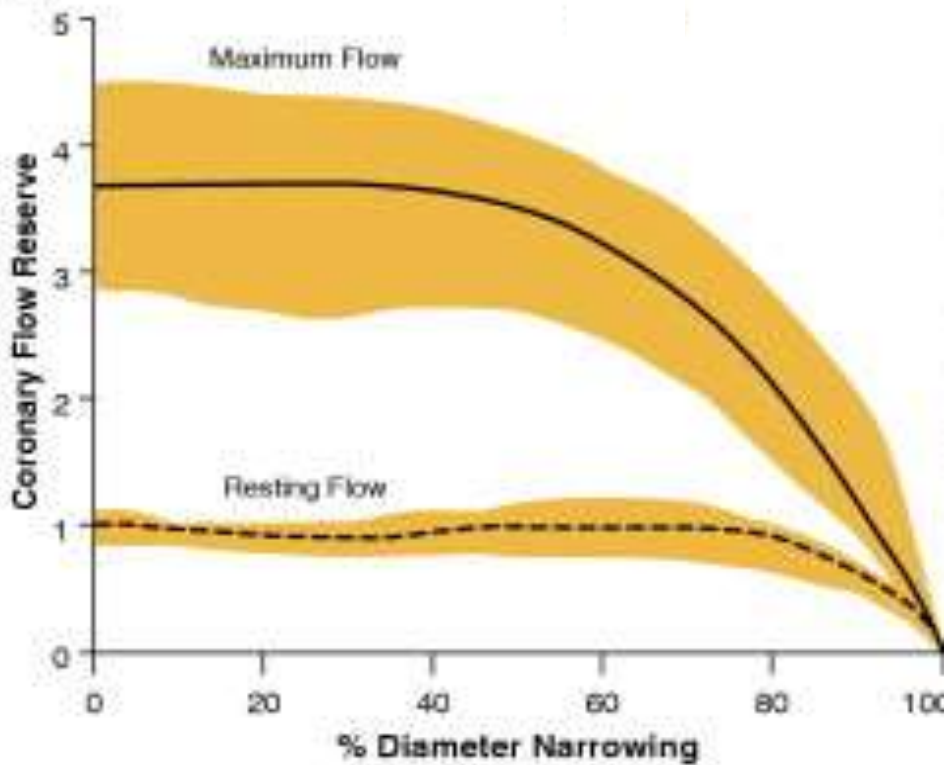
$$C_{epi} = \frac{C_{micro} * C_{overall}}{C_{micro} - C_{overall}} = 7.26$$

Conductance units: cm/s/mmHg

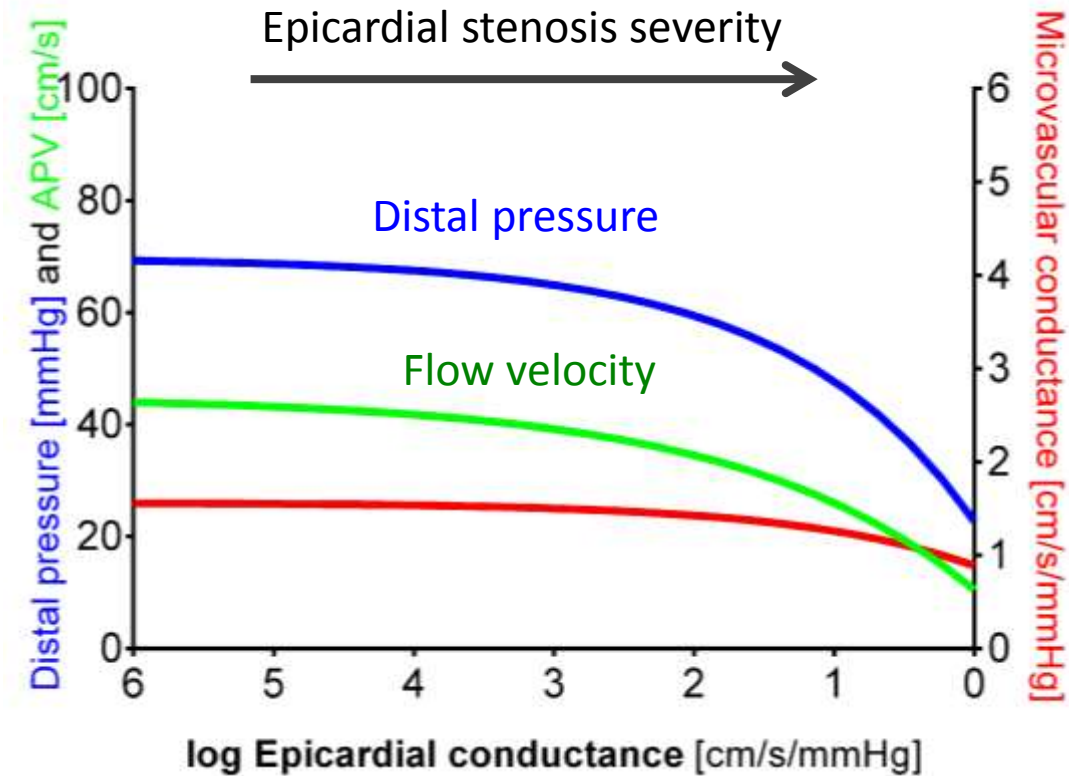
Validation of Capi against combined FFR and HSR



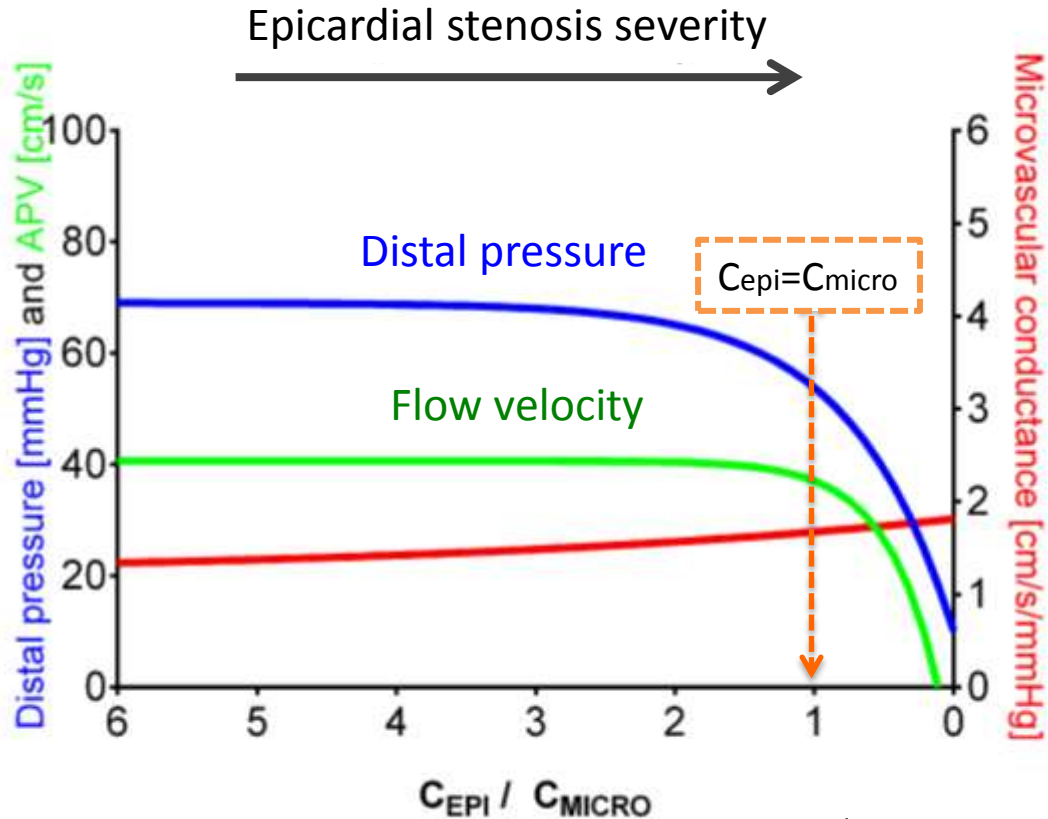
Revisiting coronary physiology with C_{epi} and C_{micro}



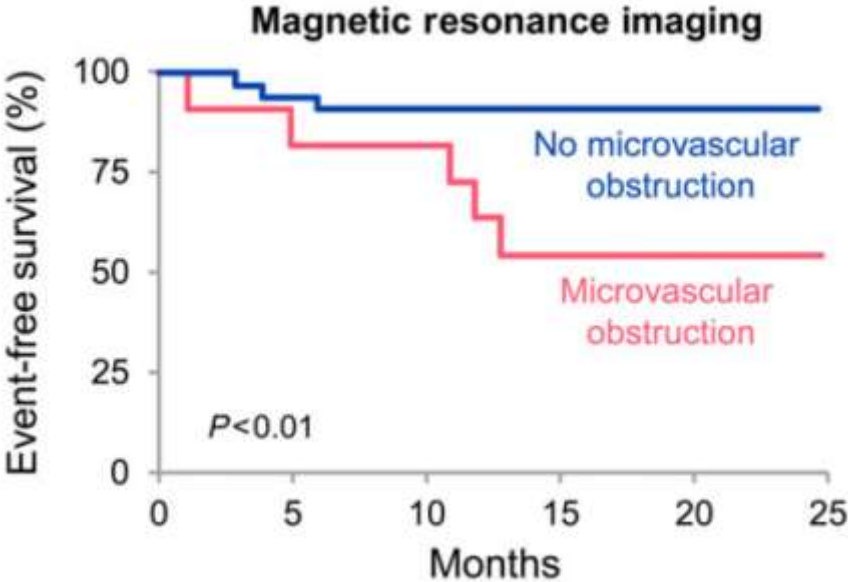
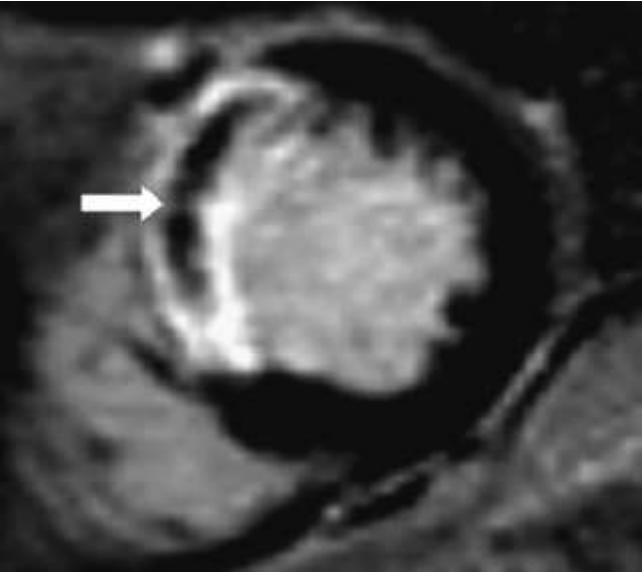
Revisiting coronary physiology with Cepi and Cmicro



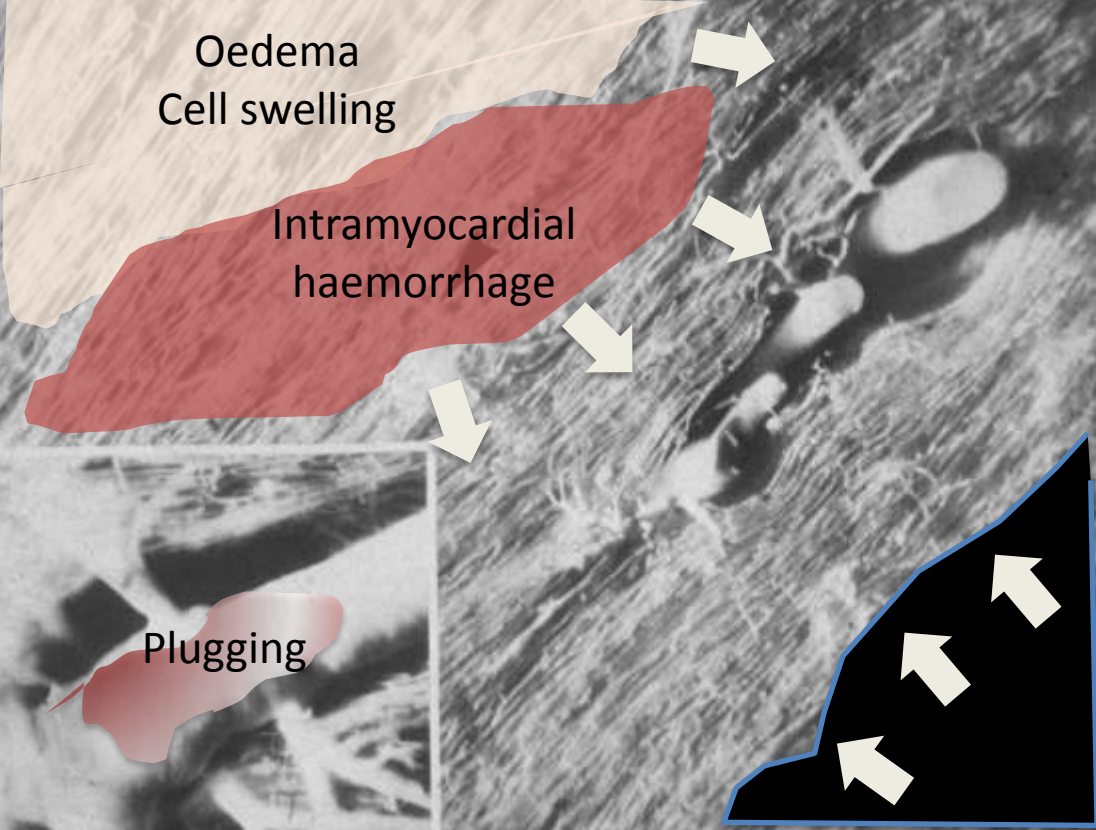
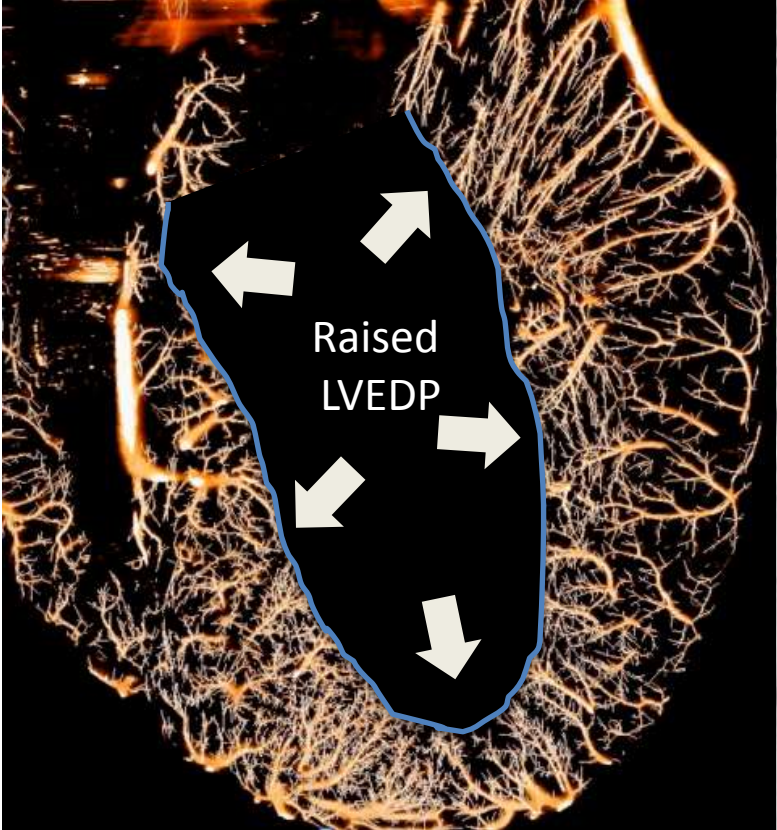
Revisiting coronary physiology with C_{epi} and C_{micro}



PV loops and assessment of microcirculation in STEMI



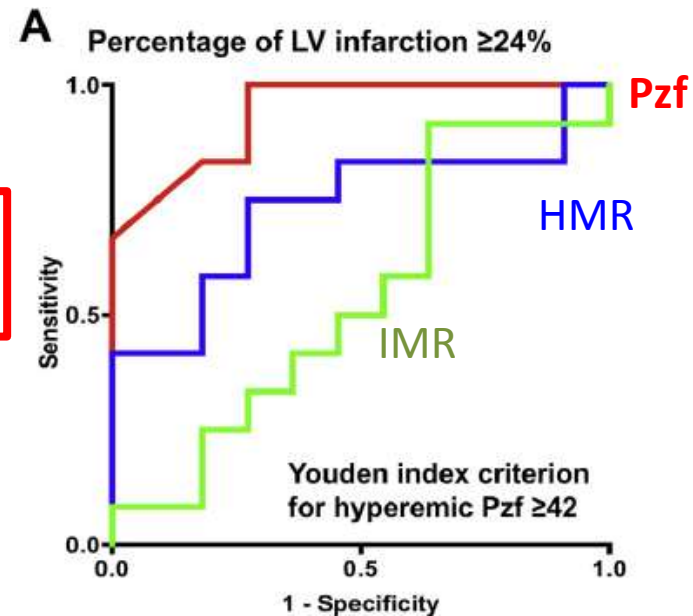
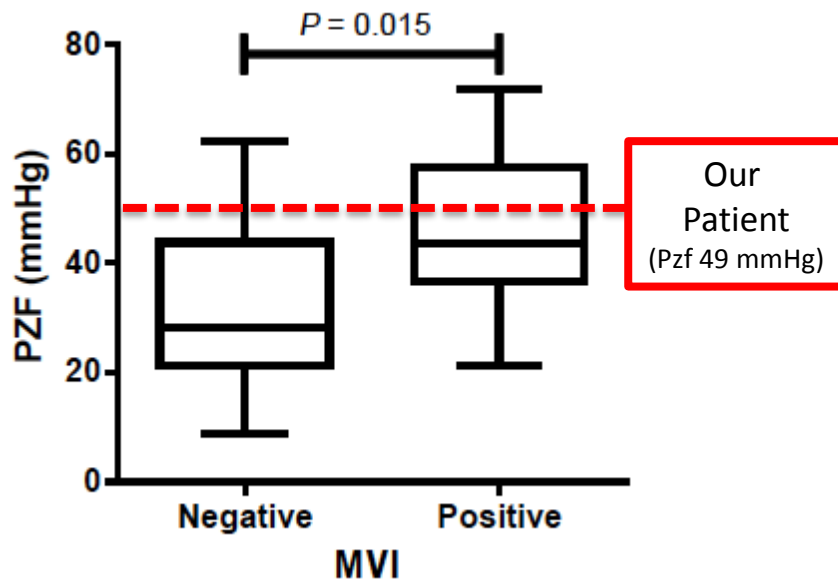
Factors affecting coronary physiology in STEMI



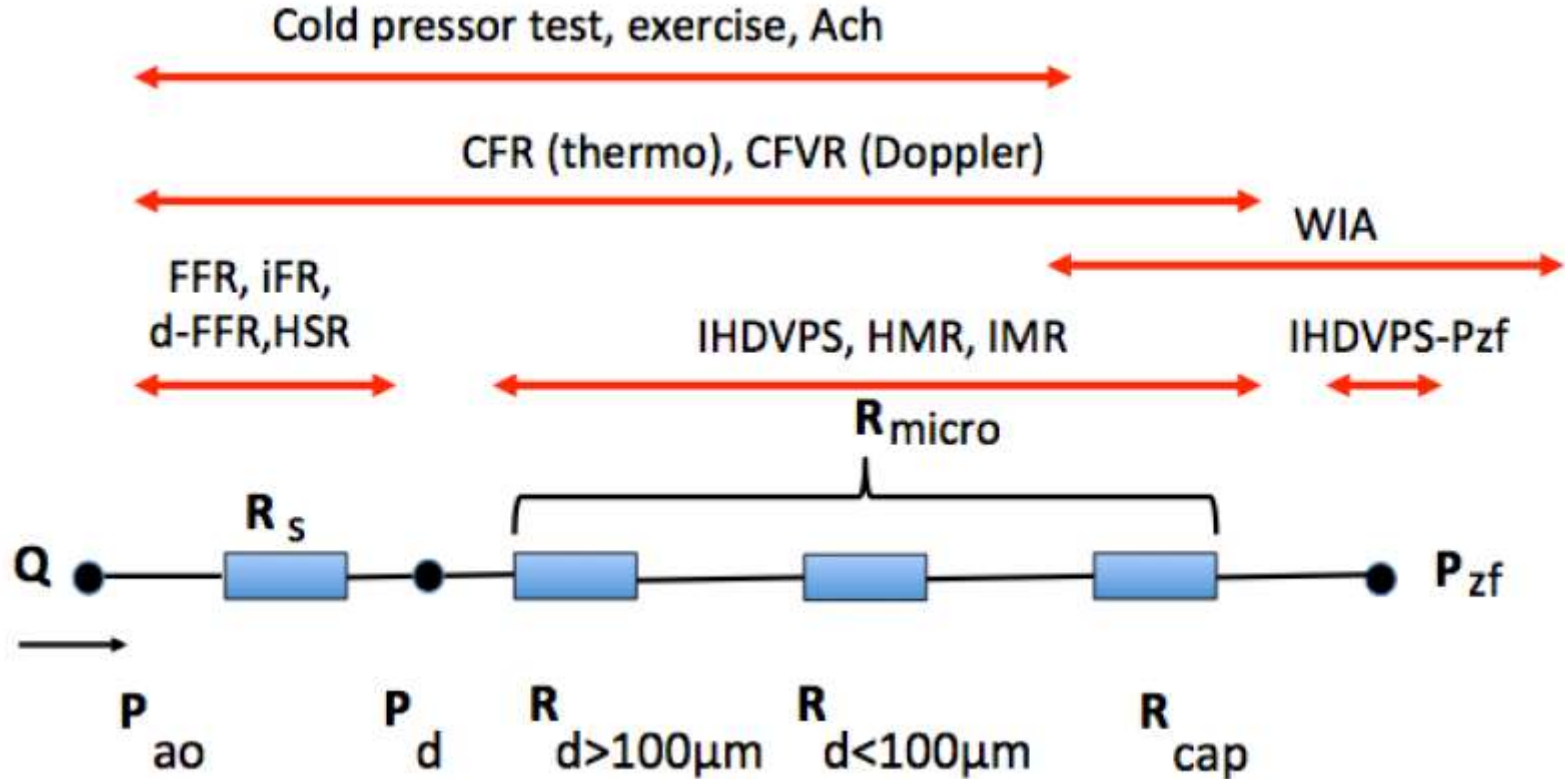
Coronary angiography



Zero flow pressure (Pzf) predicts MRI-documented no reflow and MI size



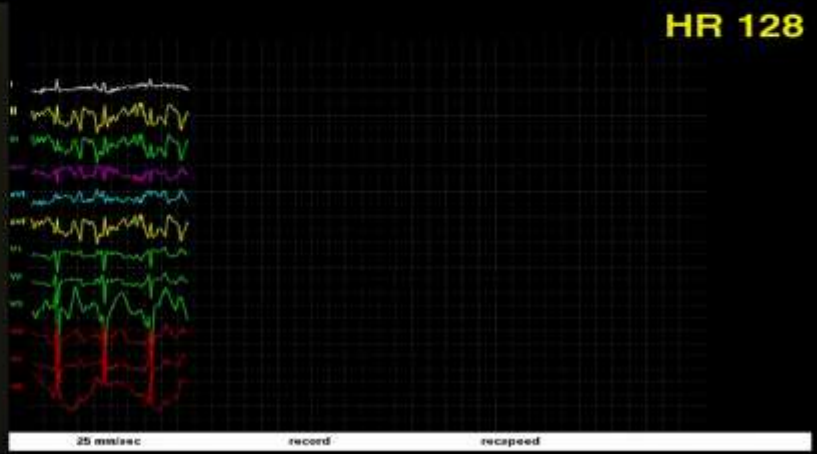
Physiological indices and interrogated coronary domain



Physiological interrogation with exercise at HCSC



HR 128



*Thank you for
your attention!*

