

PET

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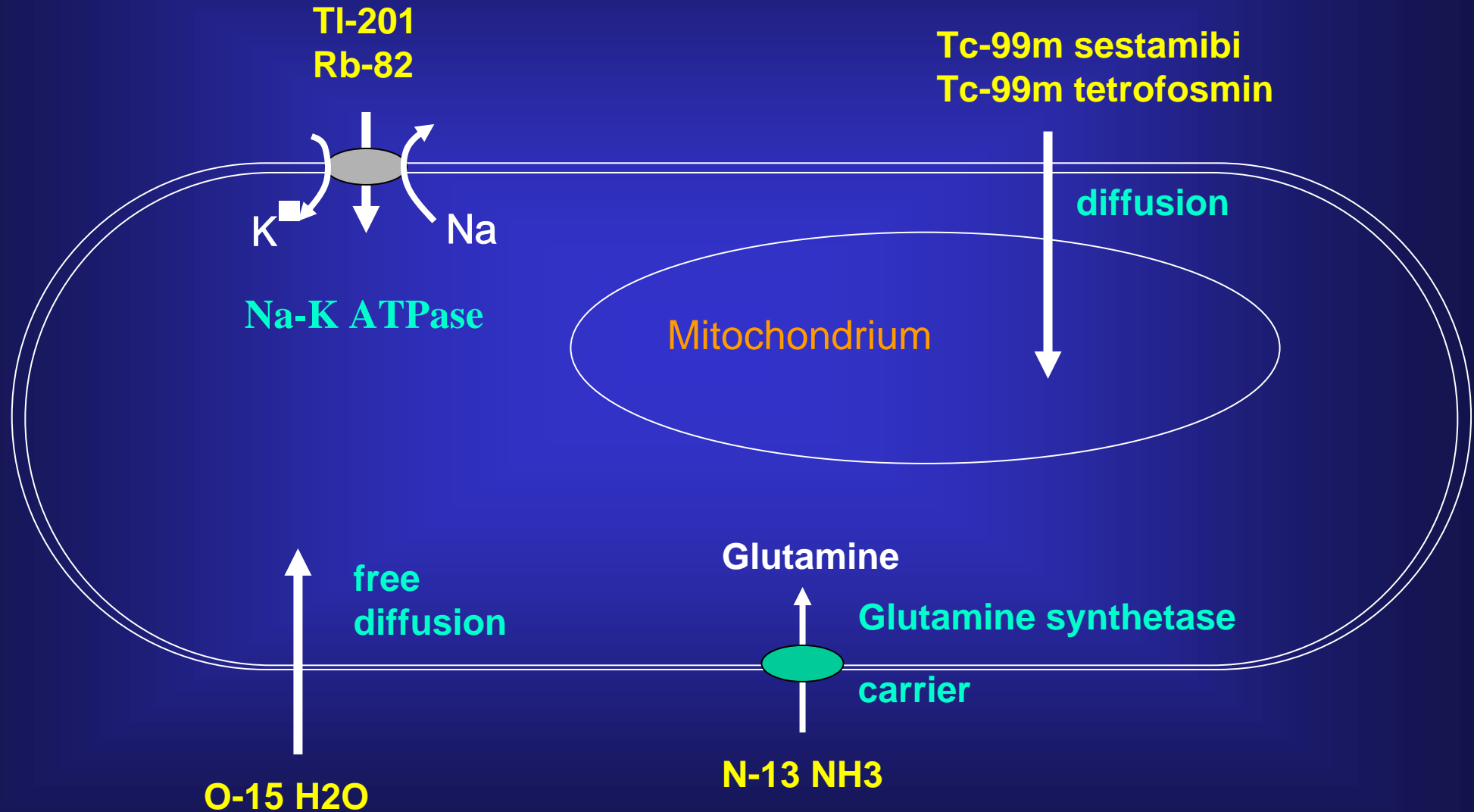


PET

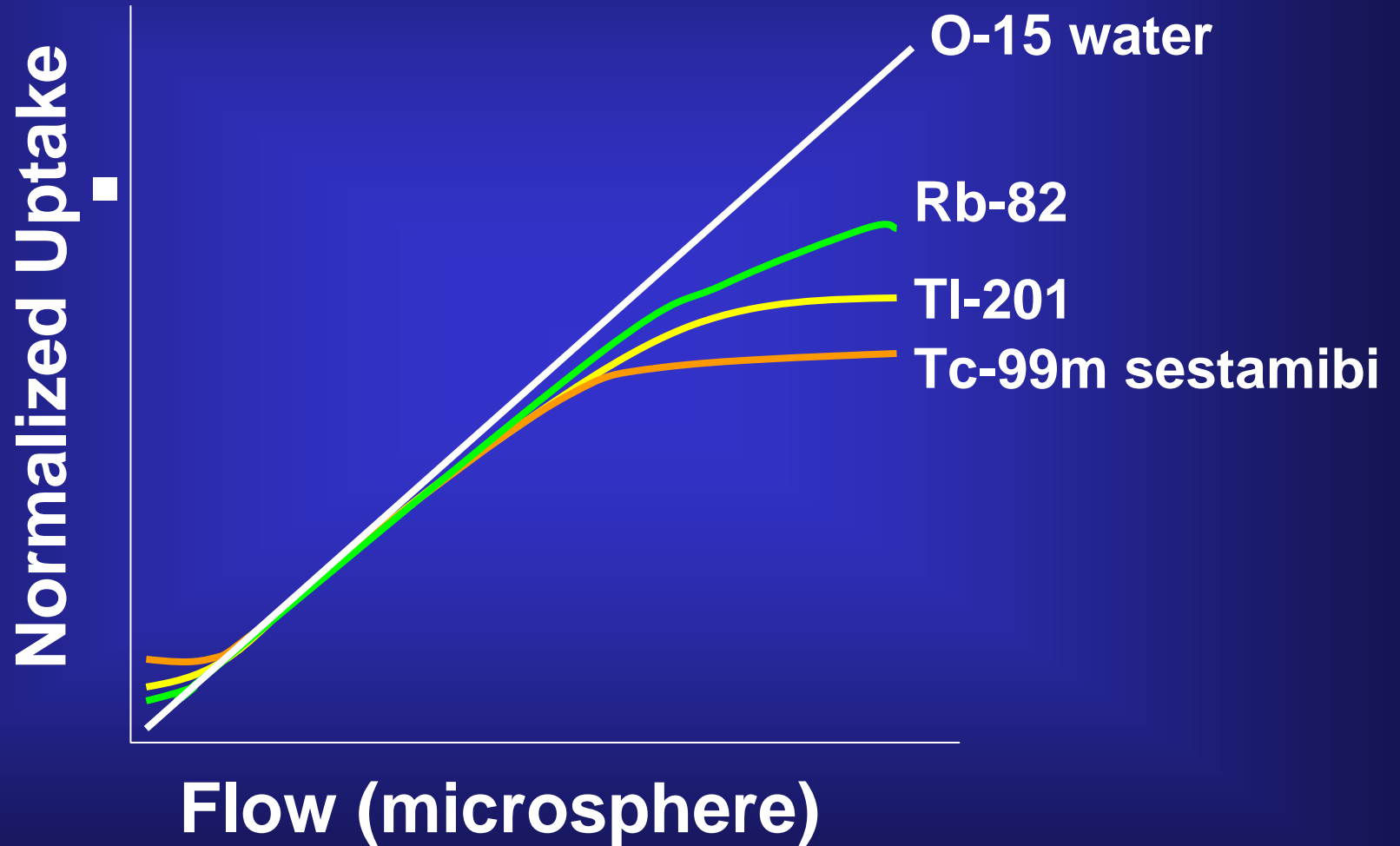


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Uptake of Flow Tracers



Uptake vs. Flow



Cardiac PET perfusion tracers

	N-13 ammonia	Rubidium-82	O-15 water
	10	78	2
(mm)	0.7	2.6	1.1
	cyclotron	generator	cyclotron
	80%	50-60%	~100%
(mCi)	20	60	60
(rem)	0.166	0.0962	0.252
	bladder	kidneys	heart
(rem)	0.52	1.98	0.49

N-13 Ammonia (NH₃)

- Neutral ammonia (NH₃) diffuses across plasma and cell membranes
- Trapped in glutamine via the enzyme glutamine synthase
- Allows good quality image
- Heterogeneity or mild defects in the lateral wall
- Degraded by occasional liver activity

Data Acquisition

Dynamic Gating
(6min) (13min)

19min

Scout + Injection

Waiting for bolus injection(15sec)

Break

60min

Stress Dynamic Gating
(6min) (+3min) (13min)

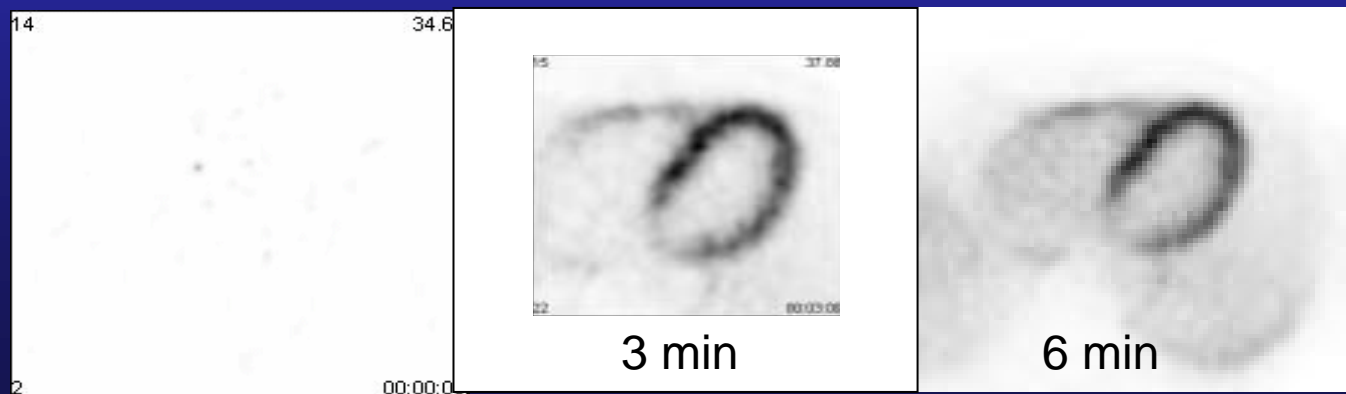
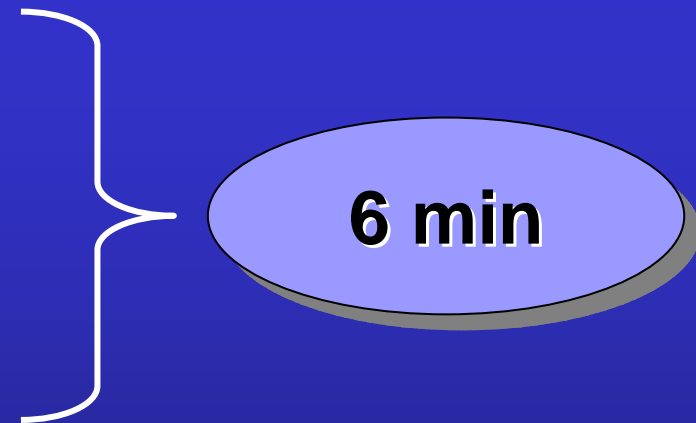
22min

Scout + Adenosine + Injection

injection(15sec) during stress

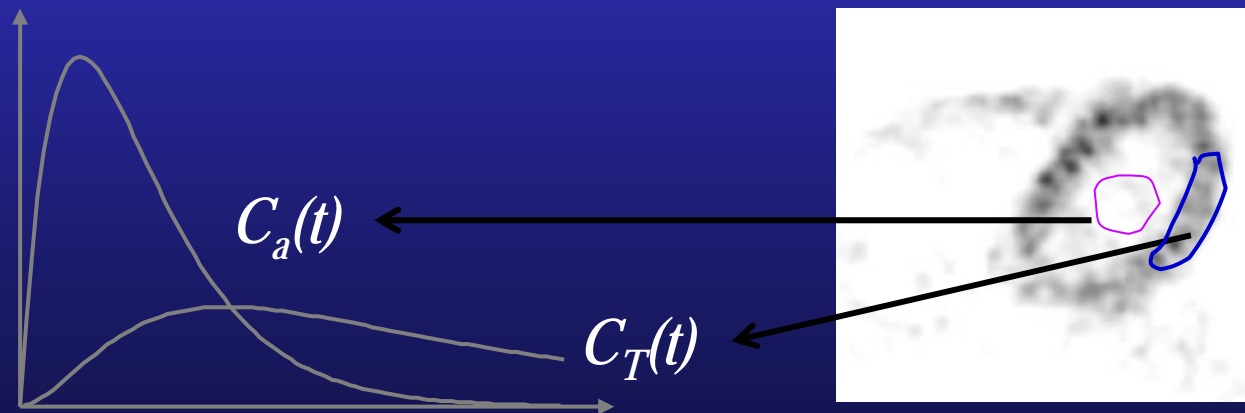
Dynamic Imaging Protocol

- 5 sec X 12 frames
- 10 sec X 6 frames
- 20 sec X 3 frames
- 30 sec X 6 frames

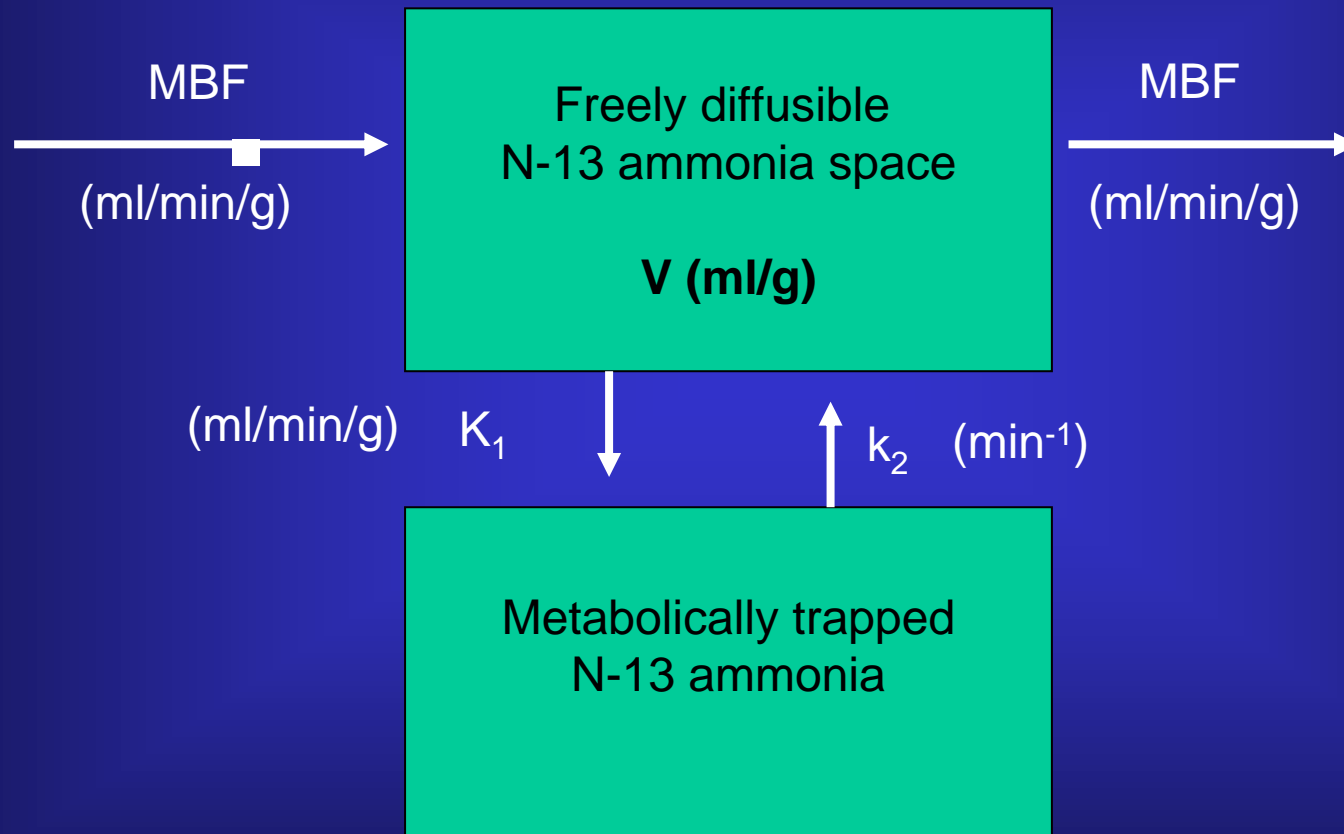


Measurement of Time-activity Curve

- Manual drawing region of interest (ROI) on image data
- Volume of interest (stack of ROIs on multiple slices)
- Template based ROI (VOI)

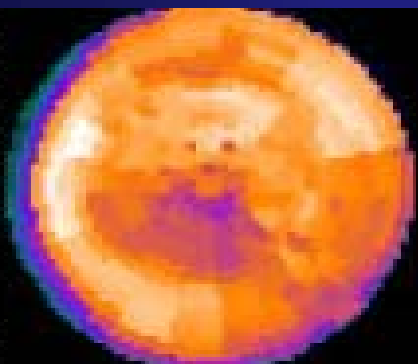


Two Compartment Model

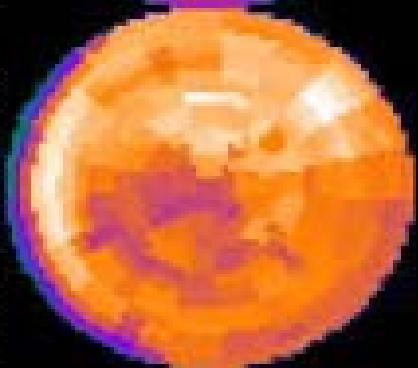


56/M CC: angina 2003: PCI/stent of p-LAD
2005: insignificant ISR m-LAD

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Adenosine



Rest

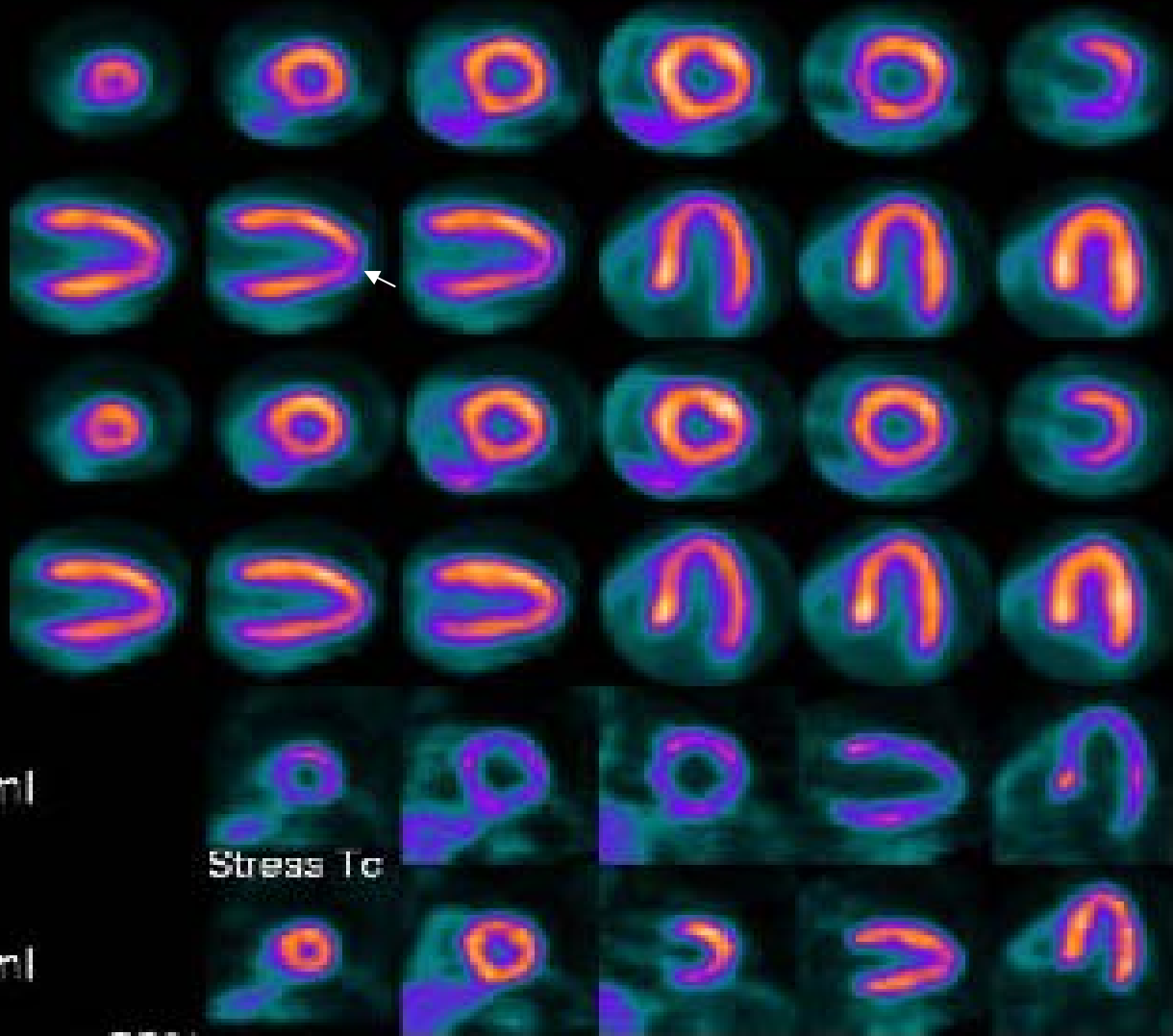


% Thickening

End Diastole
Volume = 85 ml

End Systole
Volume = 29 ml

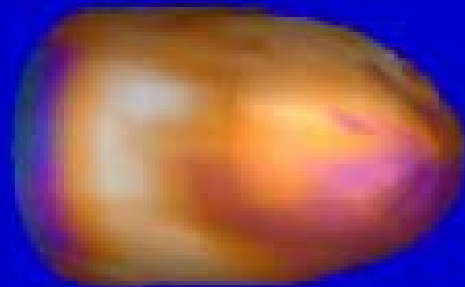
Ejection Fraction = 66% (RO)



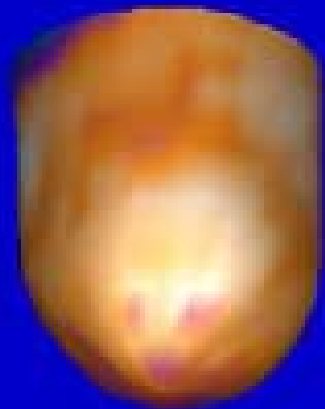
Stress To

Adenosine

Rest



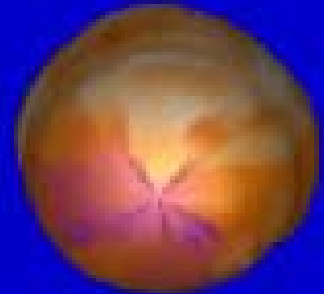
Septal



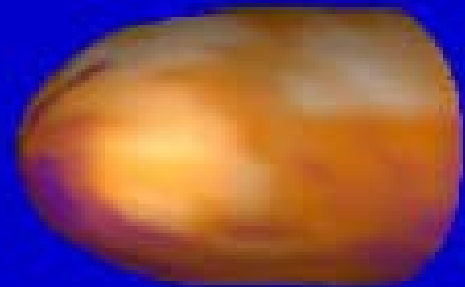
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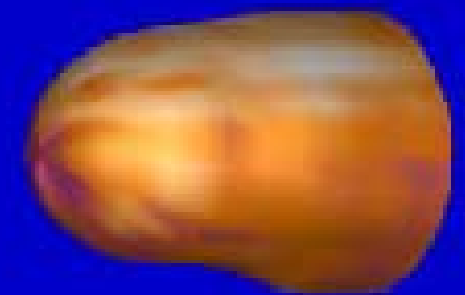
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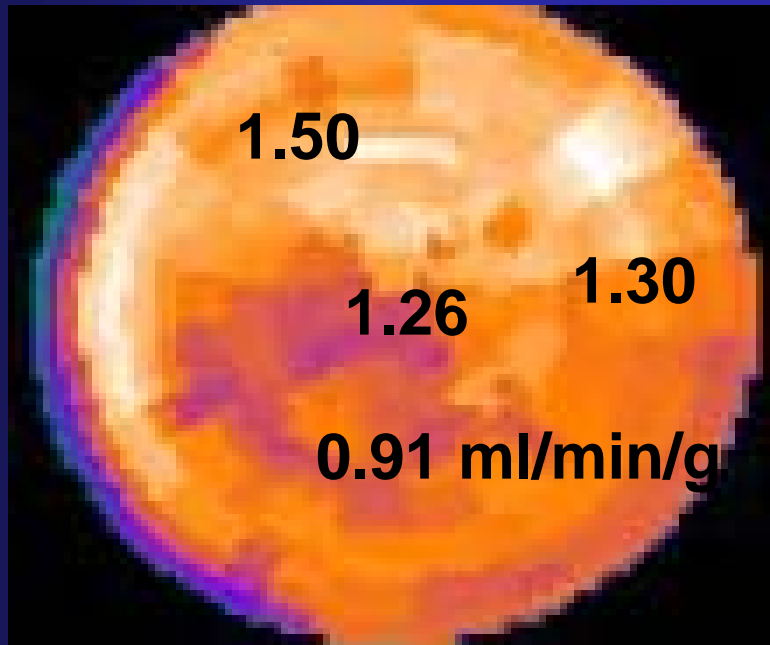
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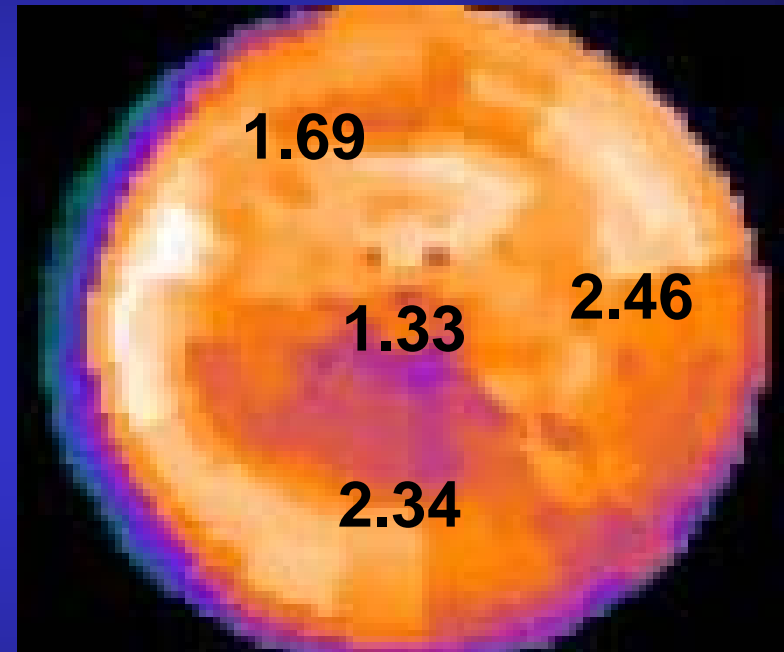
Lateral



MBF & CFR



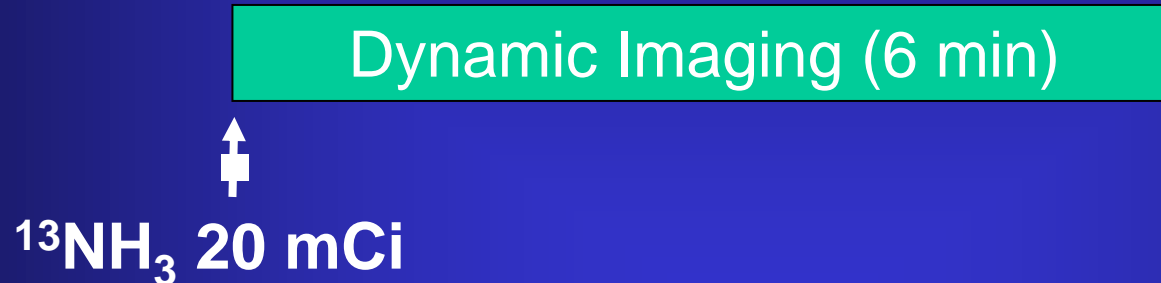
MBF-rest



CFR

Cold Pressor Test (CPT) : endothelial function test

At rest

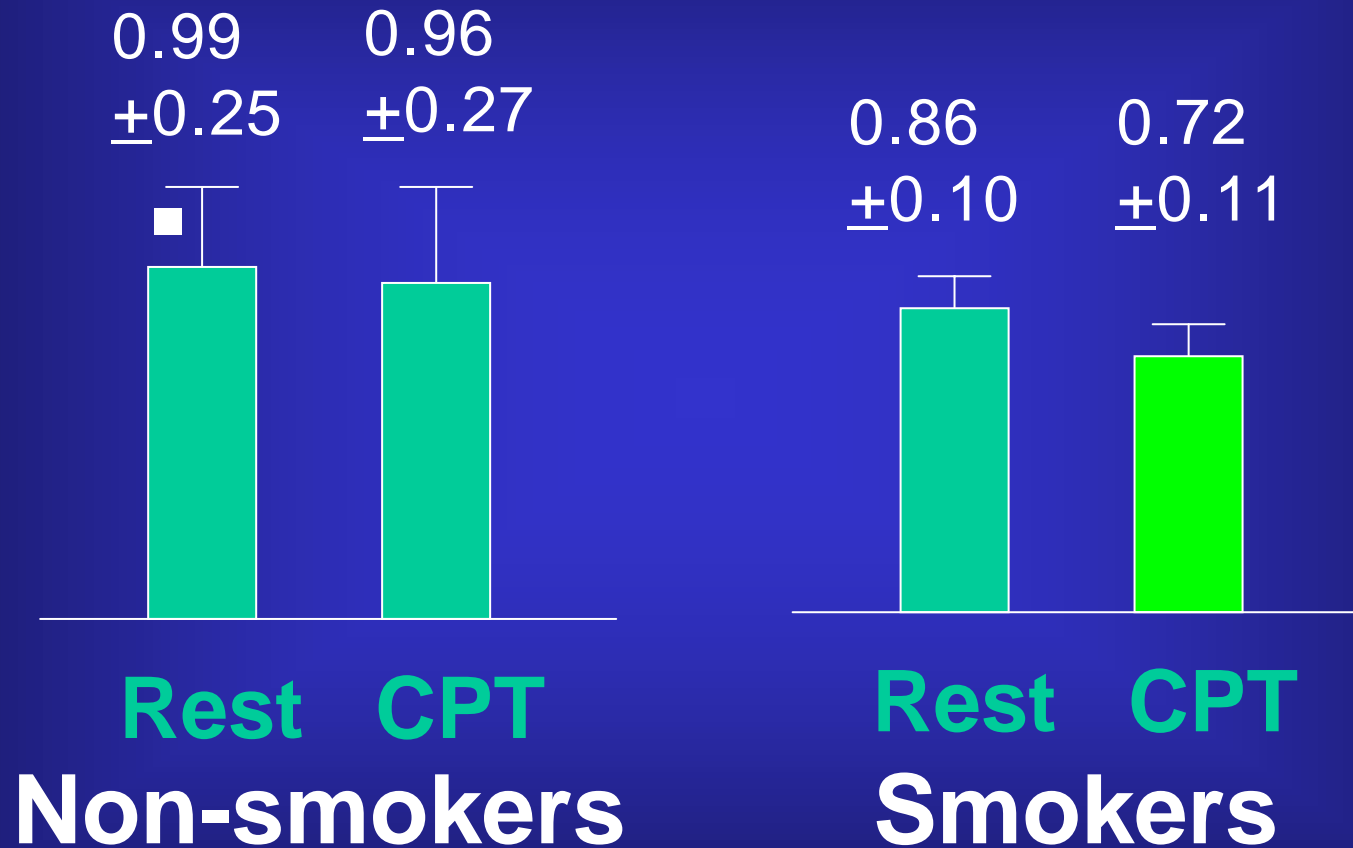


60 min Break

One Hand in Ice Water



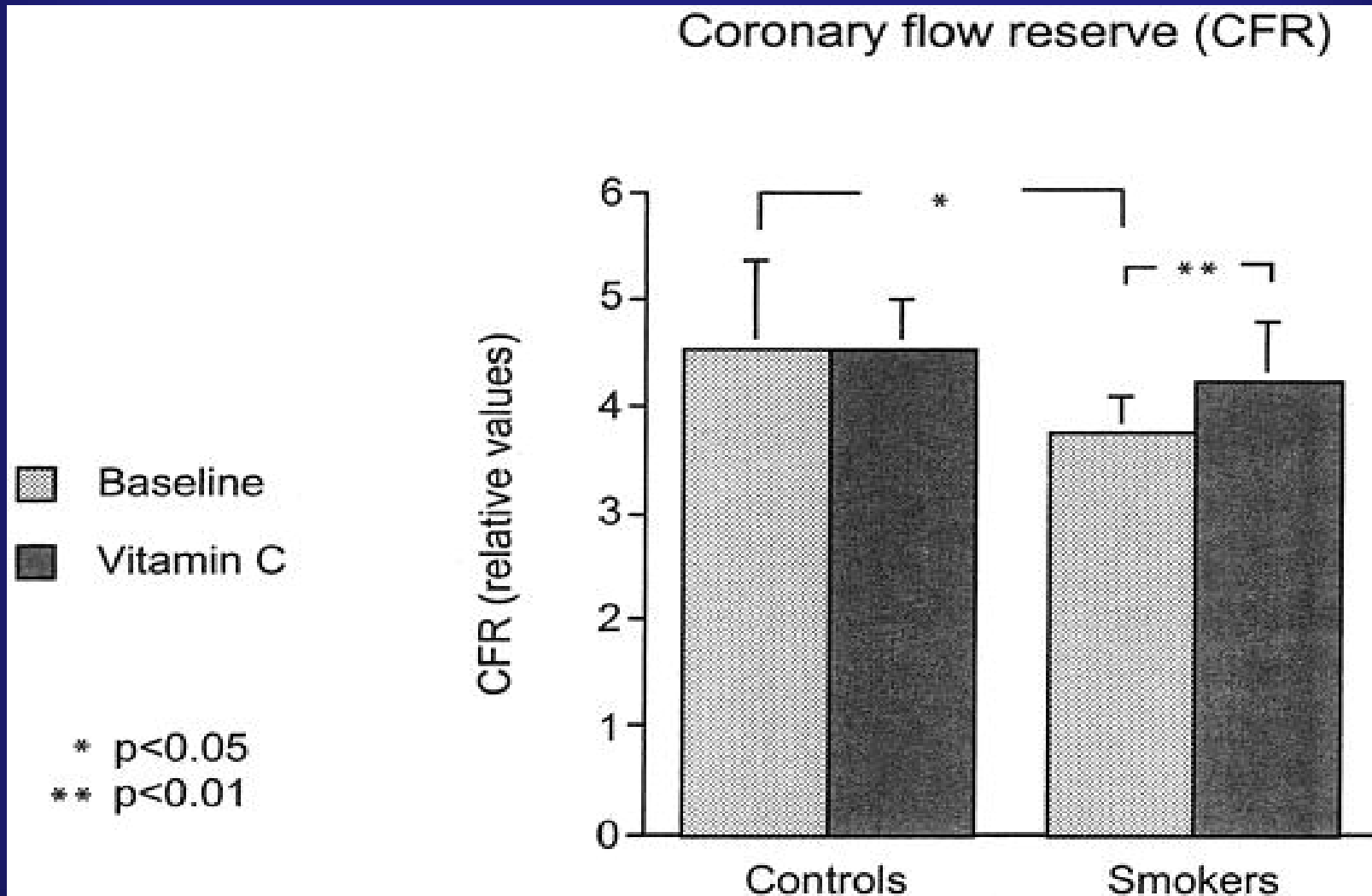
Abnormal Myocardial Blood Flow Response in Asymptomatic Smokers



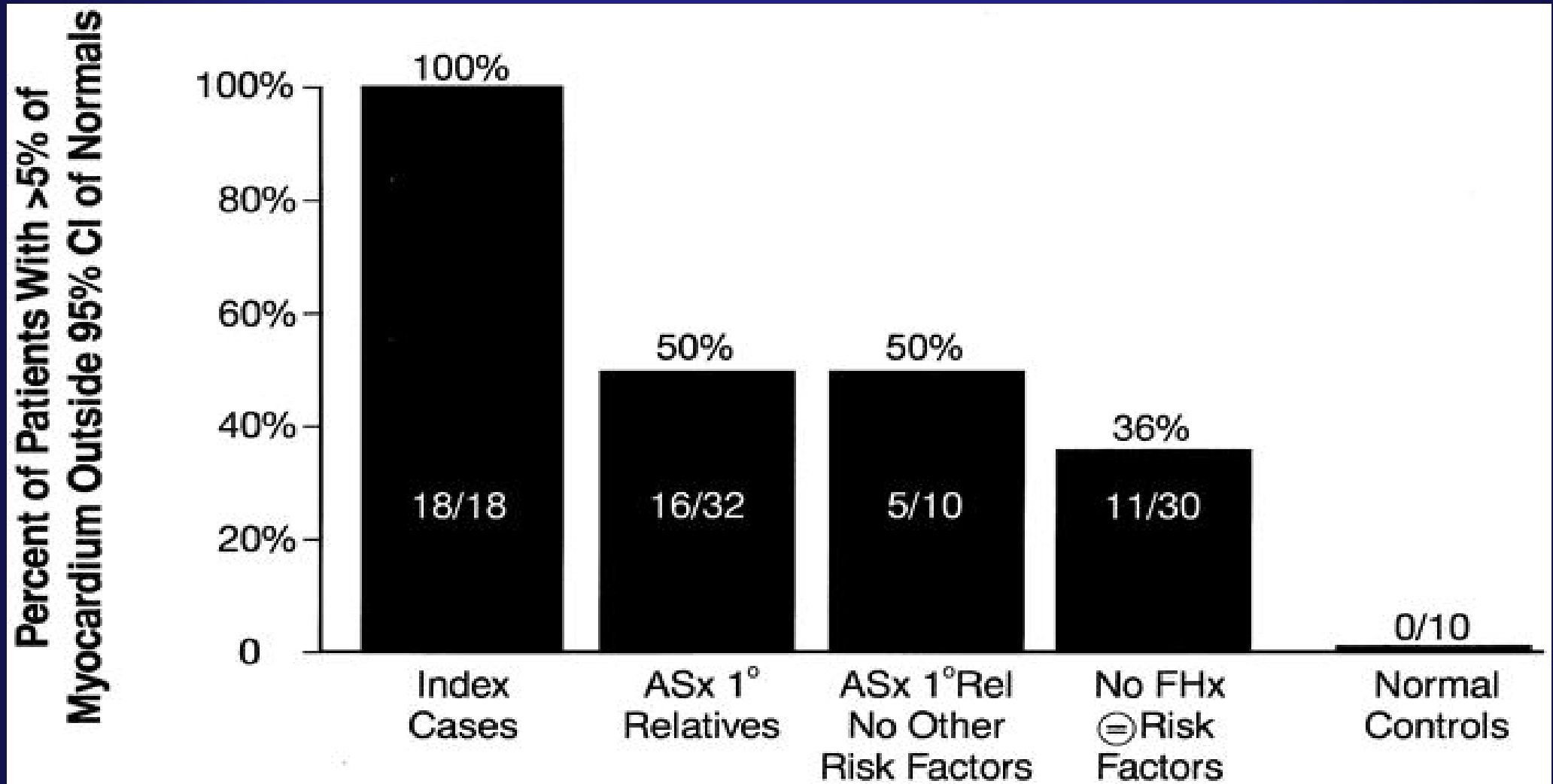
CPT: cold pressor test

*Campisi et al.
Circulation, 1998*

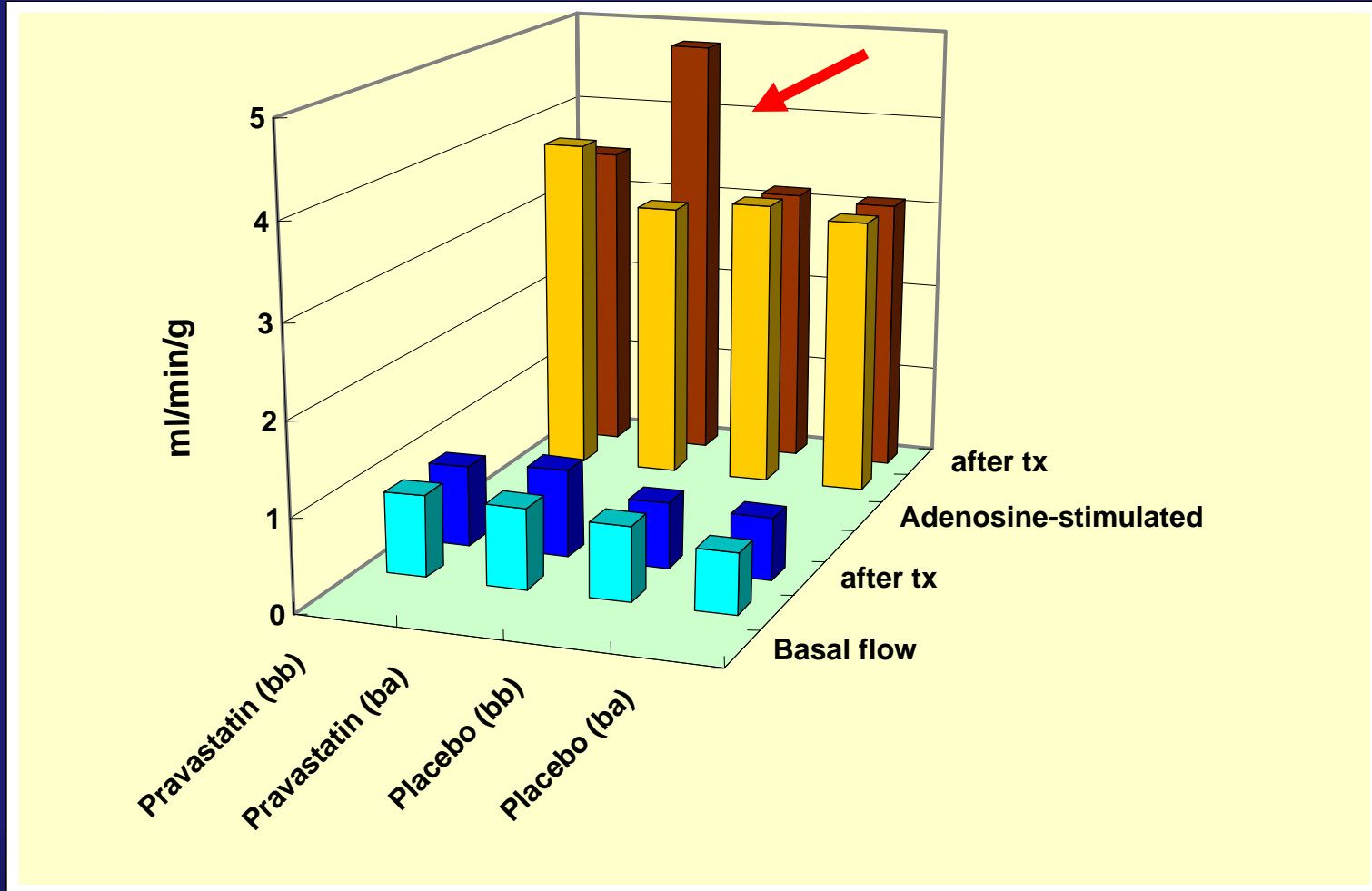
Vitamin C Restores Coronary Microcirculatory Function in Smokers



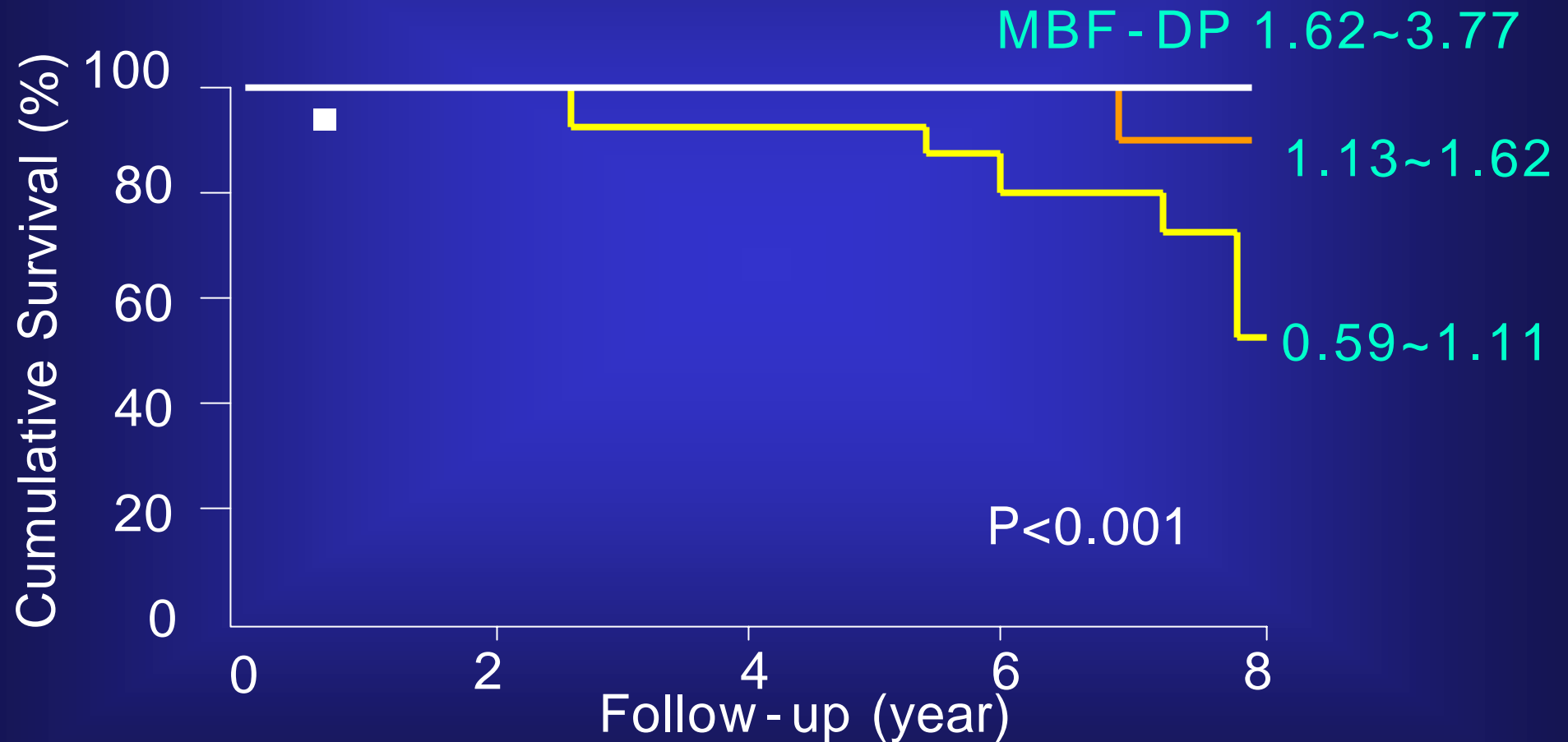
High Prevalence of Myocardial Perfusion Abnormalities on Positron Emission Tomography in Asymptomatic Persons With a Parent or Sibling with Coronary Artery Disease



eNOS genotype modulates the improvement of coronary blood flow by pravastatin: a placebo-controlled water PET study

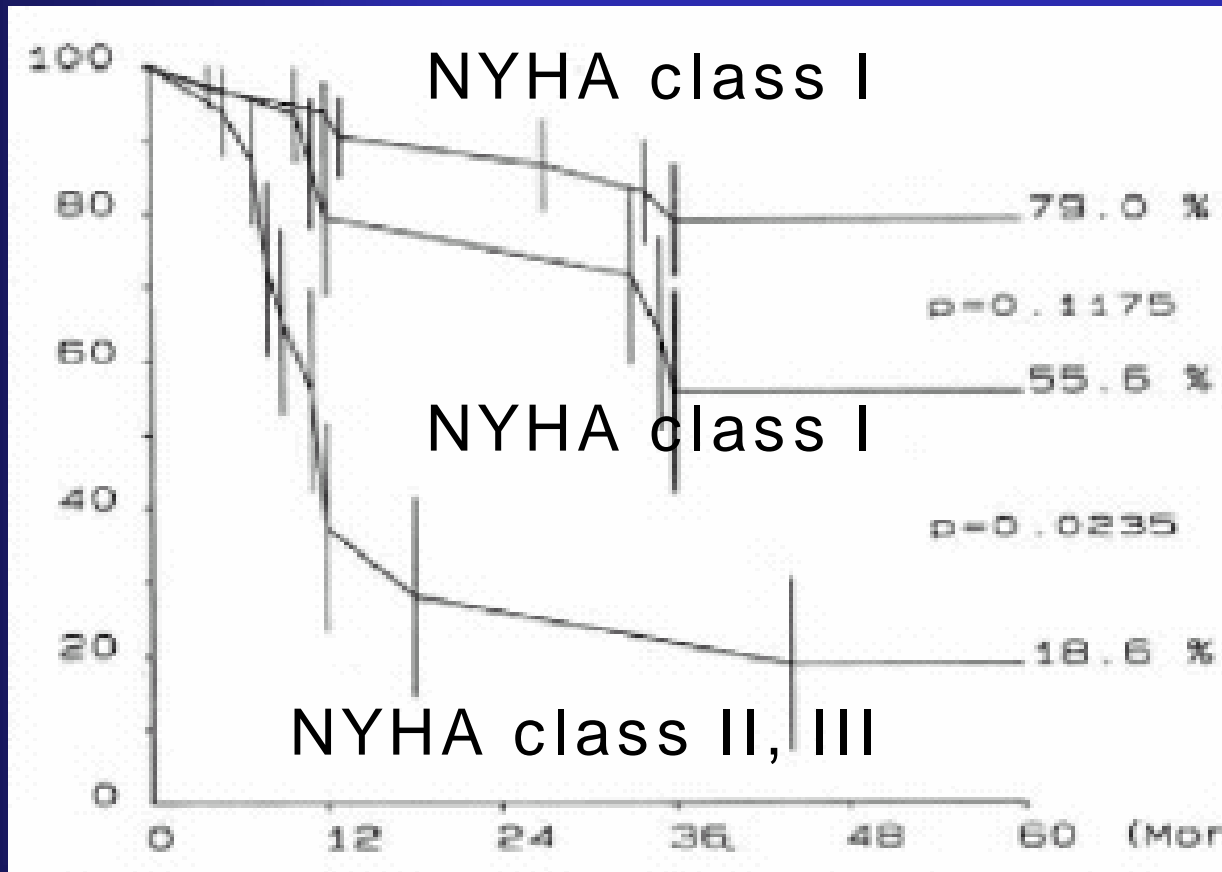


Myocardial Blood Flow after Dipyridamole vs. Prognosis in patients with Hypertrophic Cardiomyopathy



Cecchi et al. N Engl J Med, 2003

Myocardial Blood Flow after Dipyridamole vs. Prognosis in patients with Dilated Cardiomyopathy



MBF-DP

>1.36 ml/min/g

≤1.36 ml/min/g

≤1.36 ml/min/g

MBF & CFR

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1st Announcement

WFNMB 2006

Seoul, Korea

2006.10.22 - 27.
KOEX

The 9th Congress of
the World Federation of
Nuclear Medicine & Biology in 2006

October 22~27, 2006
www.wfnmb.org

**Nuclear Cardiology
Programs include**

- PET/CT
- SPECT/CT
- Molecular Imaging
- Correlative Imaging
- Pharmacologic Stress
- Read with Experts

