

FFR Measurement of Collateral Donor Artery During Arterial Hypotension.

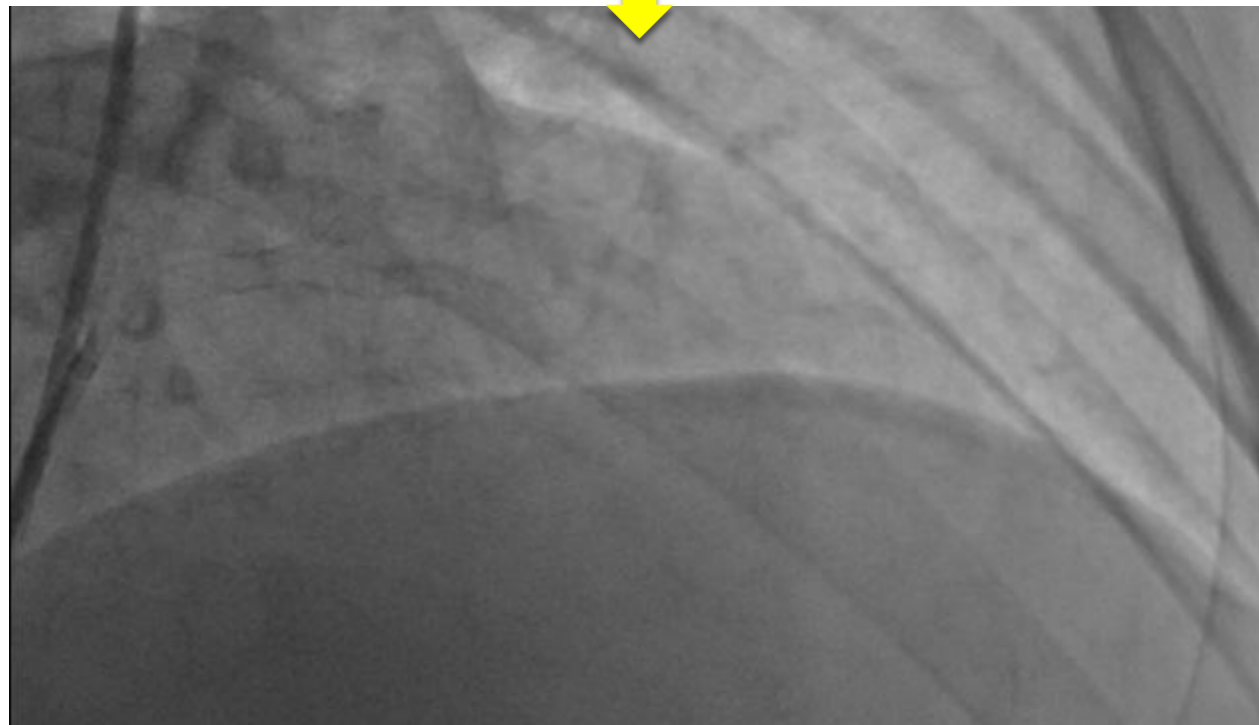
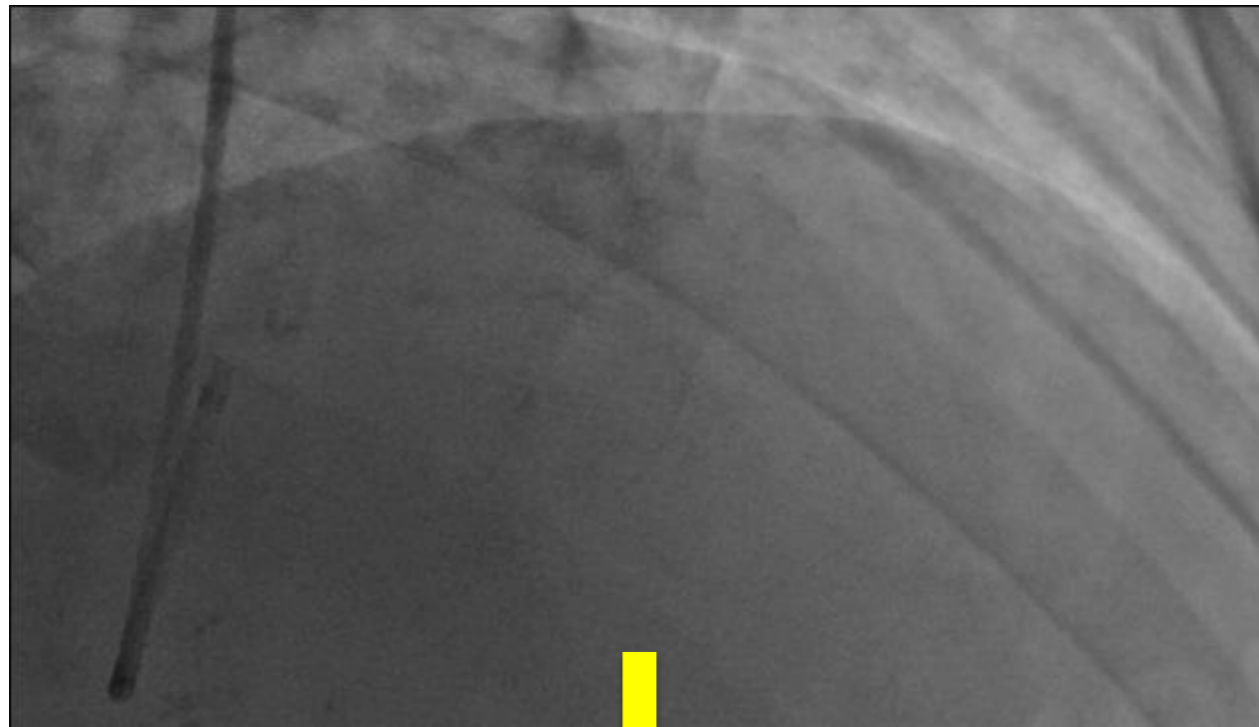
Which value to be accepted?

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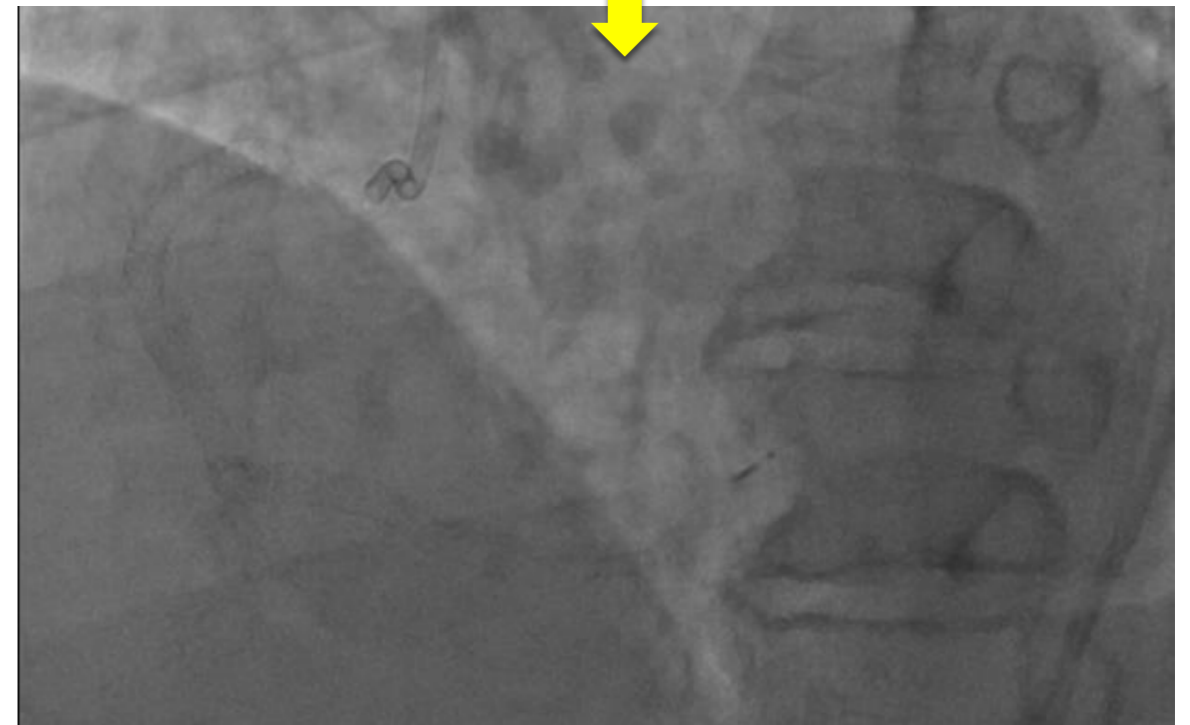
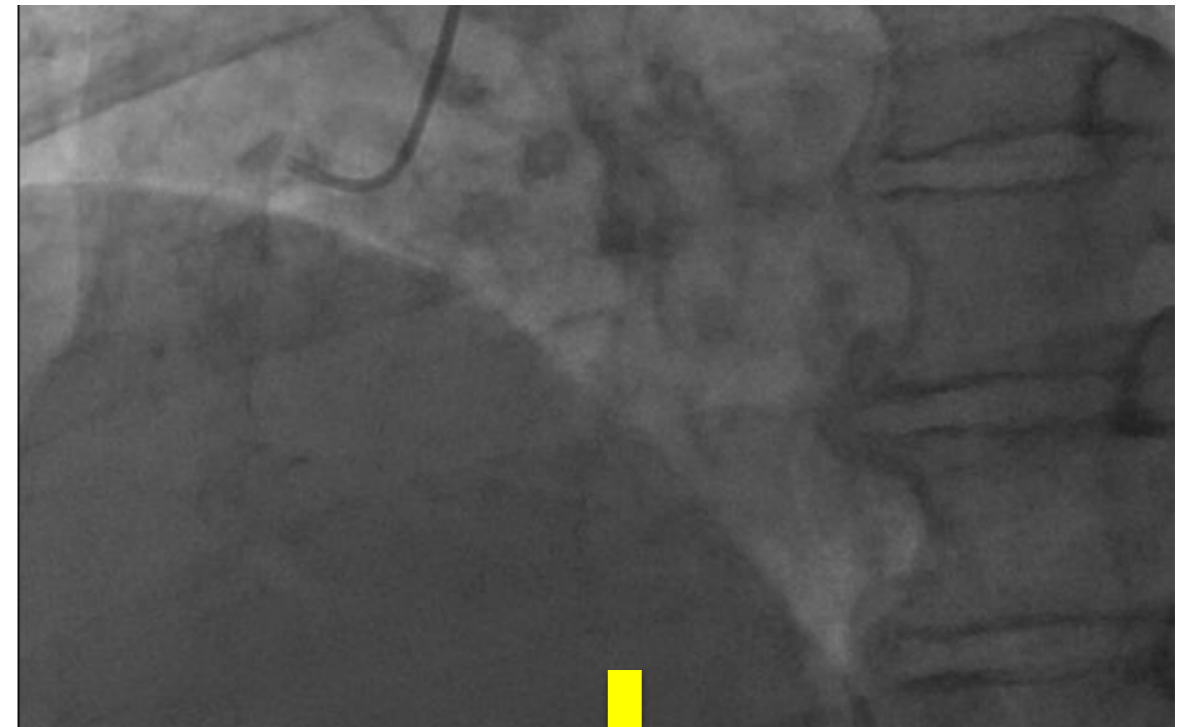
An asymptomatic male in his late 40's

- **Admitted for routine follow-up coronary angio.**
- **Coronary risks: T2DM, HTN, ESKD on HD**
- **Prior multi-vessel PCI for angina**
 - 2014/10 LAD/Diag (DK crush)
 - 2014/12 RCA-CTO (Full metal jacket)
- **LVEF 48%, inferior wall RWMA, moderate LVH**

Prior PCI to LAD/Diag and RCA



DK-Crush (Nobori+Resolute/Resolute)

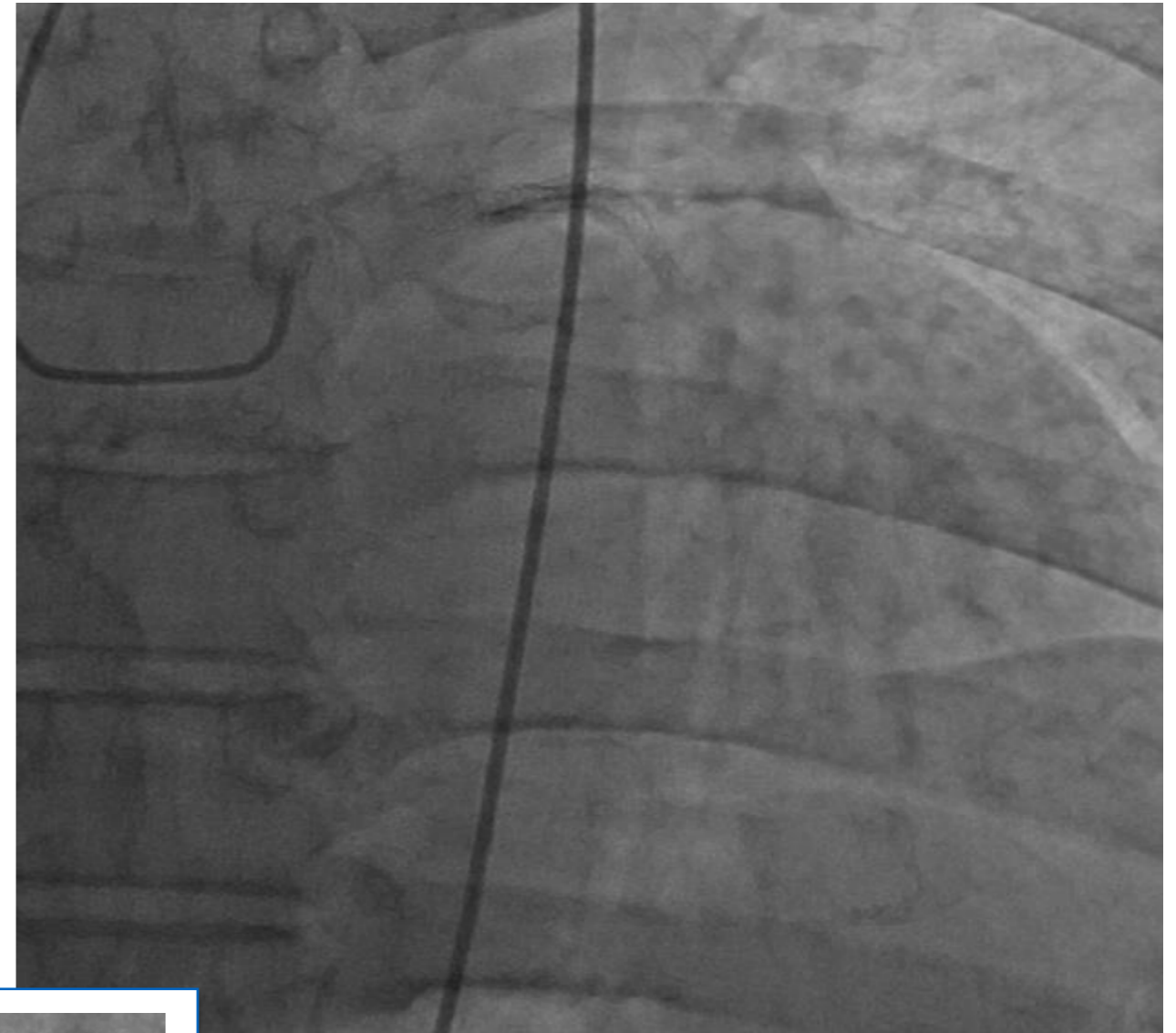
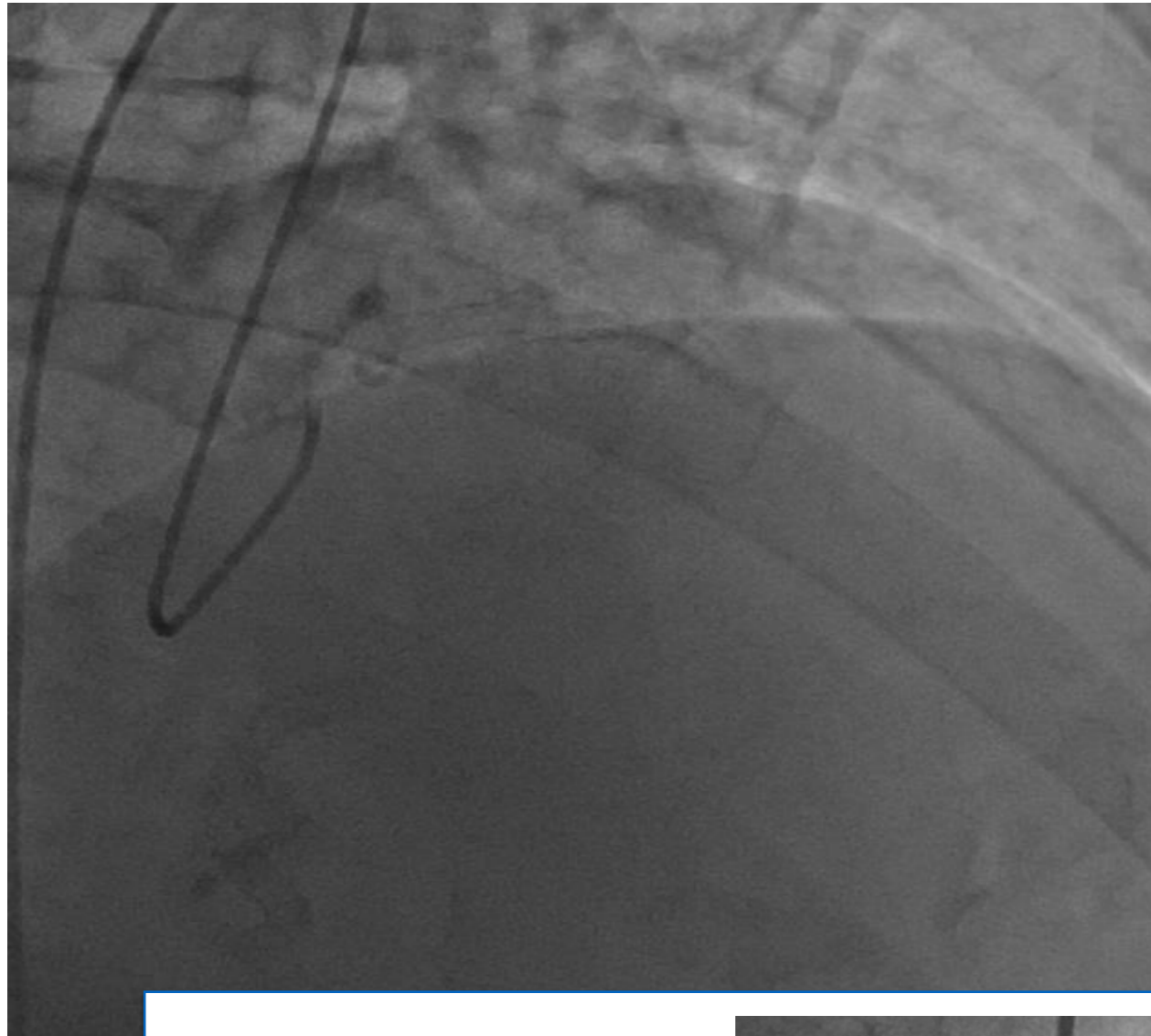


Nobori + Promus(E)x4

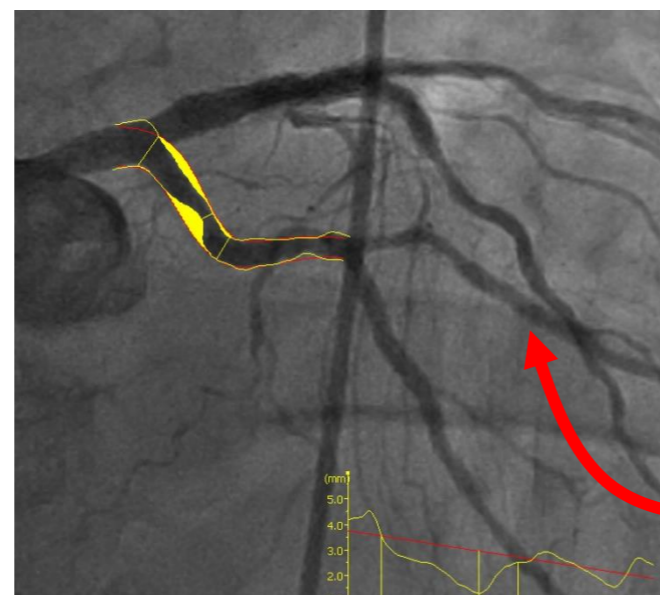
Routine Follow-up CAG: occluded RCA



Patent LAD/D1 bifurcation stent LCX proximal intermediate lesion (de novo)



RVD 2.94mm
MLD 1.28mm
%DS 56.5%
LL 12.8mm



*LCx: dominant collateral donor artery

→ FFR measurement

RRA approach

5Fr. Diagnostic catheter

Pressure wire located @ OM

Pressure Normalization

0:02



FFR 1.0

Pd/Pa 1.0

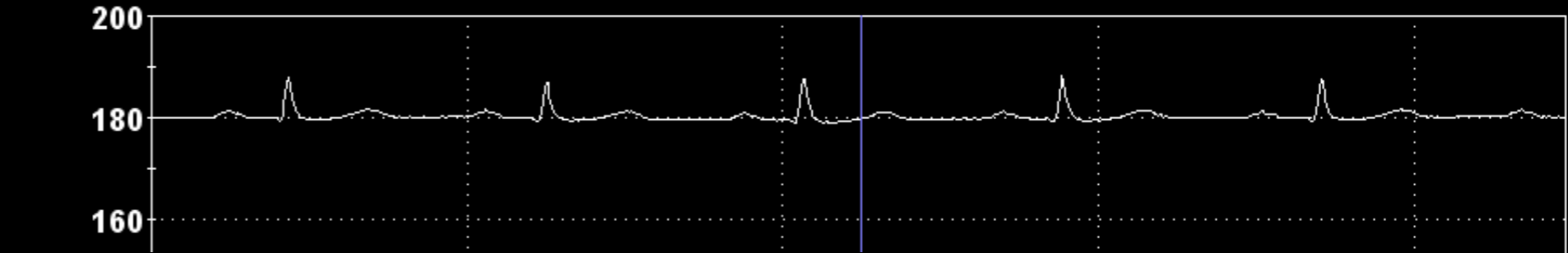
Pa:iPa 59: 66

Pd:iPd 59: 68

Pa-Pd(m) 0

HR 74

List of Runs	iFR	FFR
09:43:21 AM		1.00
09:44:41 AM	0.84	
09:45:40 AM	0.87	
09:46:04 AM	0.86	
09:46:18 AM		0.74



Profound hypotension →
Pressure normalization by norepinephrine i.a.

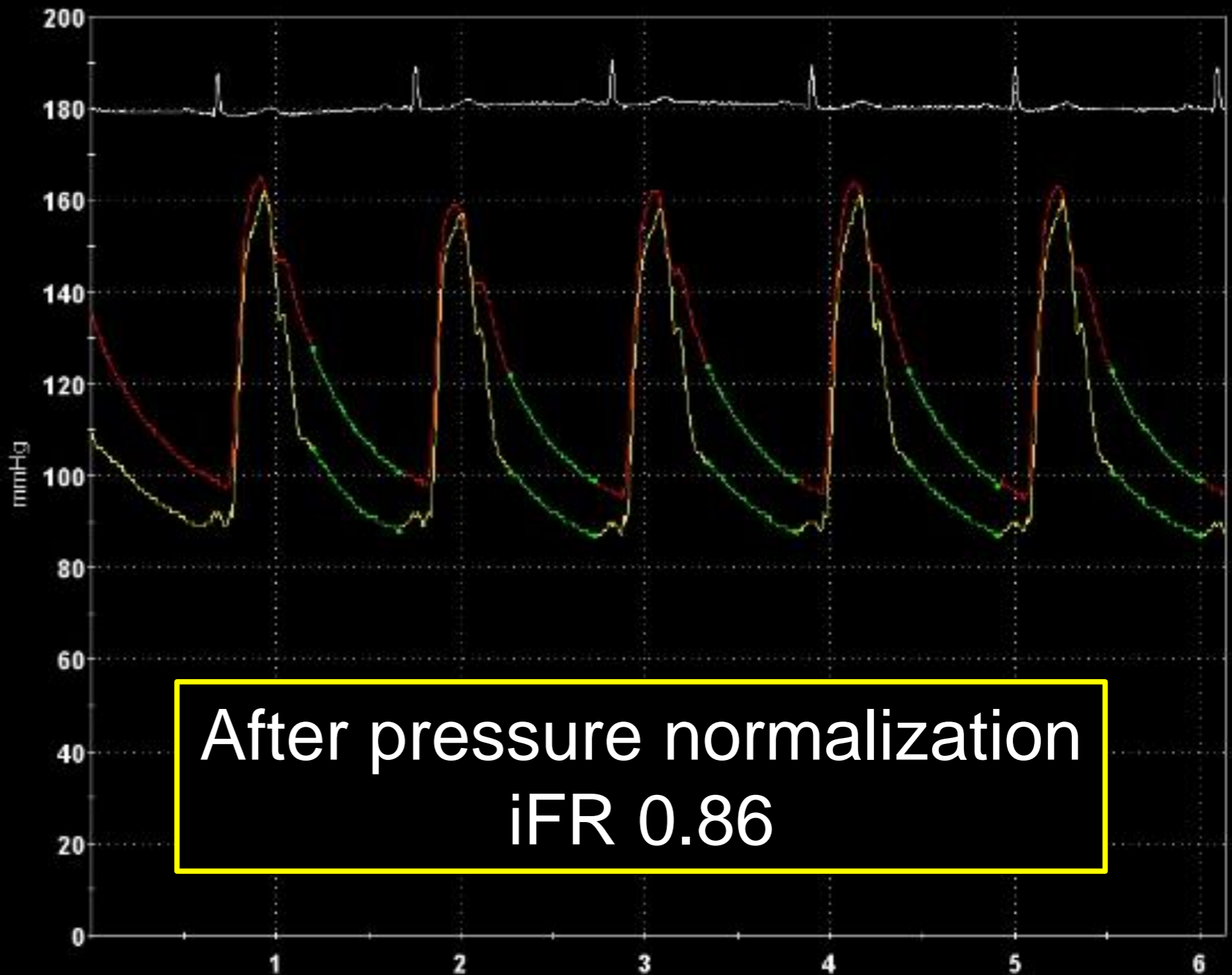


0:06

iFR[®]

0.86

List of Runs	iFR	FFR
09:43:21 AM		1.00
09:44:41 AM	0.84	
09:45:40 AM	0.87	
09:46:04 AM	0.86	
09:46:18 AM		0.74



Live

Options

Save Frame

Settings

Patient

FFR

iFR

Select Mode

Connect pressure plug to PIM

FFR PIM ●

FFR measurement (iv-ATP 150 mcg/kg/min.)

1:22

FFR 0.82

Pd/Pa 0.77

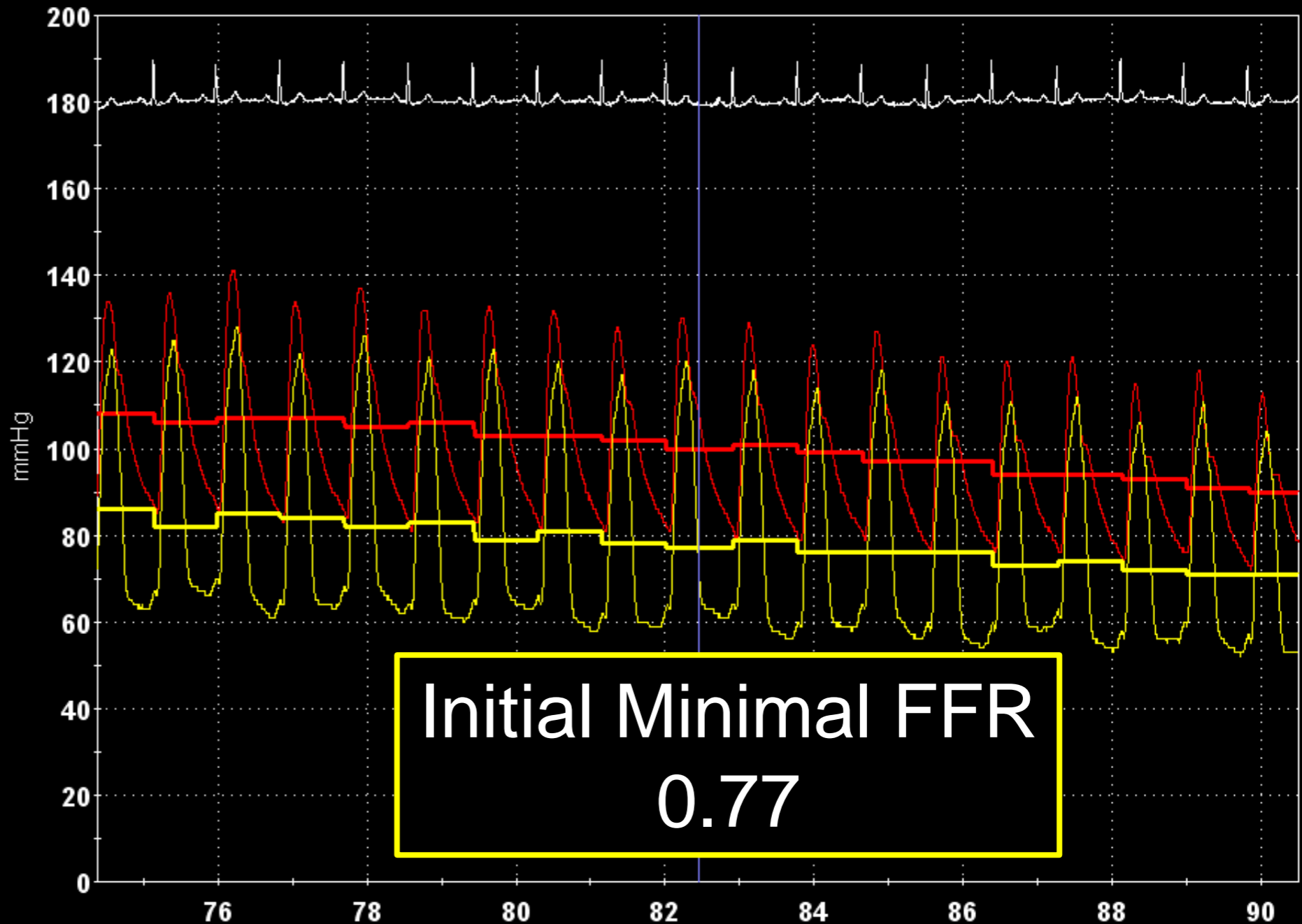
Pa:iPa 100:109

Pd:iPd 77:77

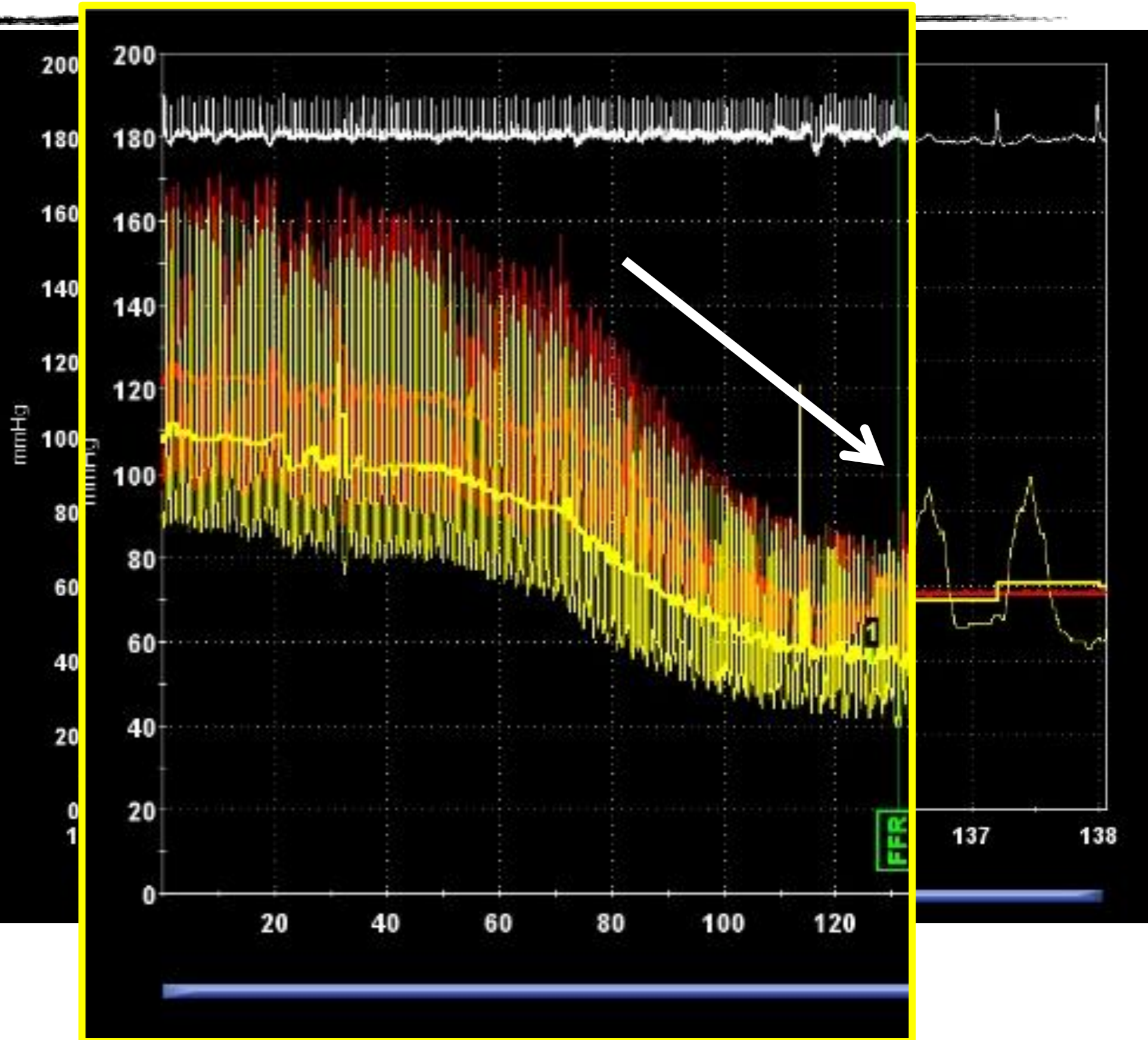
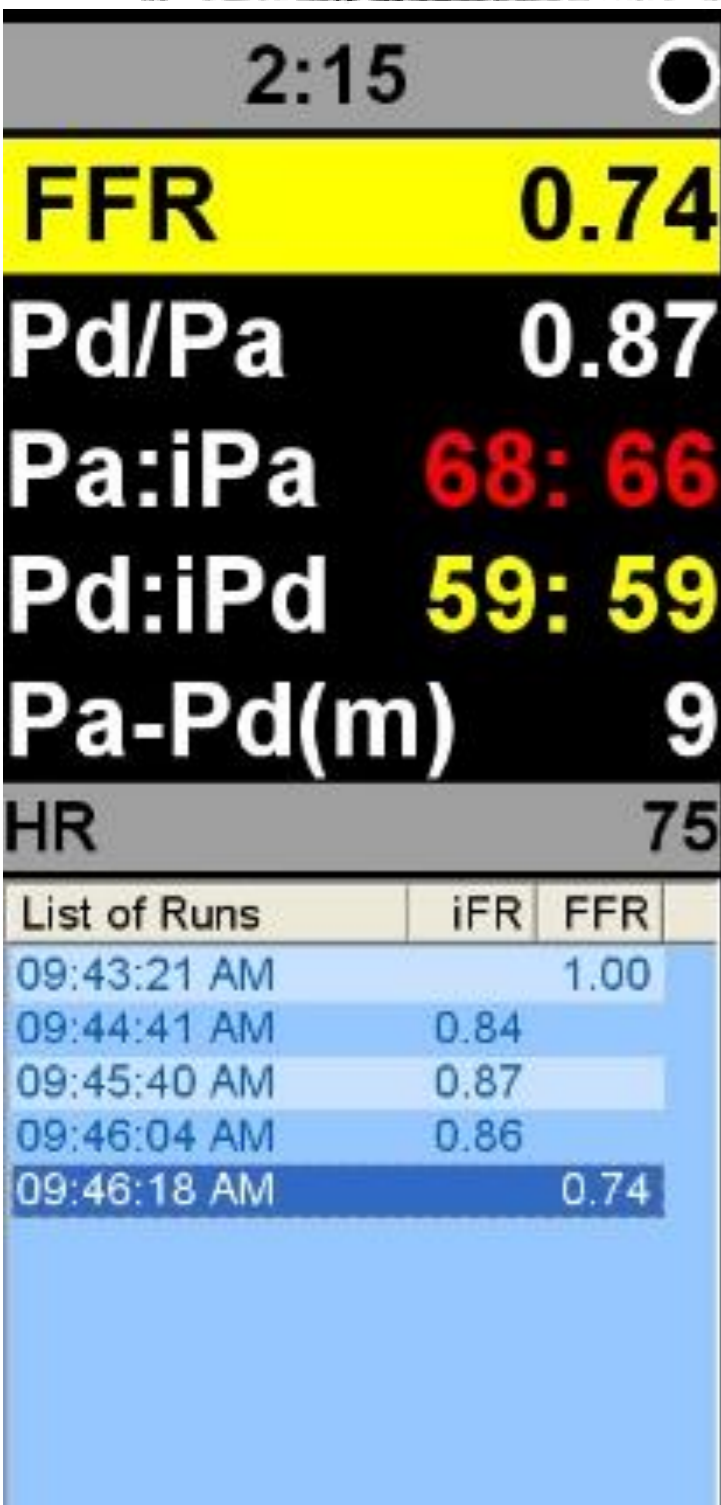
Pa-Pd(m) 23

HR 70

List of Runs	iFR	FFR
09:43:21 AM		1.00
09:44:41 AM	0.84	
09:45:40 AM	0.87	
Pre LCX Distal		
09:46:04 AM	0.86	
Post LCX Distal		
09:46:18 AM		0.82
Post LCX Distal		



As pressure dropped...



Repeat Pressure Normalization by i.a.-NE

2:34

FFR 0.74

Pd/Pa 0.76

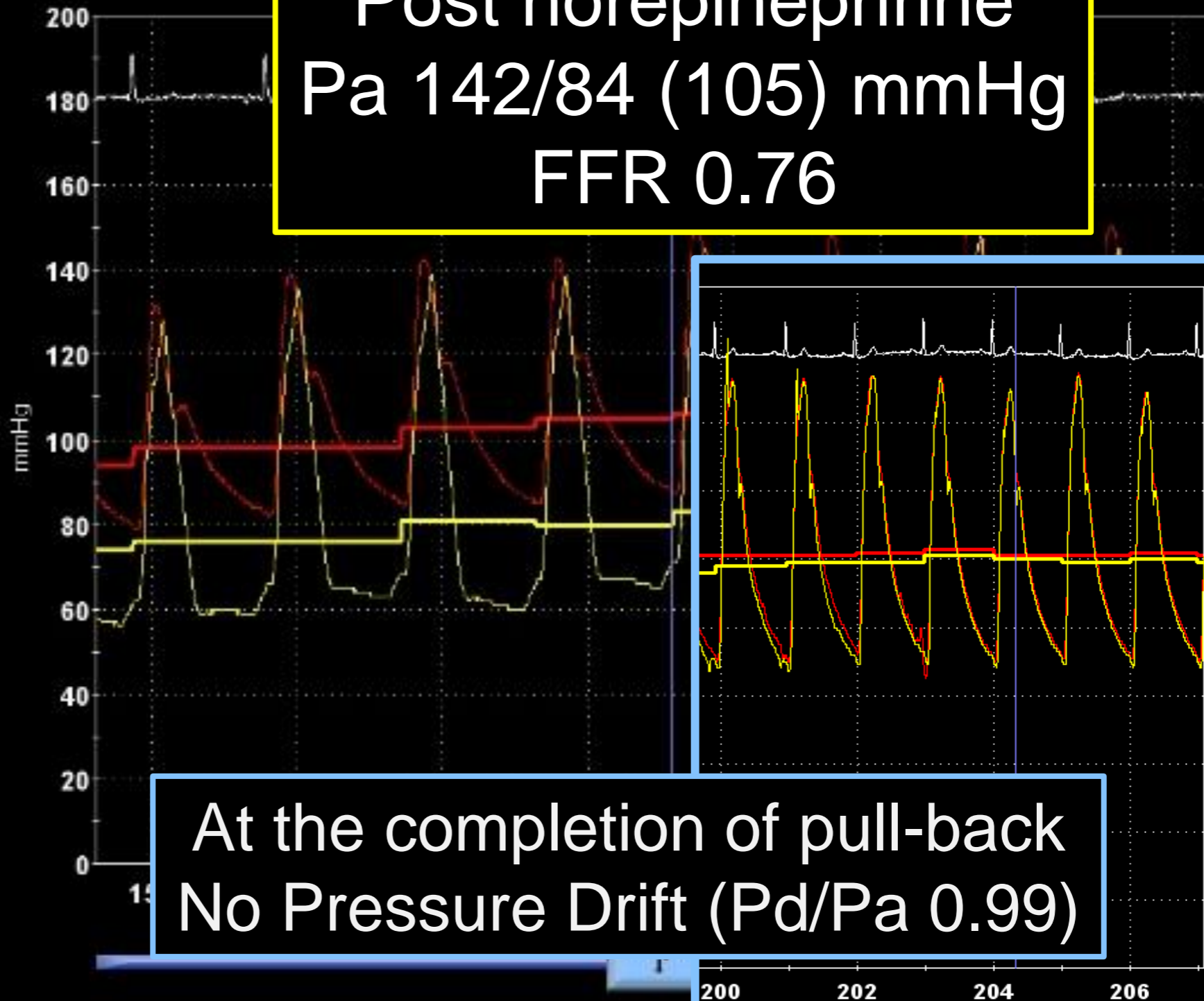
Pa:iPa 105:88

Pd:iPd 80:71

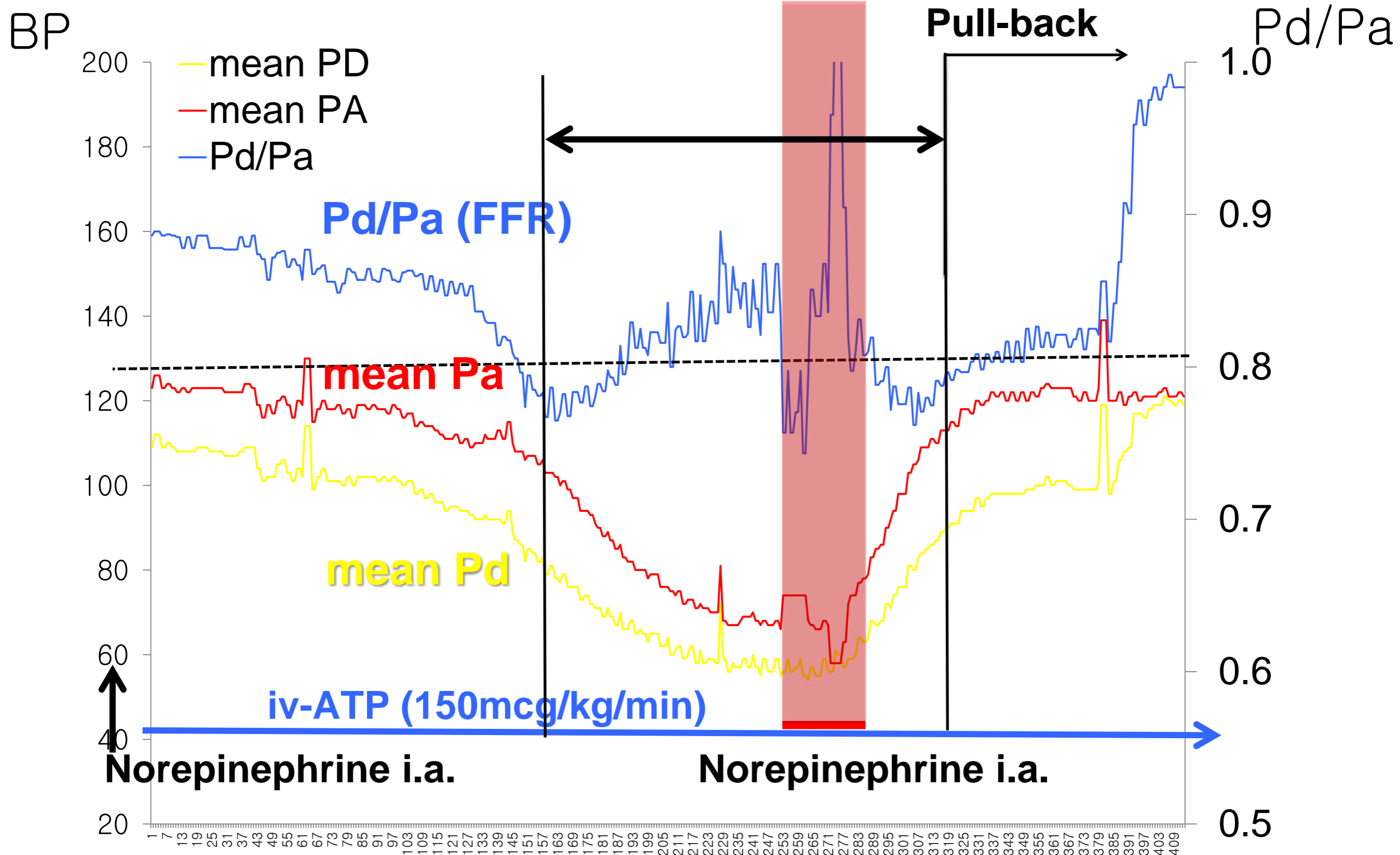
Pa-Pd(m) 25

HR 65

List of Runs	iFR	FFR
09:43:21 AM		1.00
09:44:41 AM	0.84	
09:45:40 AM	0.87	
09:46:04 AM	0.86	
09:46:18 AM		0.74

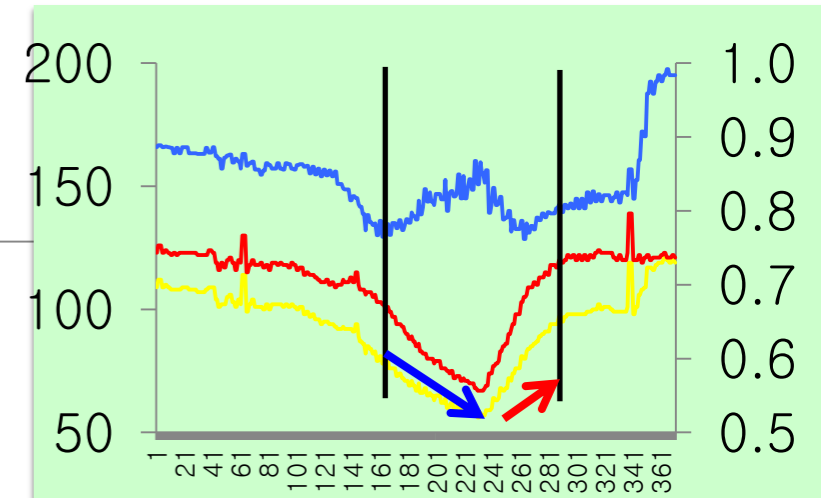
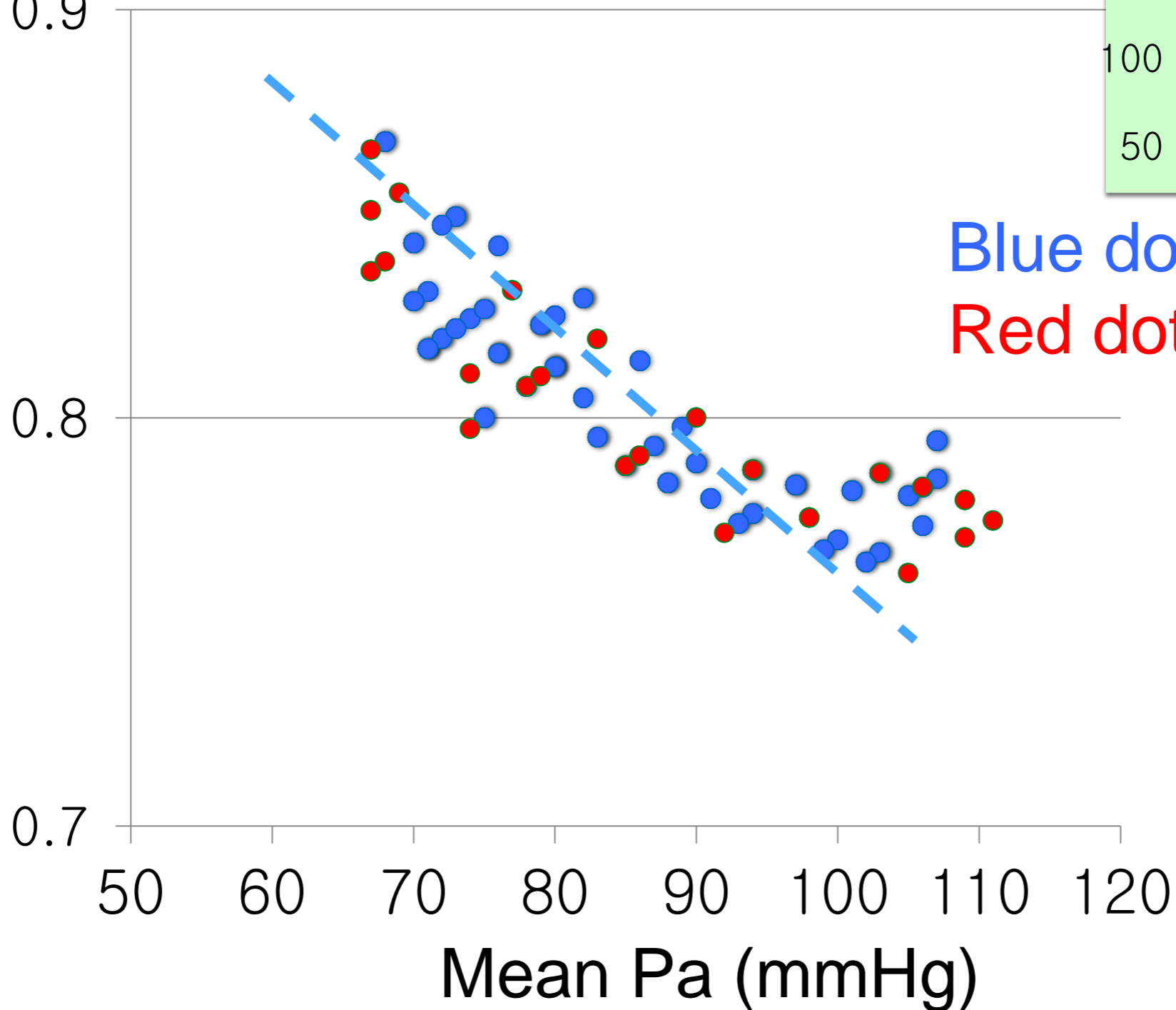


Pressure Tracing during Measurement



Relationship between Mean Pa and Pd/Pa

Pd/Pa
(FFR) 0.9



Blue dots: Descending
Red dots: Ascending

Adenosine-stress MPS (Tc tetrofosmin)

Stress

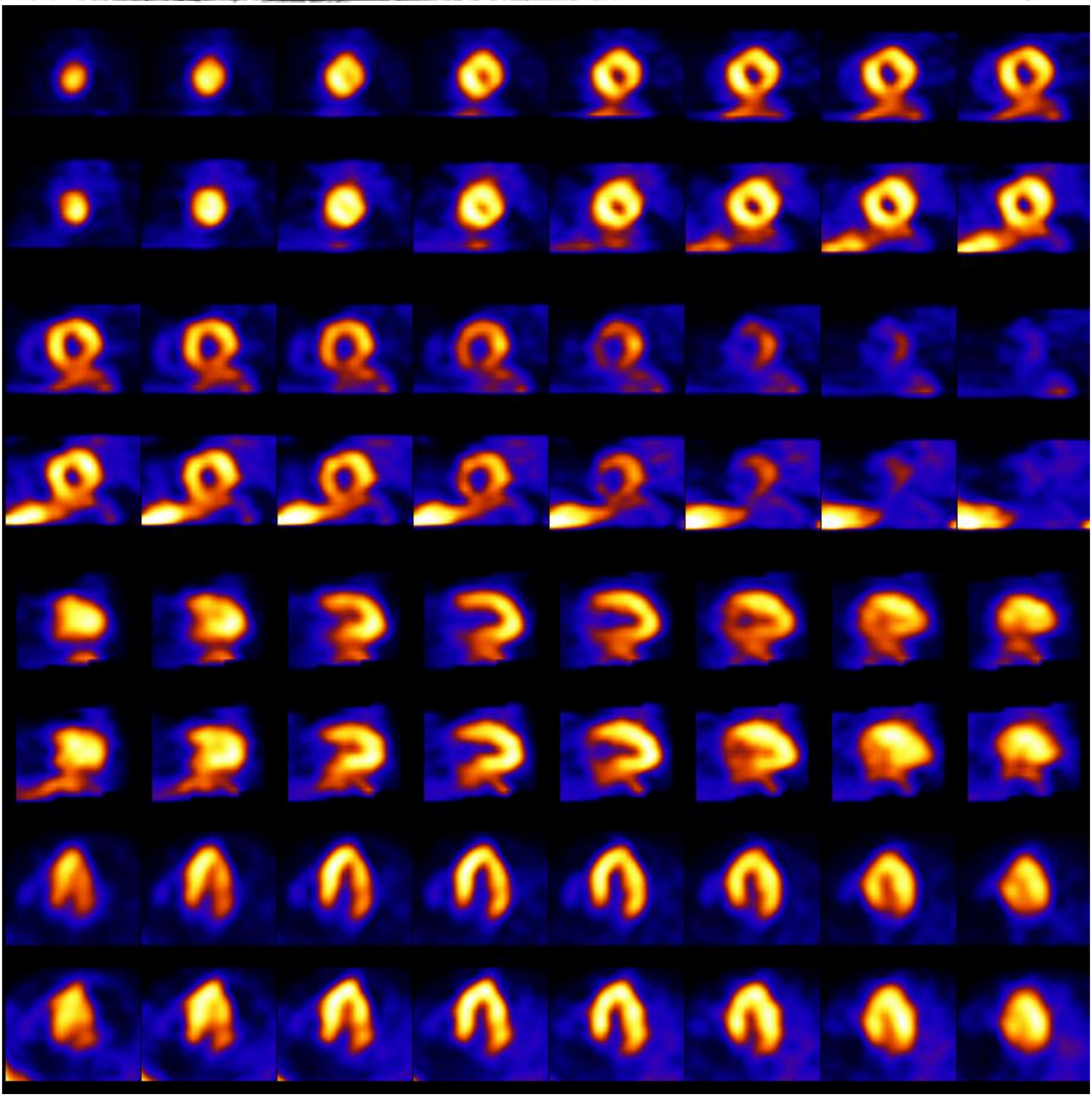
Rest

Stress

Rest

Stress

Rest



Discussion: why so pressure dependent?

- **Diabetic, ESKD on HD, moderate LVH.**
 - MV dysfunction, ↑zero-flow pressure (Pzf)
- **Microvasculature distal to the CTO**
 - Maximally vasodilated at rest.
 - Adenosine unlikely to increase, but might even decrease the flow (steal phenomenon)
- **Collateral channels may collapse during hypotension.**
 - Relative reduction of myocardial mass perfused.

Conclusions

- The present case demonstrated linear relationship between aortic pressure and FFR starting at relatively preserved aortic pressure.
This phenomenon was considered multifactorial.
- We might have missed minimum FFR without pressure normalization (before and/or during hyperemia).
- FFR was reproducible after pressure normalization and the initial minimum FFR was found to be the value to be accepted.