How I Use Angio-Based Physiology to Guide My Case in the Cath Lab: Practical Appraisal

William F. Fearon, MD
Professor of Medicine
Chief, Interventional Cardiology
Stanford University School of Medicine
Chief, Cardiology Section
VA Palo Alto Health Care System

Disclosures

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

Affiliation/Financial Relationship	**Company**
Grant/Research Support	Abbott, Medtronic NIH R61 HL139929-01A1 (PI)
Consulting Fees/Honoraria	CathWorks (previous), HeartFlow
Major Stock Shareholder/Equity	
Royalty Income	
Ownership/Founder	
Intellectual Property Rights	
Other Financial Benefit	

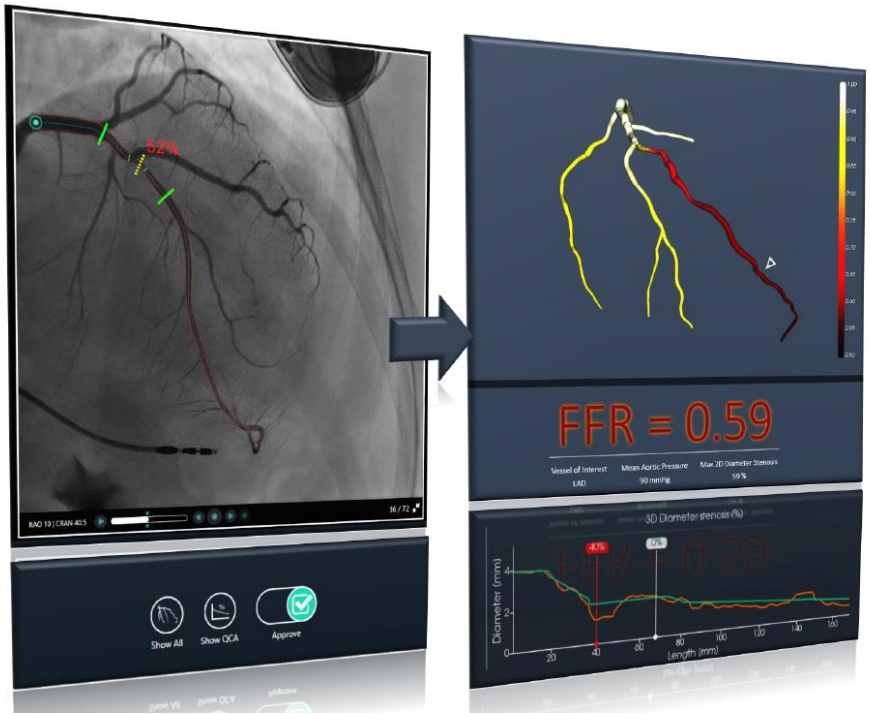
Why isn't Coronary Physiology Used More?

- It takes time…
- Wire handling characteristics…
- Pressure drift is frustrating…
- Side effects of adenosine…
- It is expensive…
- There is a small risk…

Coronary Pressure Wire

Angiography-Derived FFR

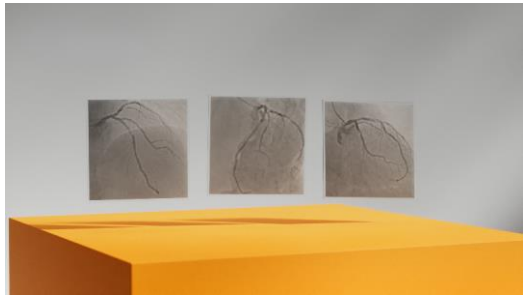
Measurement of FFR without the need of a pressure wire or adenosine



Drug-free, Wire-free Coronary Physiology

1

Optimal 2D Angiography

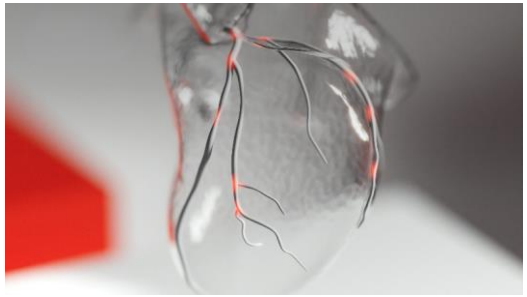


2

3D Model Reconstruction

3

Resistance Analysis

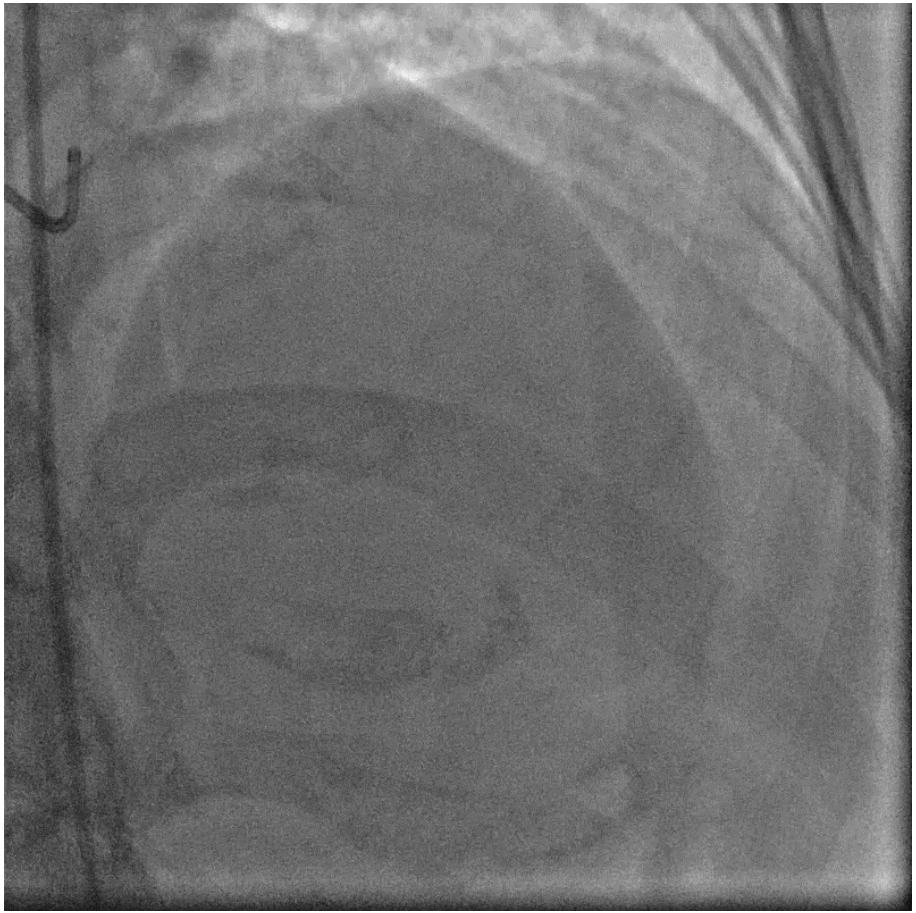


4

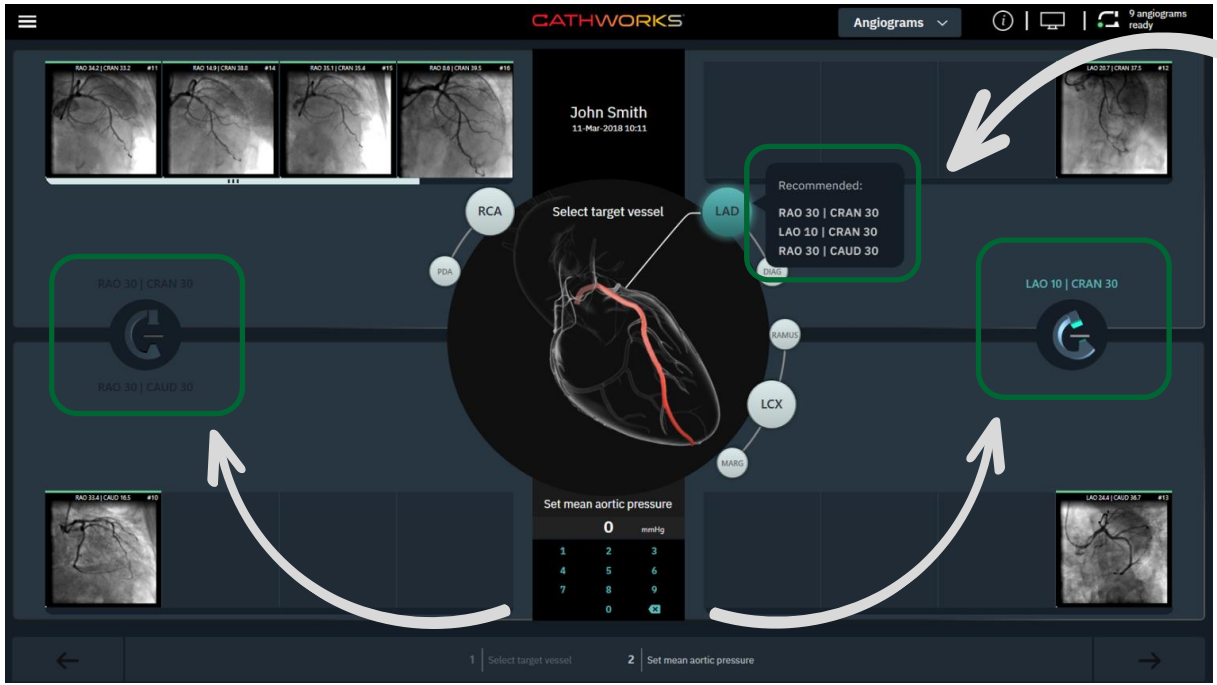
Comprehensive Physiological Assessment

Case Presentation

- 43 yo woman with HTN, dyslipidemia, diabetes and kidney transplantation in 2016
- History of PCI of her LAD at an outside hospital
- Has developed daily exertional angina despite beta blocker and long-acting nitrate
- PET scan revealed small, moderate area of ischemia in the anterior wall
- Referred for cath…

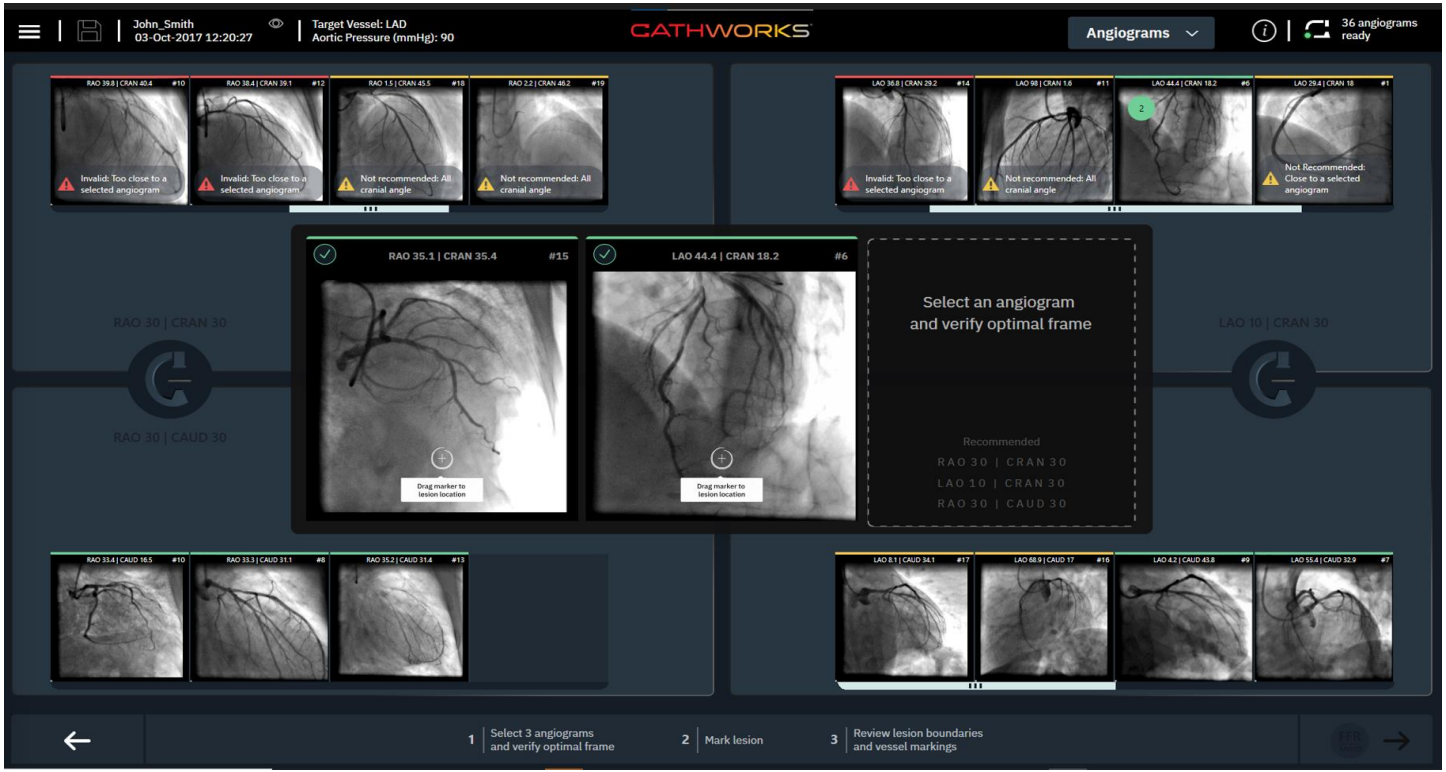


Pre-processing Angiograms

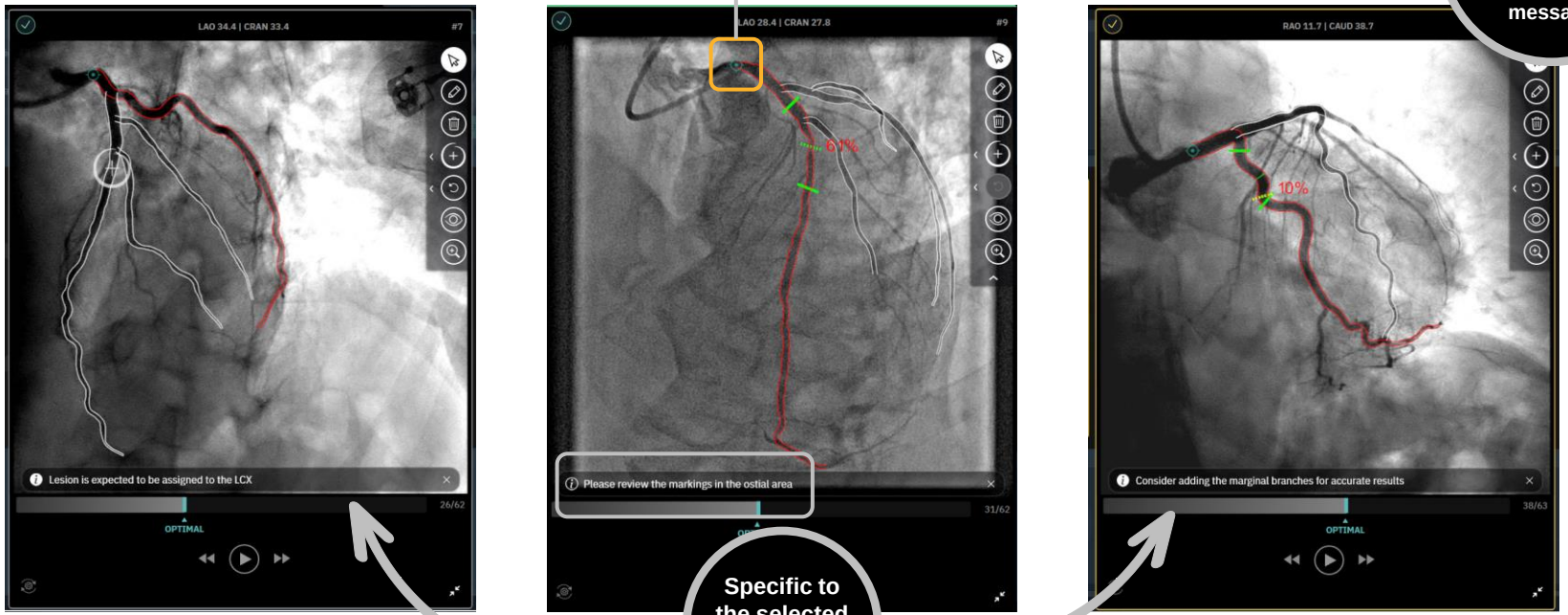


Hover over the target vessel

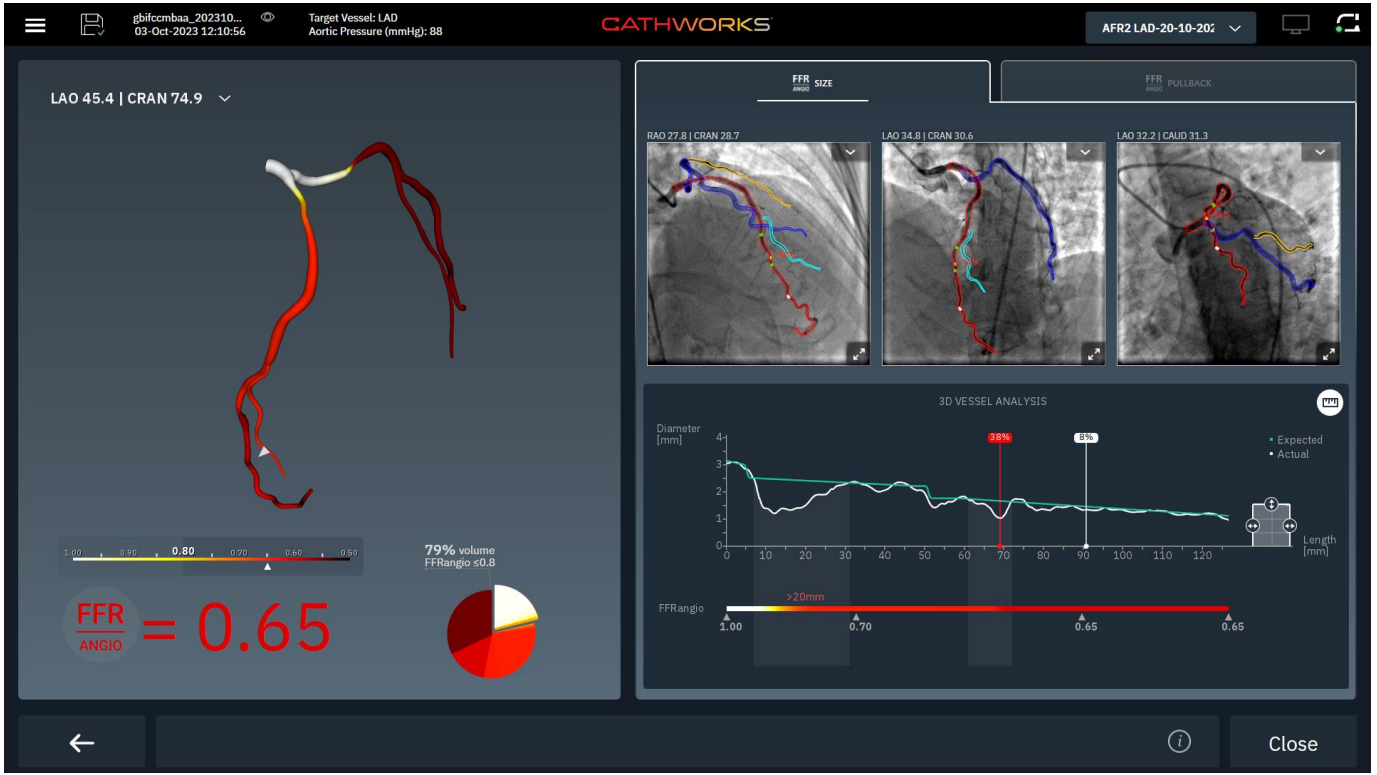
Dynamic Selection of Angiograms



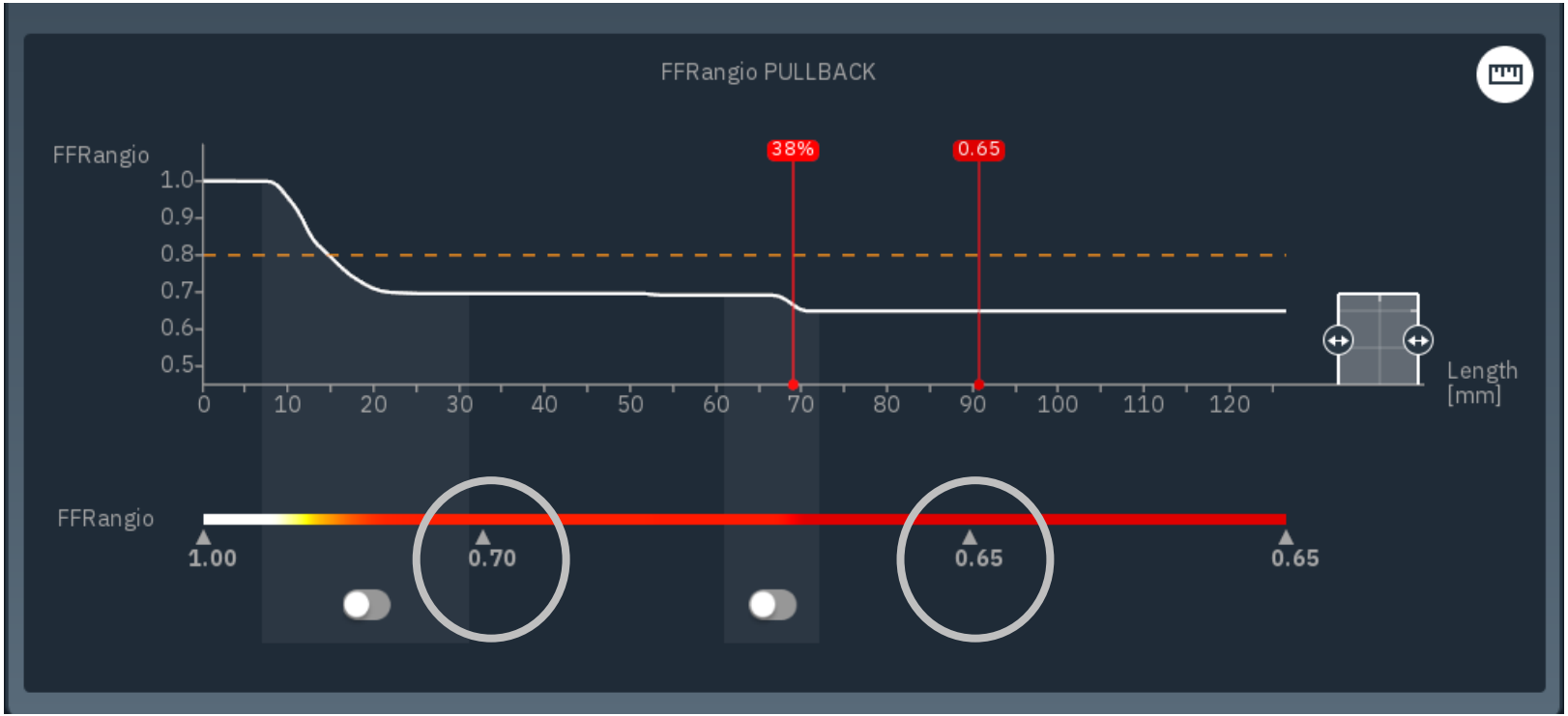
AI Communication and Editing Toolbar



Back to Our Case…

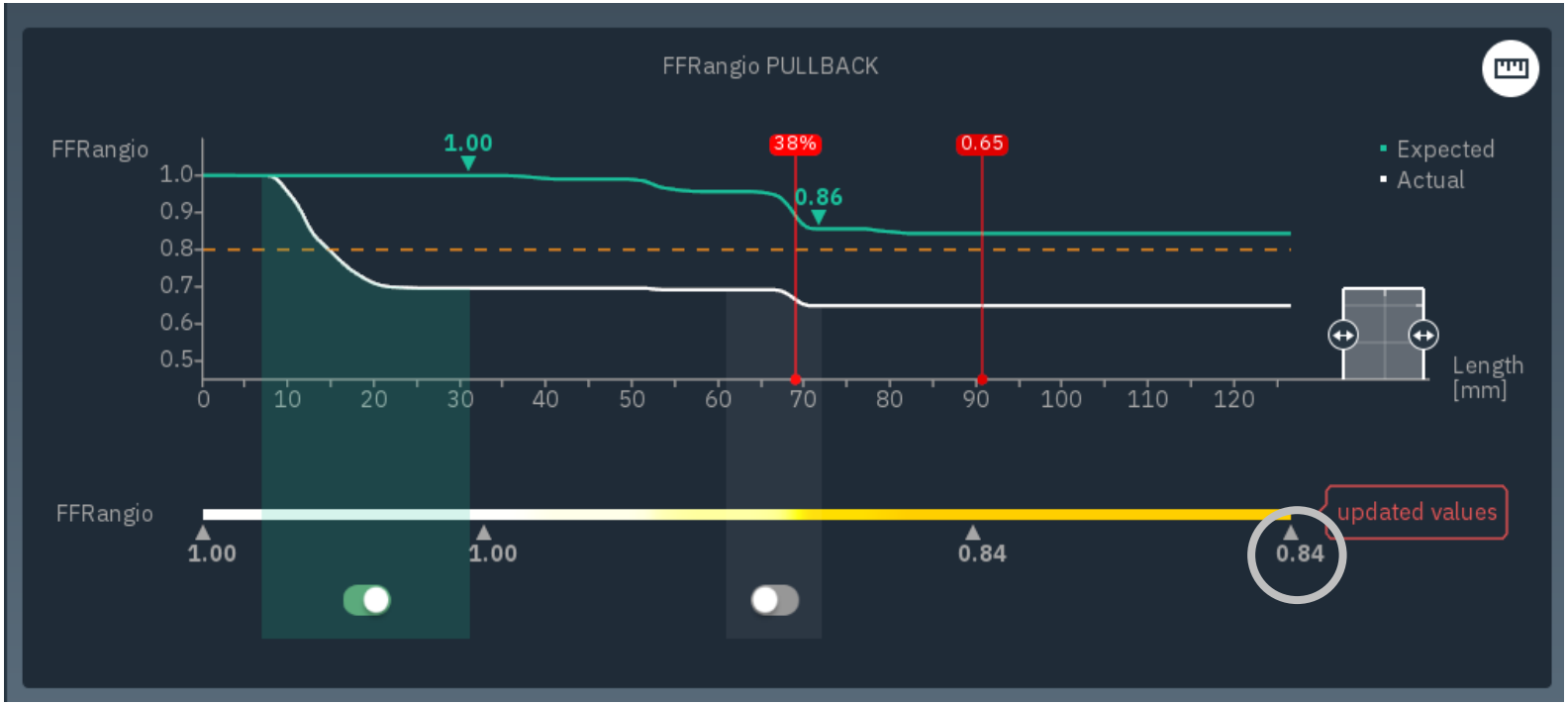


Pullback Curve



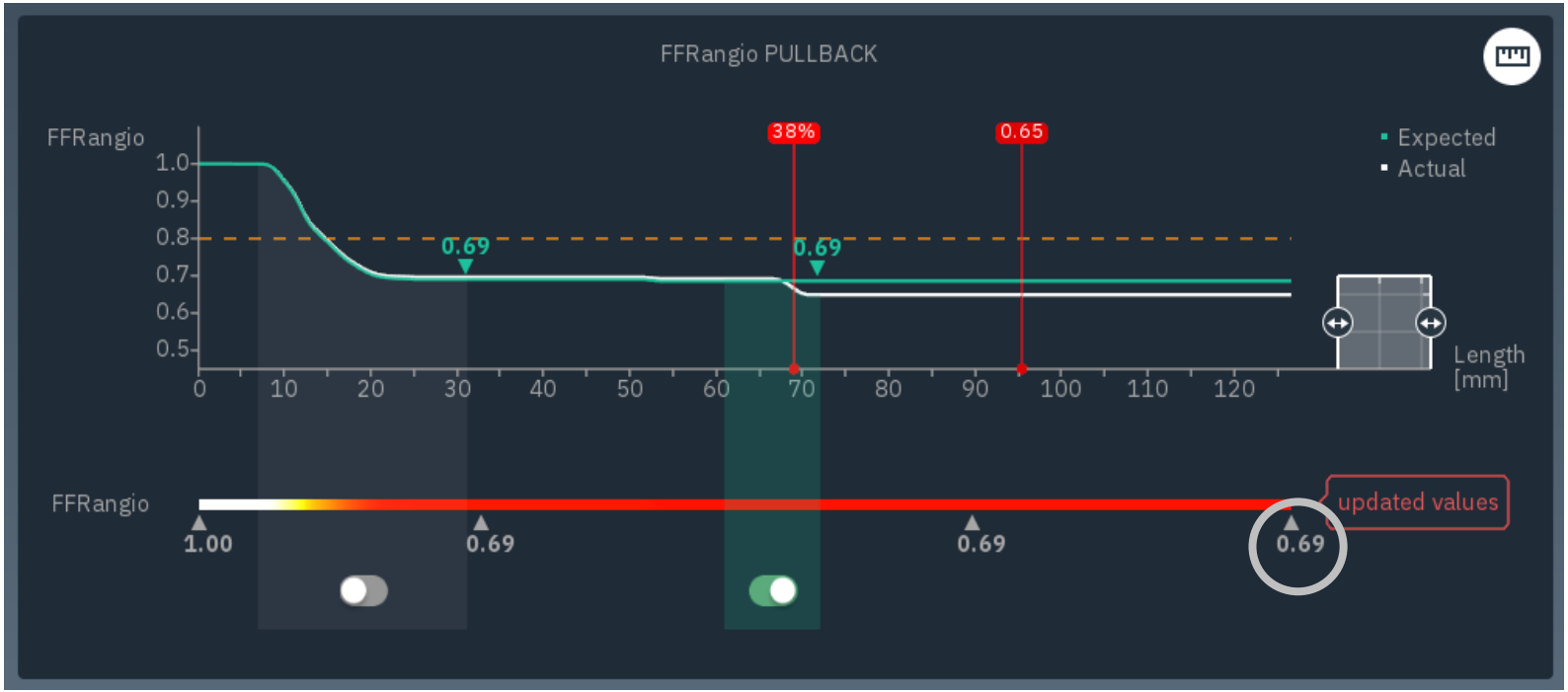
Pullback Curve

Virtual Stenting of the Proximal Lesion



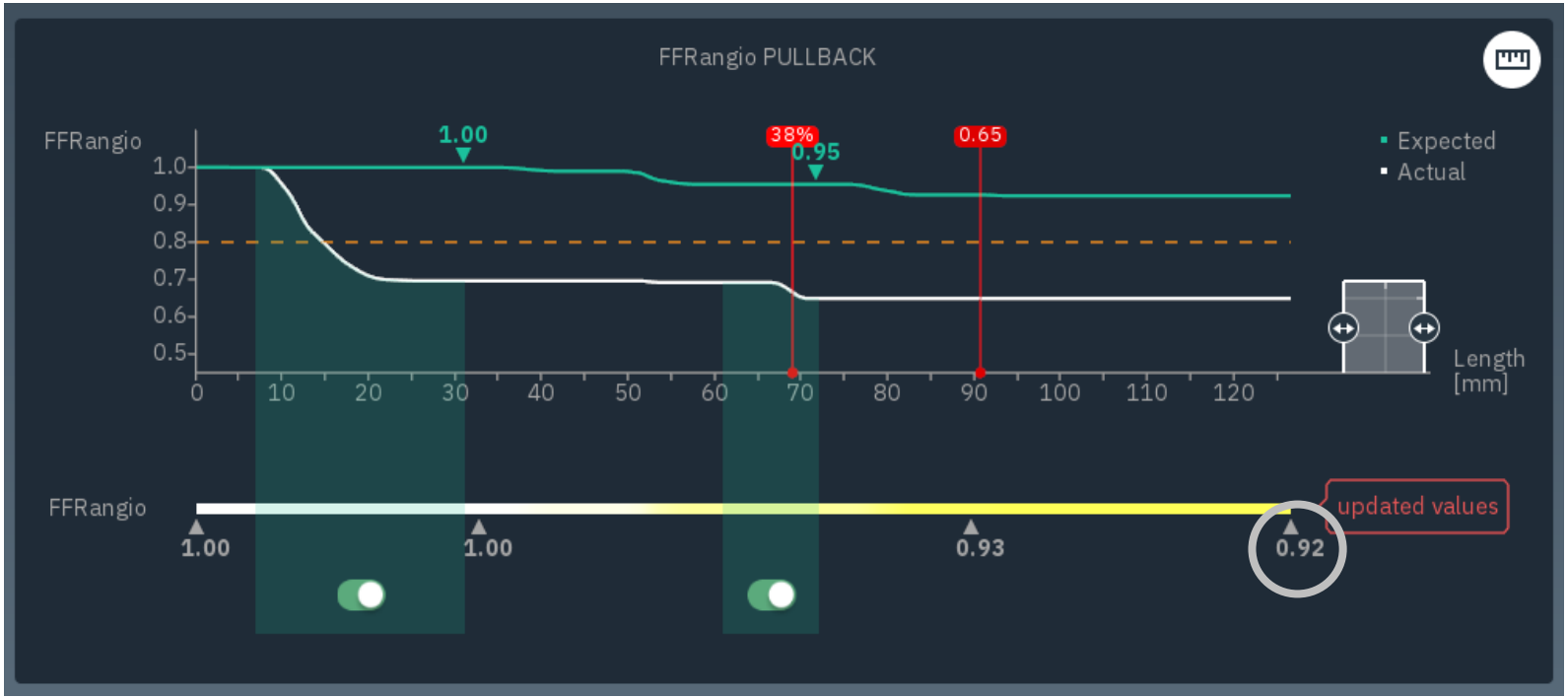
Pullback Curve

Virtual Stenting of the Distal Lesion

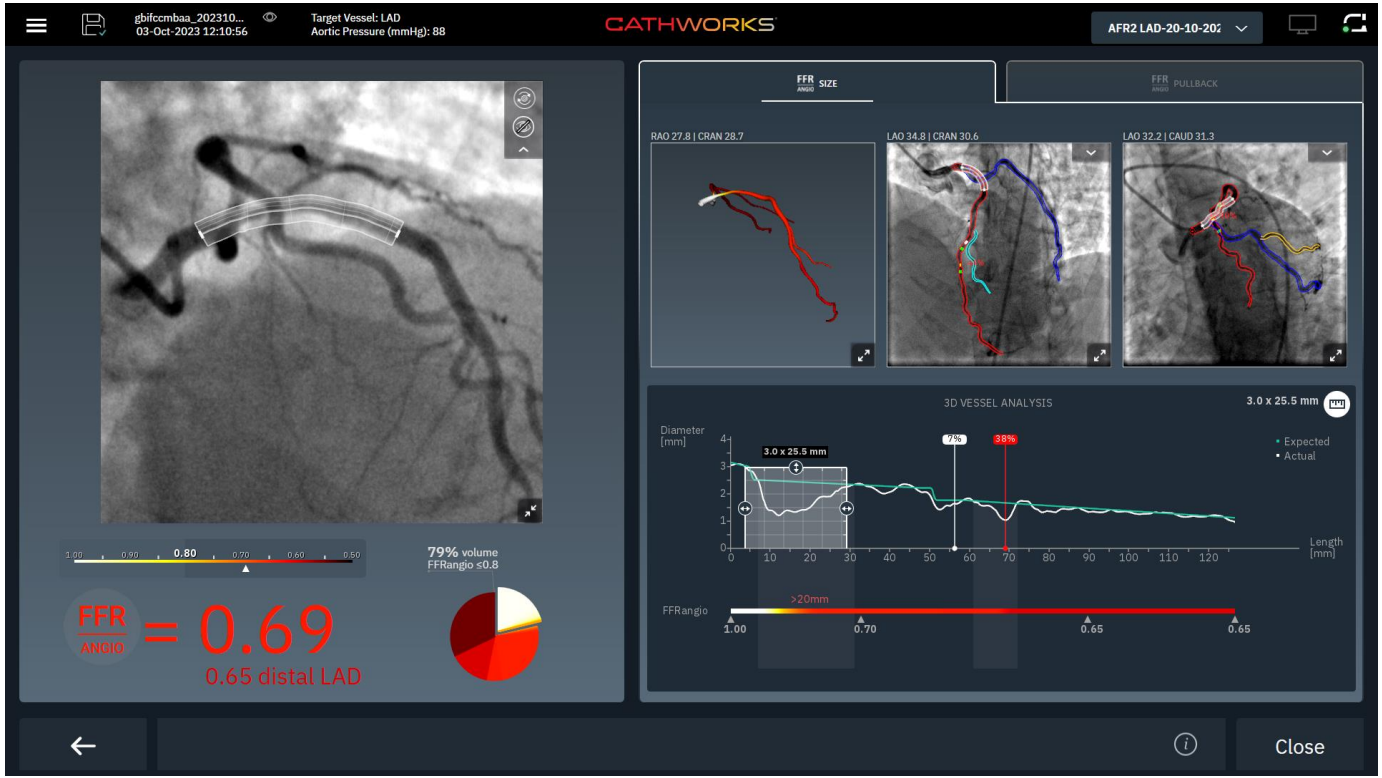


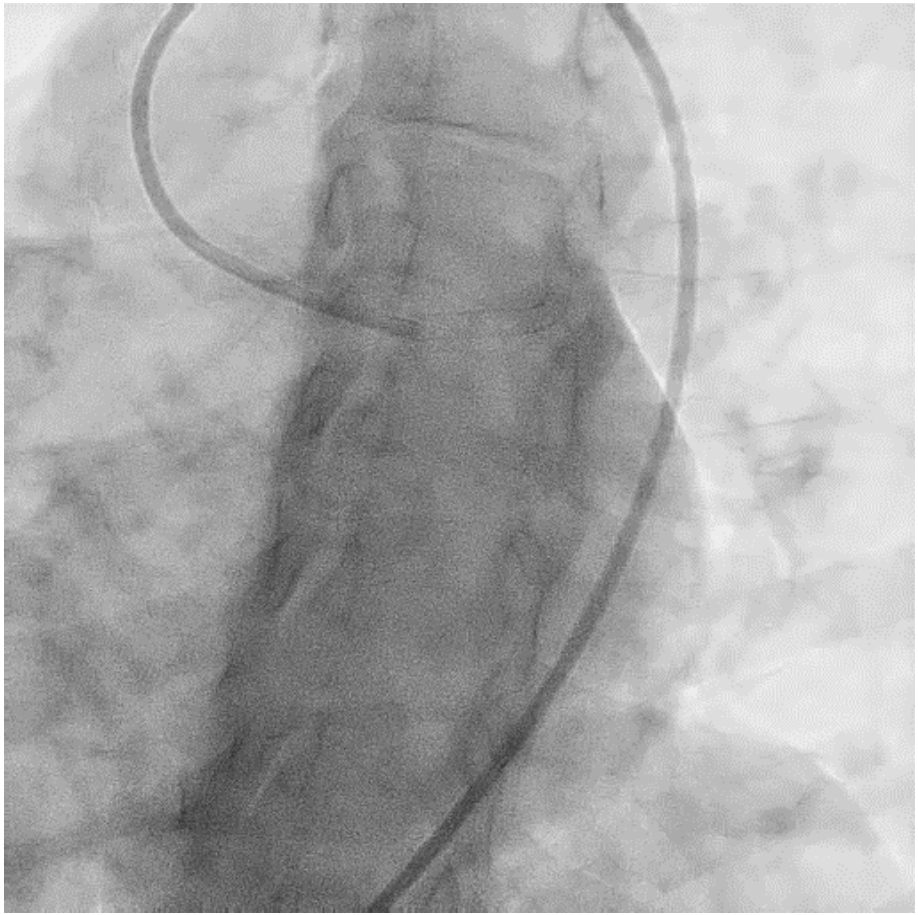
Pullback Curve

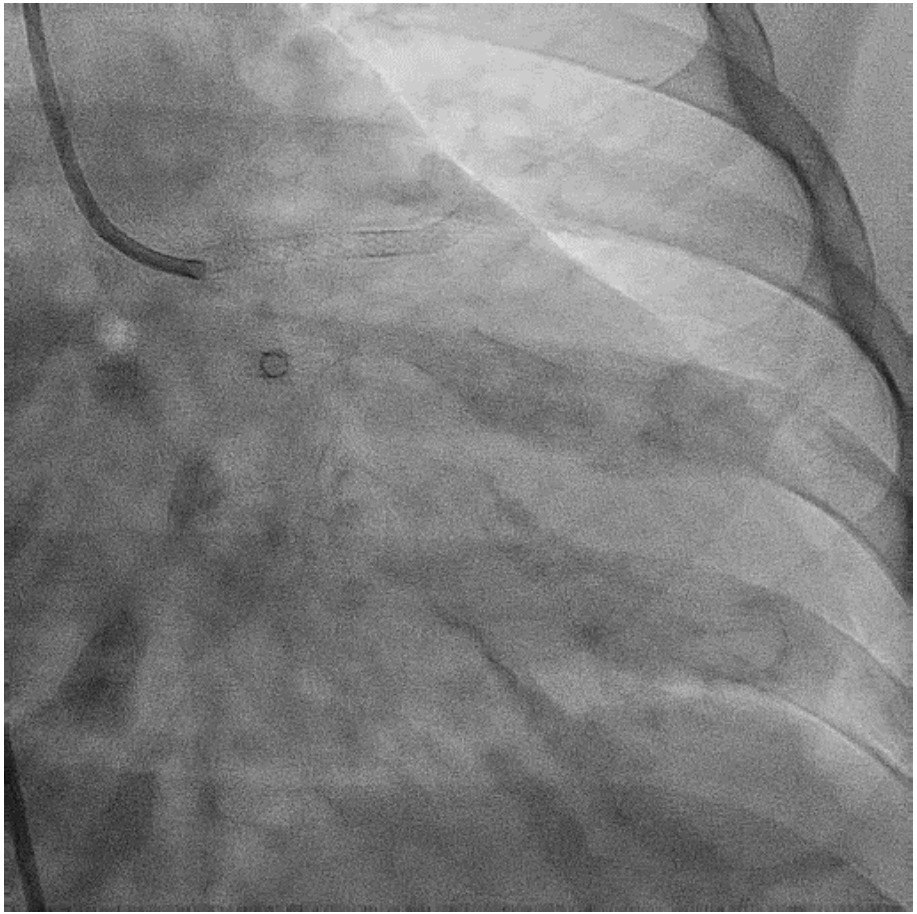
Virtual Stenting of Both Lesions



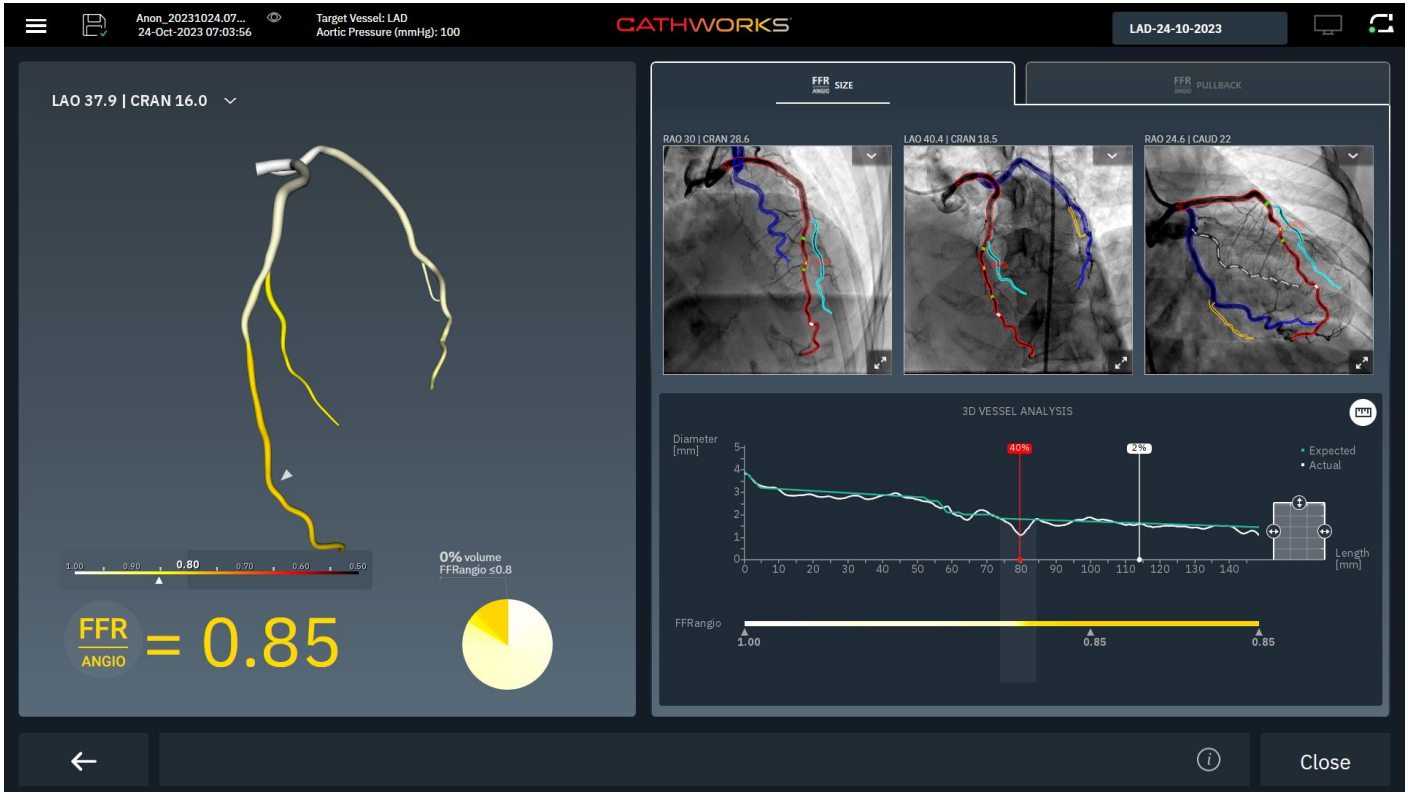
Measuring Tool



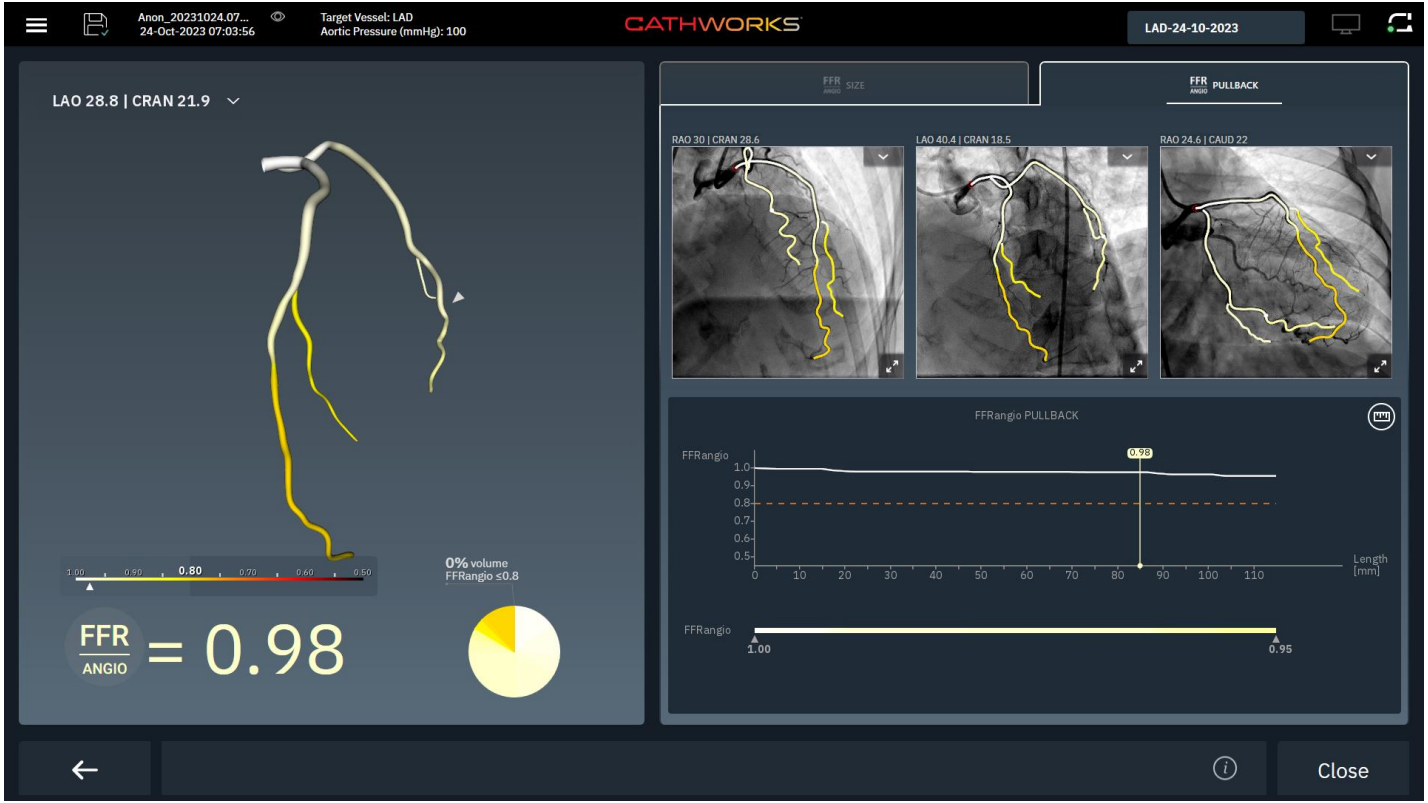




FFR_{angio} Post-PCI of Proximal LAD



FFR_{angio} Post-PCI of Proximal LCx



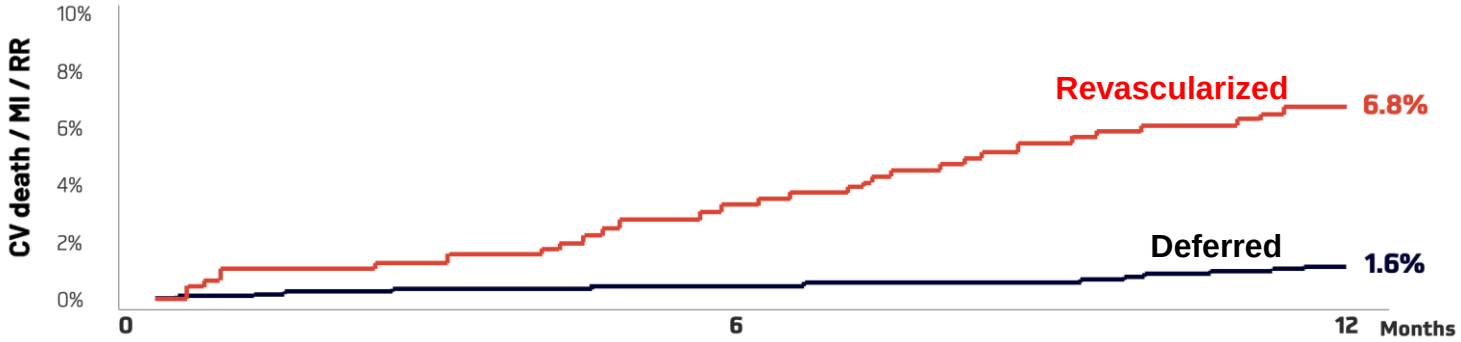
Outcomes

The FAST-FFR trial demonstrated a high sensitivity, specificity and accuracy of FFRangio compared with coronary pressure wire-based physiology

Characteristic	
Sensitivity	**93.5%** (87.8, 96.6)
Specificity	**91.2%** (86.0, 94.6)
Diagnostic Accuracy	**92.2%** (88.7, 94.8)
Positive Predictive Value	89.0% (82.6, 93.2)
Negative Predictive Value	94.8% (90.3, 97.3)

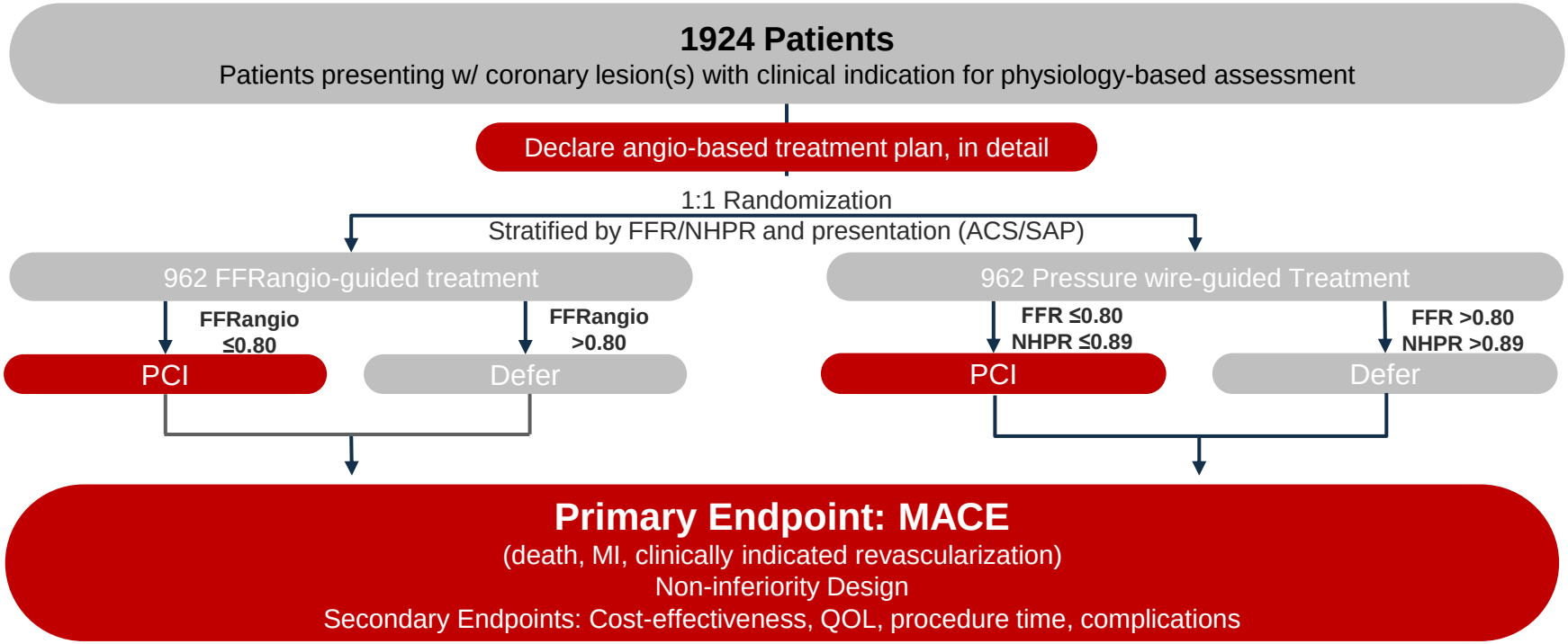
Grey zone Accuracy (0.75-0.85)	
Sensitivity	88.5%
Specificity	85.1%
Diagnostic Accuracy	86.9%

1-Year Clinical Outcomes Study – Results



	Deferred (n=888)	Revascularized (n=547)
CV death / MI / RR	1.6%	6.8%
CV death	0.4%	0%
Myocardial infraction	0.1%	1.0%
Repeat revascularization	1.2%	6.8%
Target vessel MI	0%	0.4%
Target vessel revascularization	0.3%	2.3%
Target lesion revascularization	0.3%	0.9%

ALL-RISE Trial



1924 patient to be enrolled in up to 60 sites globally, with a limit of up to 200 patients per site.

Conclusion

- FFRangio can allow efficient and accurate assessment of your multivessel CAD patient.
- The pullback curve and virtual stenting and measurement tool have potential to improve pre-PCI planning and prediction of outcome.
- There are excellent data demonstrating correlation with pressure wire-based FFR. The ALL-RISE study will provide clinical outcomes data.

Thank You!