



Pressure measurements in Interventional Cardiology

11th April 2022

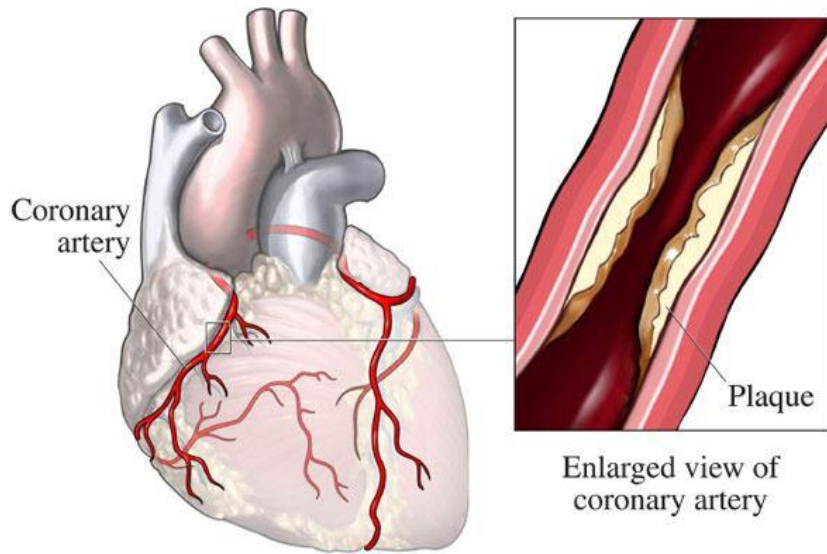
Mauro Sette, Dr. Ing., CEO @ Medyria



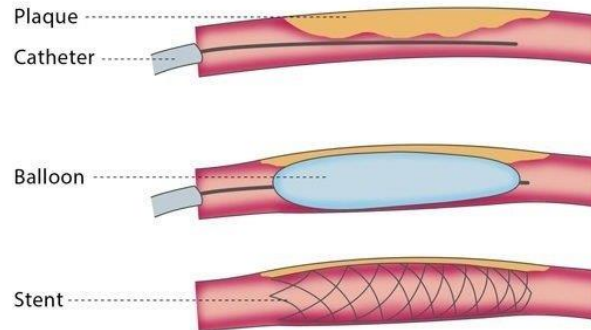


Decision making

Clinical background



Angioplasty and stenting

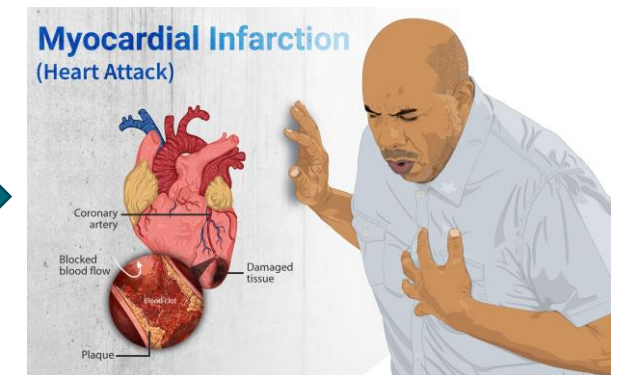


	Incidence of ISR in bare stents (n = 293 lesions)	TVR for ISR in bare stents at 1 year
Focal	42%	19.1%
Diffuse	21%	34.5%
Proliferative	30%	50.0%
Total occlusion	7%	83.4%

Figure 1. Classification and incidence of in-stent restenosis (ISR) in bare stents according to

Decision

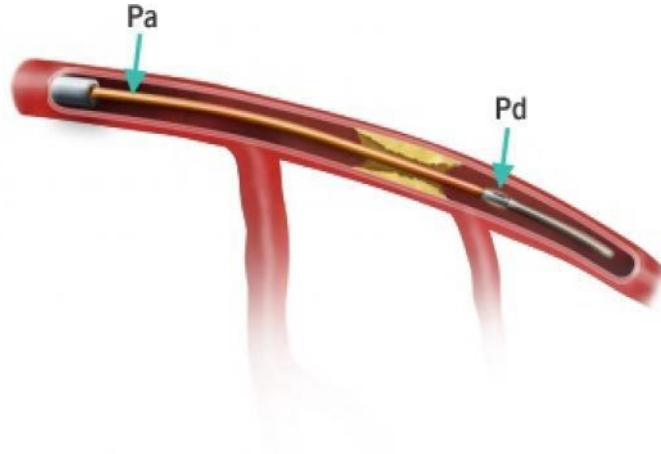
Risk





FFR

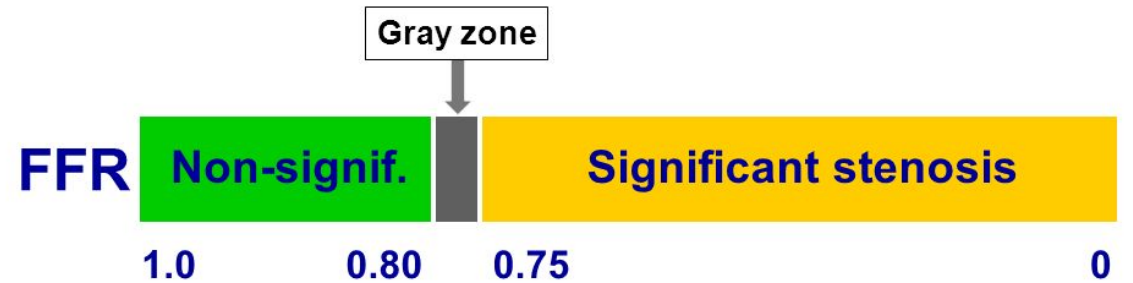
$$\text{FFR} = \frac{\text{Distal Coronary Pressure (Pd)}}{\text{Proximal Coronary Pressure (Pa)}} \\ \text{(During Maximum Hyperemia)}$$



Clinical background

Physiologic lesion assessment

Threshold value of FFR to detect significant stenosis

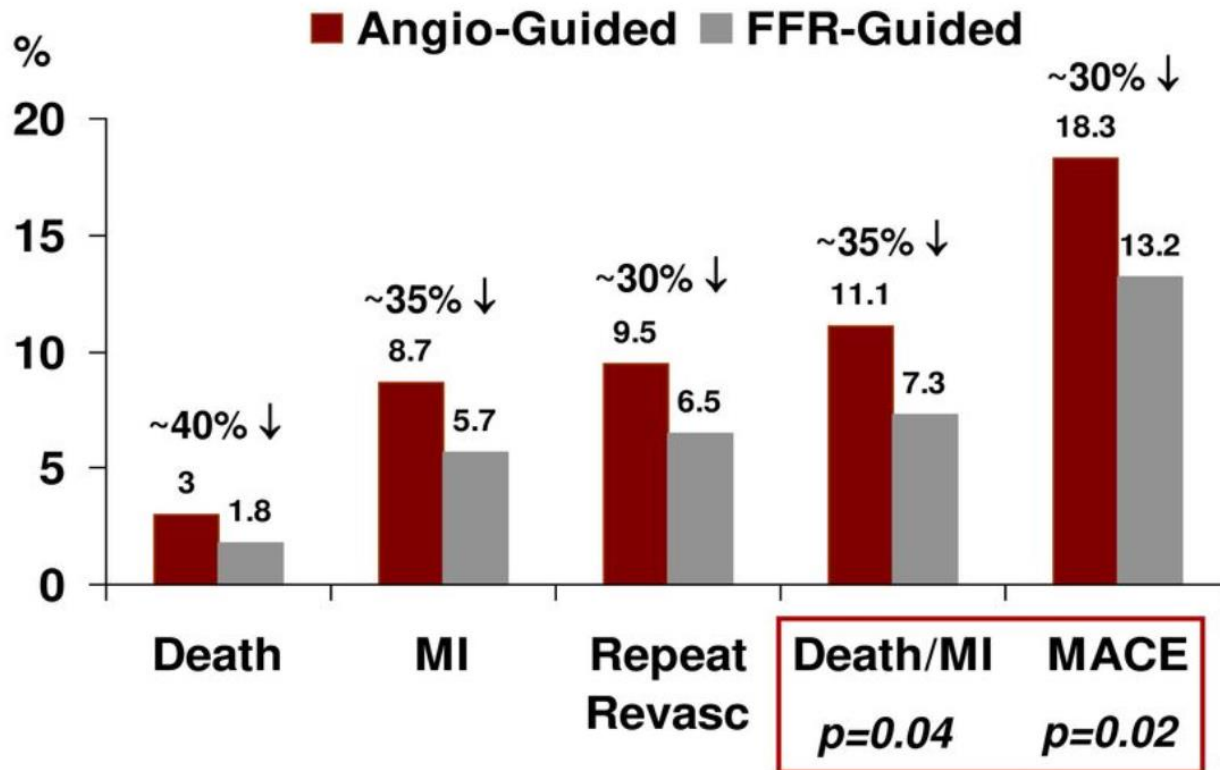


Sensitivity : 90%
Specificity : 100%

Pijls et al, New Engl J Med 1996; 334:1703-1708

FAME Study: One Year Outcomes

1,005 patients with multivessel CAD randomized to FFR or Angio-guided PCI



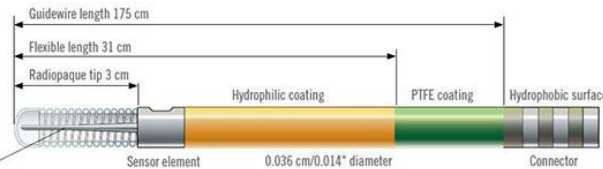
Tonino, et al. New Engl J Med 2009;360:213-24.



Pressure sensor technology

Technology

Technology	Product	Pros.	Cons.
Piezoelectric	Abbott Pressure wire X Philips Omniwire	Easy to implement \$ Cost	Subject to drift Subject to electrical interference
Optical – Fabry perot	Acist - Navvus Boston Scientific – Comet Opsens - Optowire	Very little drift High miniaturization NO interference with electrical devices	\$\$ Costly
Optical - FBG	Hydrix - Phyrari	Very little drift High miniaturization NO interference with electrical devices	\$\$ Costly Dependency of Temperature



μCatheter - monorail

Minimal in-lesion section

Direct measurement of flow and pressure

Pressure sensor OF Fabry Perot

Thermoconvection 2D flow velocity sensor (own IP)



Blood or fluid flow



$$W = h(v) * \Delta T$$

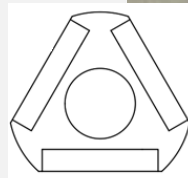
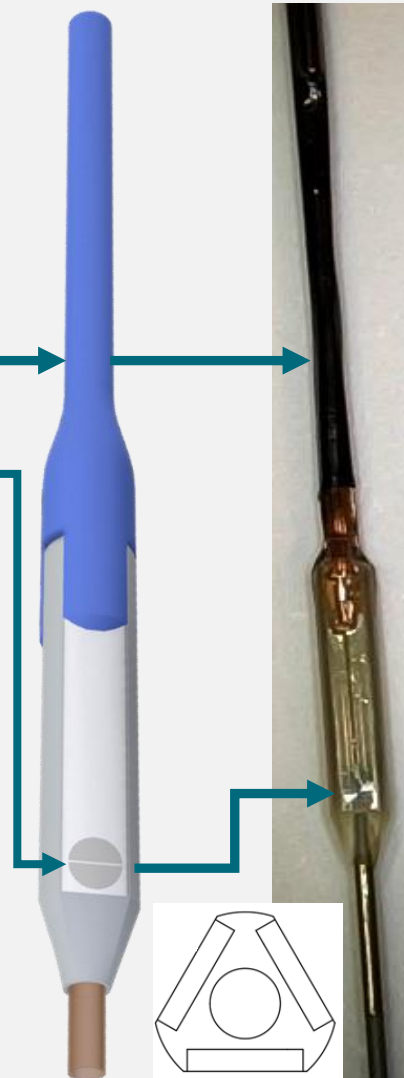
Sensor

✓ -1.5-1.5 m/s Range

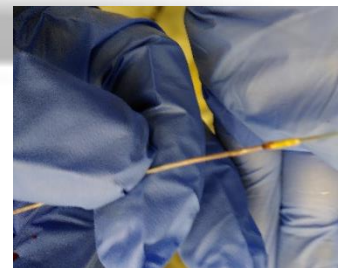
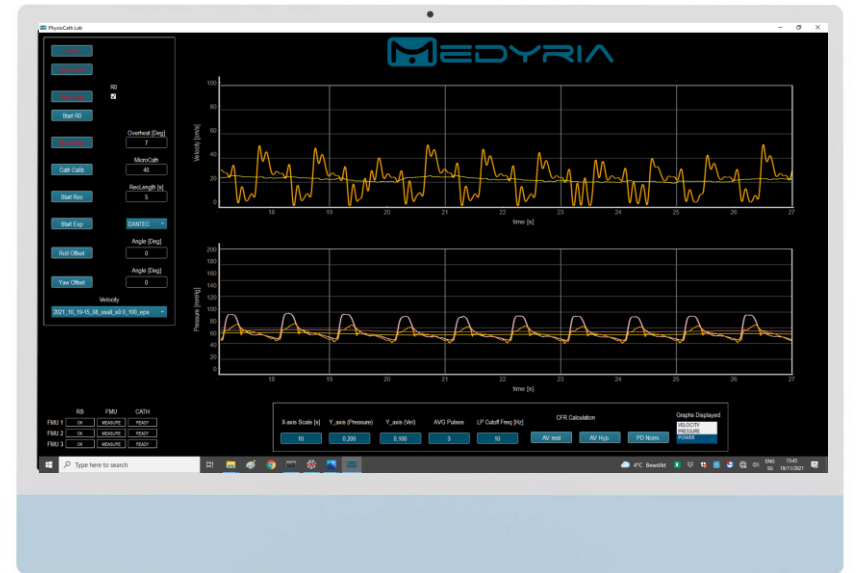
✓ 2.5% Accuracy

✓ >10Hz Bandwidth

✓ 0.5 mm Width



Artificial Intelligence – ML Signal processing





Committed to improved
patient outcomes

MAURO SETTE, CEO/CTO

Mauro.Sette@medyria.com

+41 77 47 58 407