

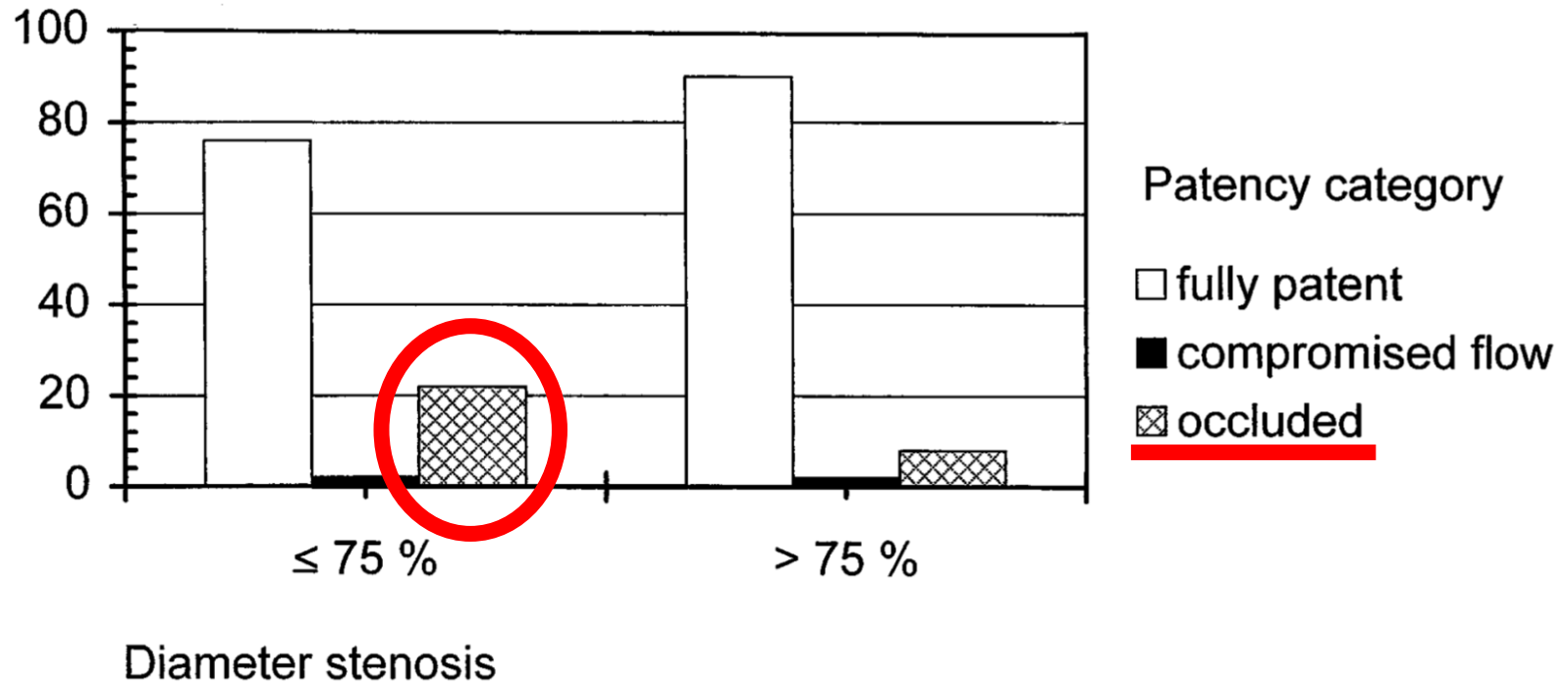
La valutazione funzionale in quadri anatomici particolari
Paziente candidato a CABG

Fabio Mangiacapra, MD, PhD, FESC
Campus Bio-Medico University, Rome

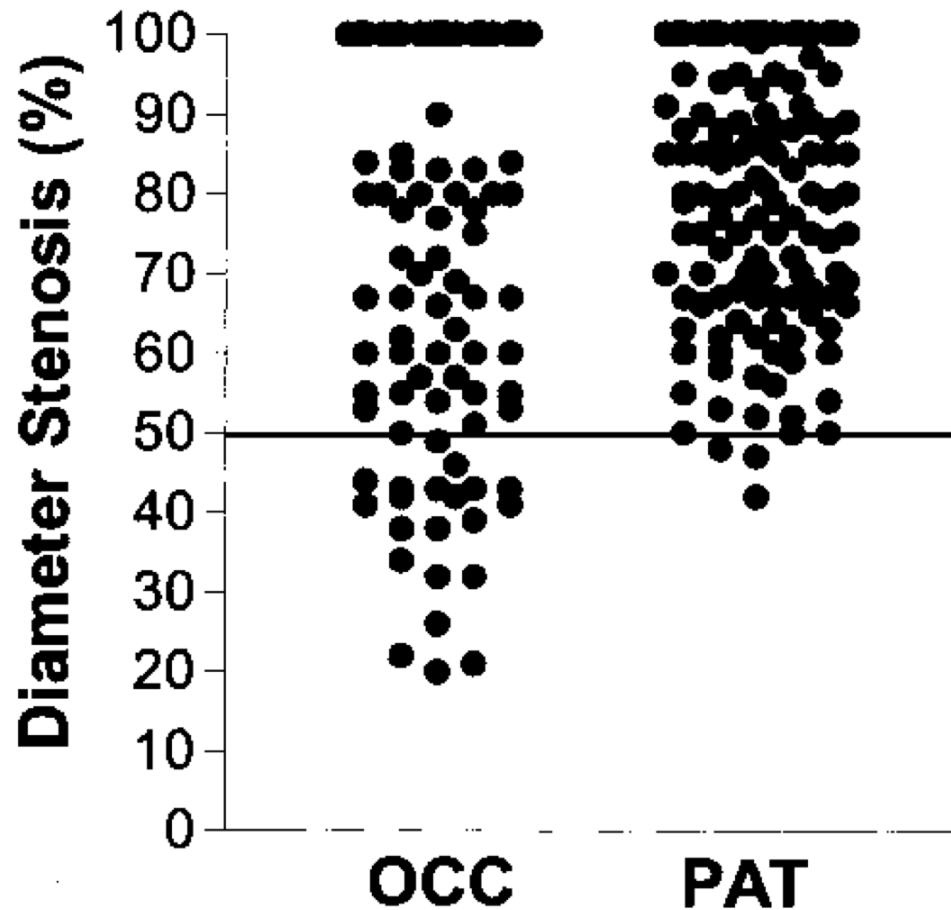
Question #1

**Why do we need an accurate assessment of lesion severity
before CABG?**

Graft patency



Graft patency



**DS <50% predicts IMA occlusion
(OR 21.5 [5.2-64.4])**

Atherosclerosis progression

Segment	Percentage of Lesions Progressed	Progression to Occlusion
Bypassed	39.6% (156/394)	46.8% (73/156)
Proximal to the graft	33.1% (54/163)	22.2% (12/54)
Nonbypassed	20.2% (44/218) ^a	20.4% (9/44)

Stenosis Location	Percentage of Lesions Progressed		<i>p</i> Value	Odds Ratio (95% CL)
	Arterial Grafts	Venous Grafts		
Bypassed segment	32.6% (62/190)	46.1% (94/204)	0.001	2.03 (1.31, 3.13)
More proximal segment	25.6% (24/94)	44.9% (31/61)	0.008	2.90 (1.32, 6.36)

Question #1

**Why do we need an accurate assessment of lesion severity
before CABG?**



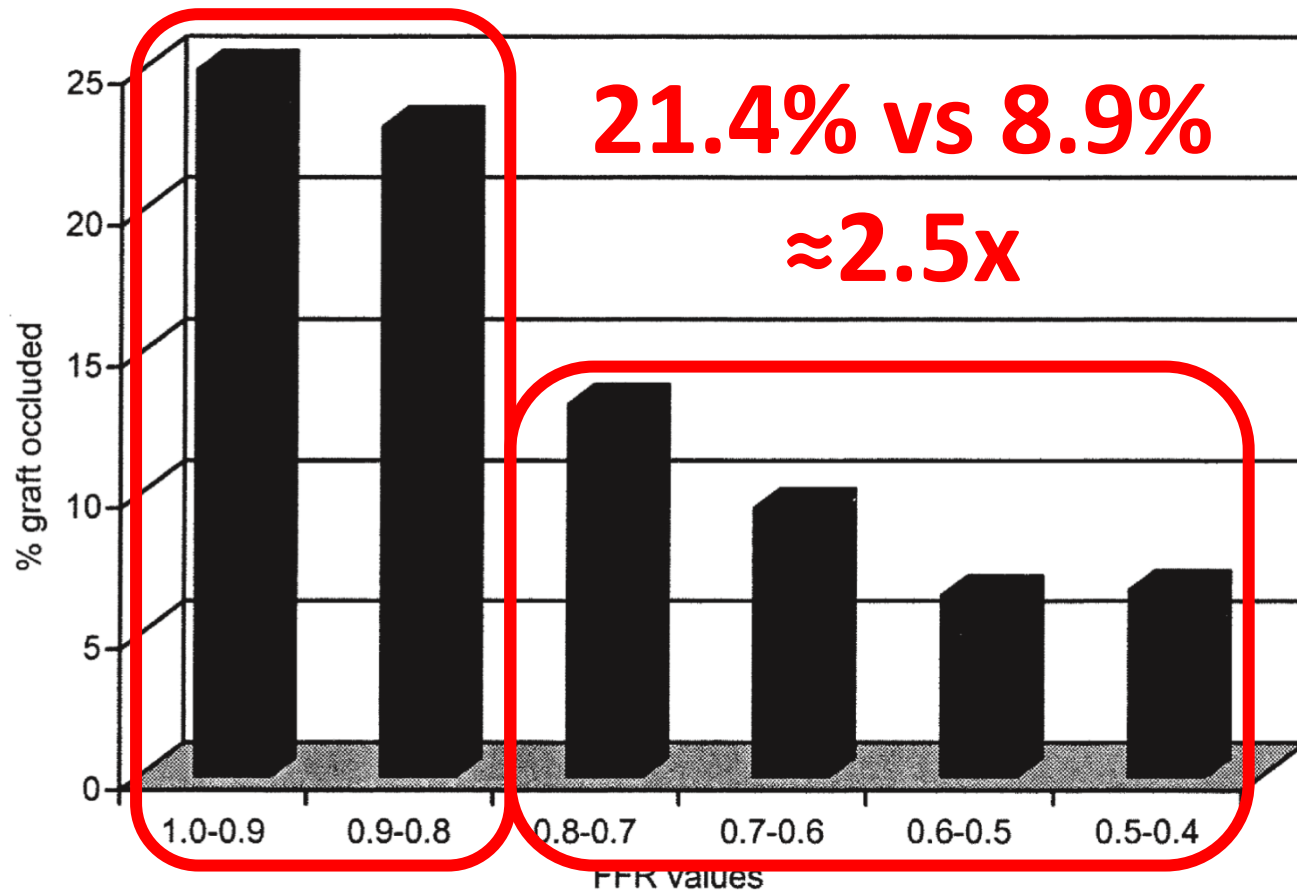
- *Grafting less severely diseased vessels is associated with an increased risk of graft failure*
- *Useless grafts are not costless!*

Question #2

Can FFR predict graft performance?

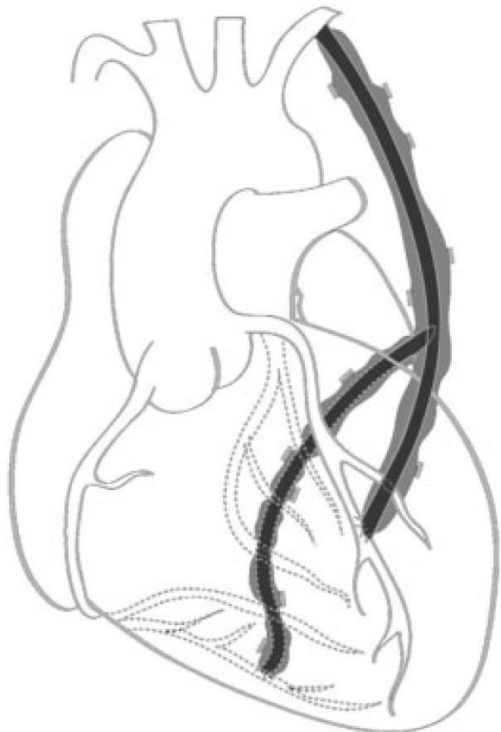
Functional stenosis severity and graft failure

164 patients - FFR measure in all vessels to be grafted - 1-year FUP

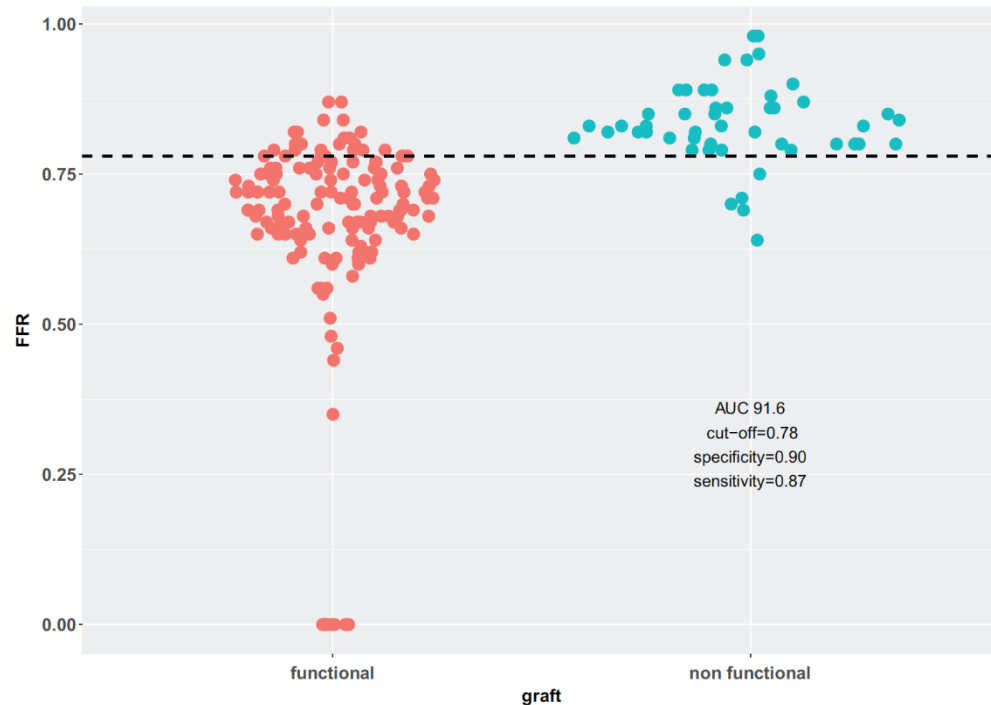


Functional stenosis severity and graft failure

IMPAG - 199 lesions with FFR measured before grafting (arterial only)
6-month FUP



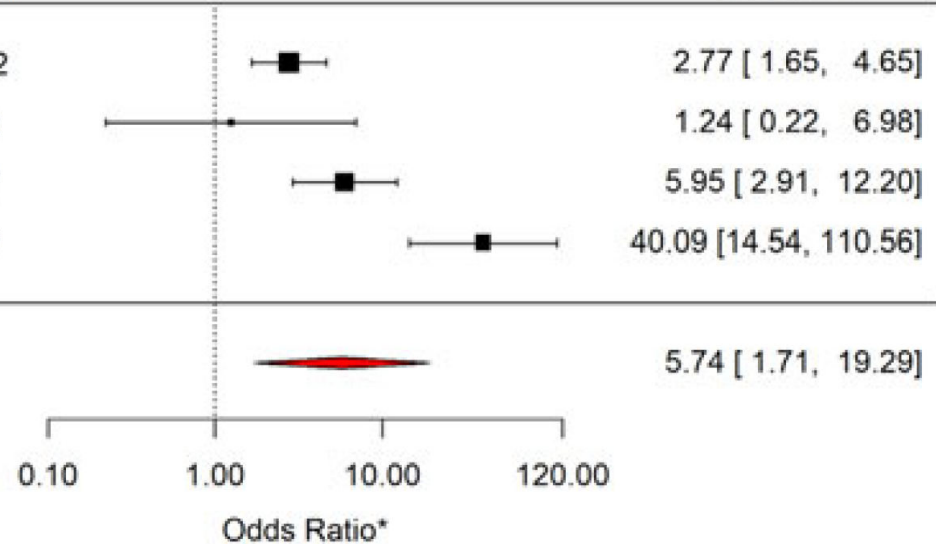
Preop FFR cut
off of 0,78 for
functional
arterial
anastomosis



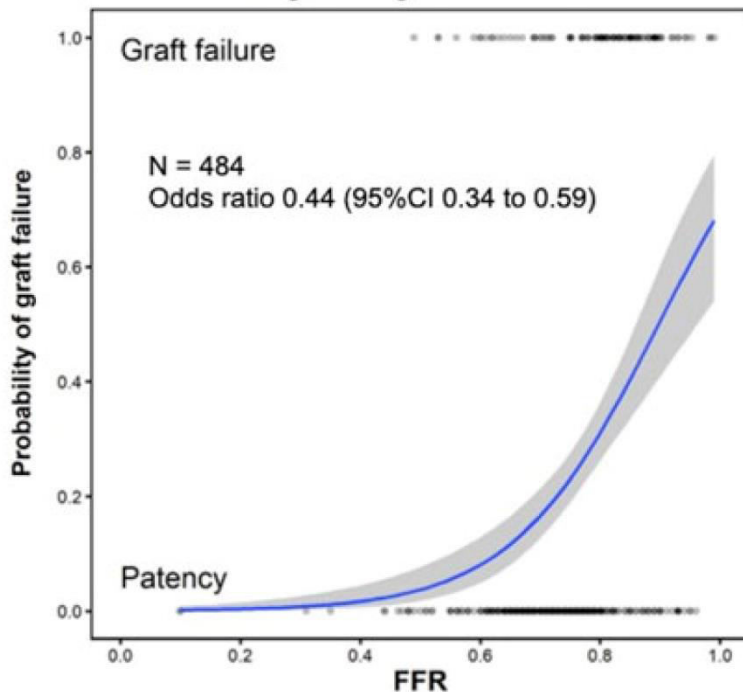
Anastomoses to coronary arteries with FFR <0.78 had a patency rate of 97%

Functional stenosis severity and graft failure

	Abnormal FFR		Preserved FFR		OR [95%CI]
	Graft Failure	Graft Patent	Graft Failure	Graft Patent	
Botman et al.	32	325	36	132	2.77 [1.65, 4.65]
FARGO	5	56	2	18	1.24 [0.22, 6.98]
GRAFFITI	37	156	24	17	5.95 [2.91, 12.20]
IMPAG	5	123	44	27	40.09 [14.54, 110.56]



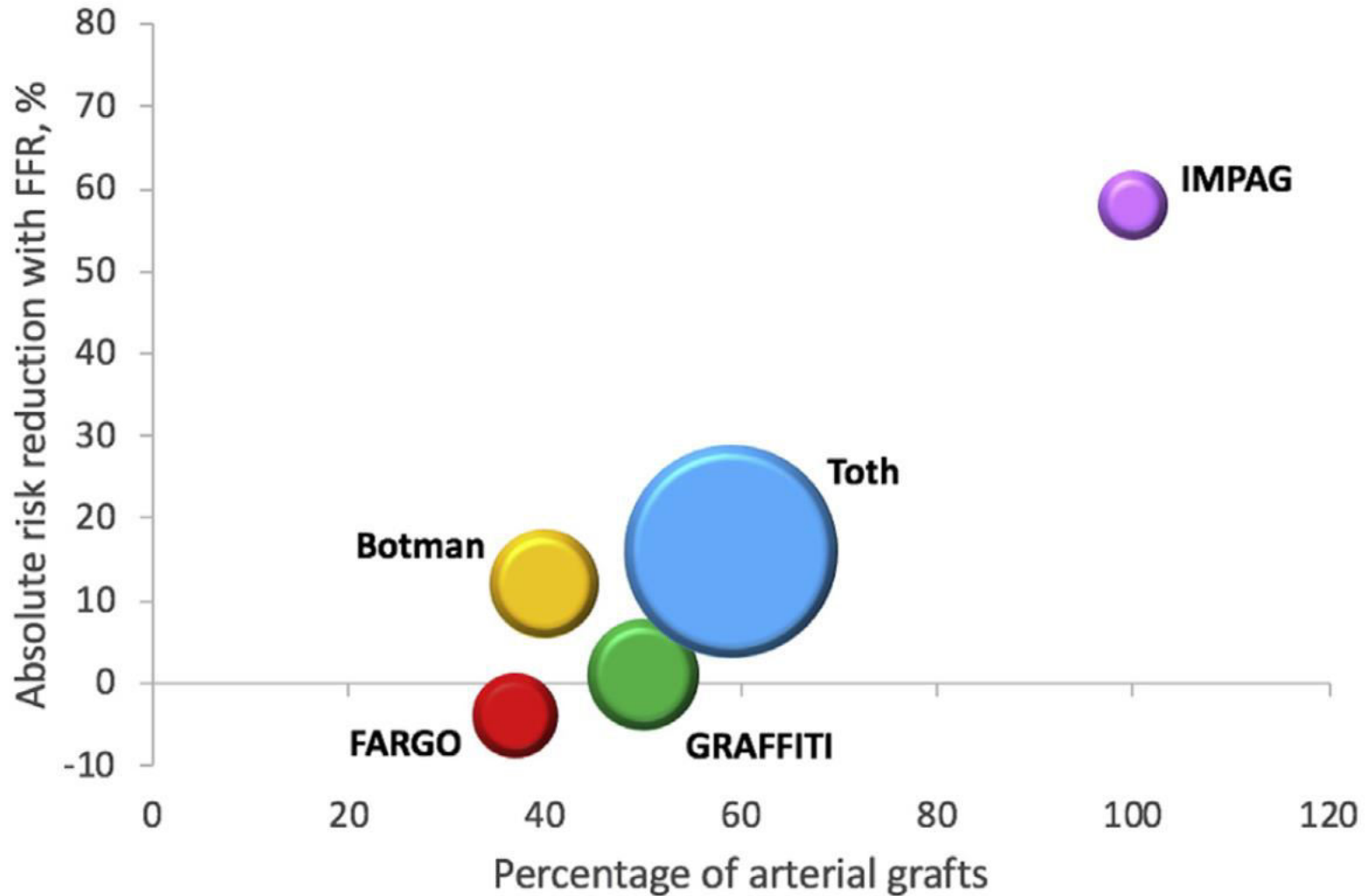
Logistic Regression Model



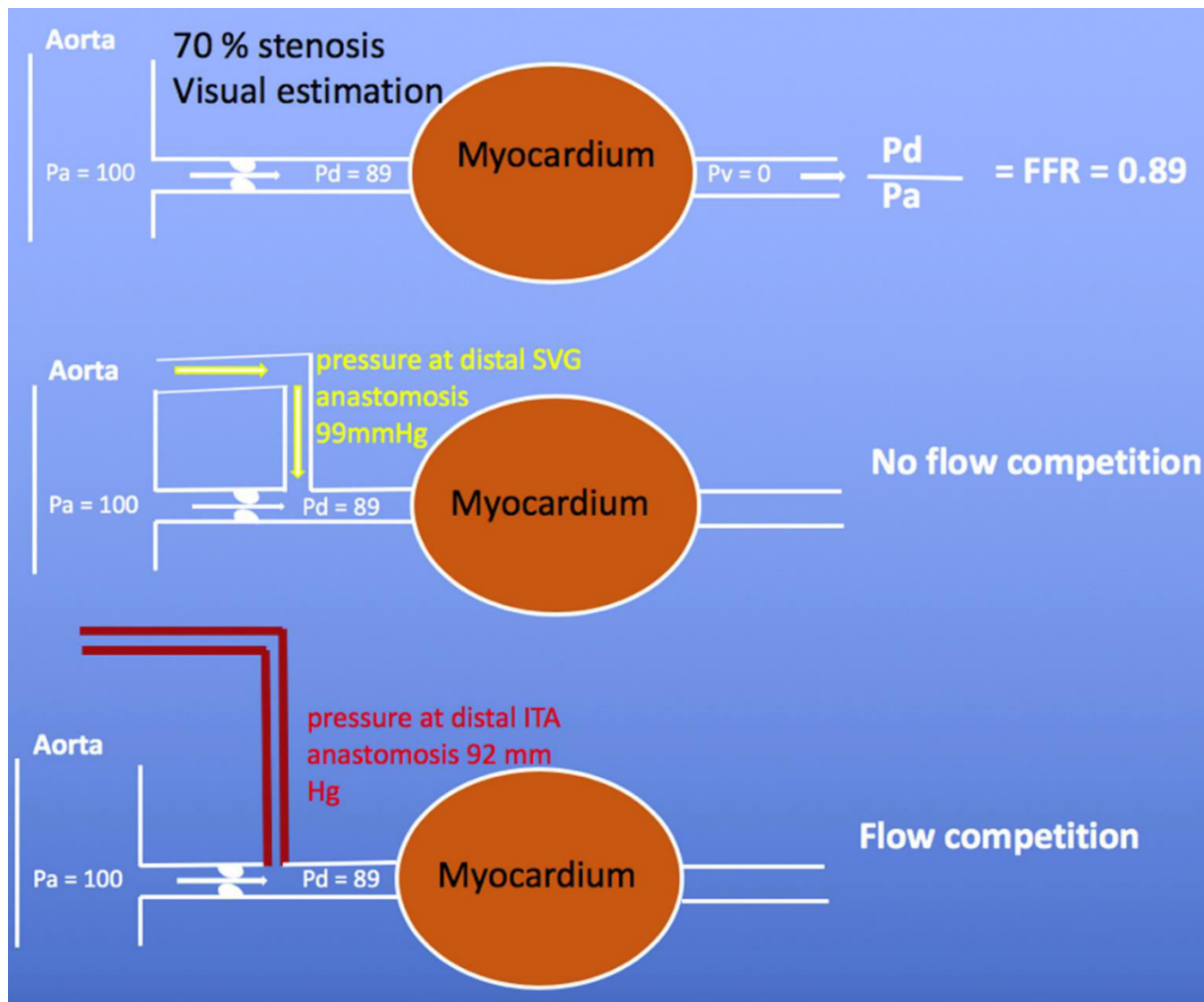
FFR cut-off to predict graft failure was 0.79

Functional stenosis severity and graft failure

The impact of graft type



Flow competition: veins vs arteries



Question #2

Can FFR predict graft performance?

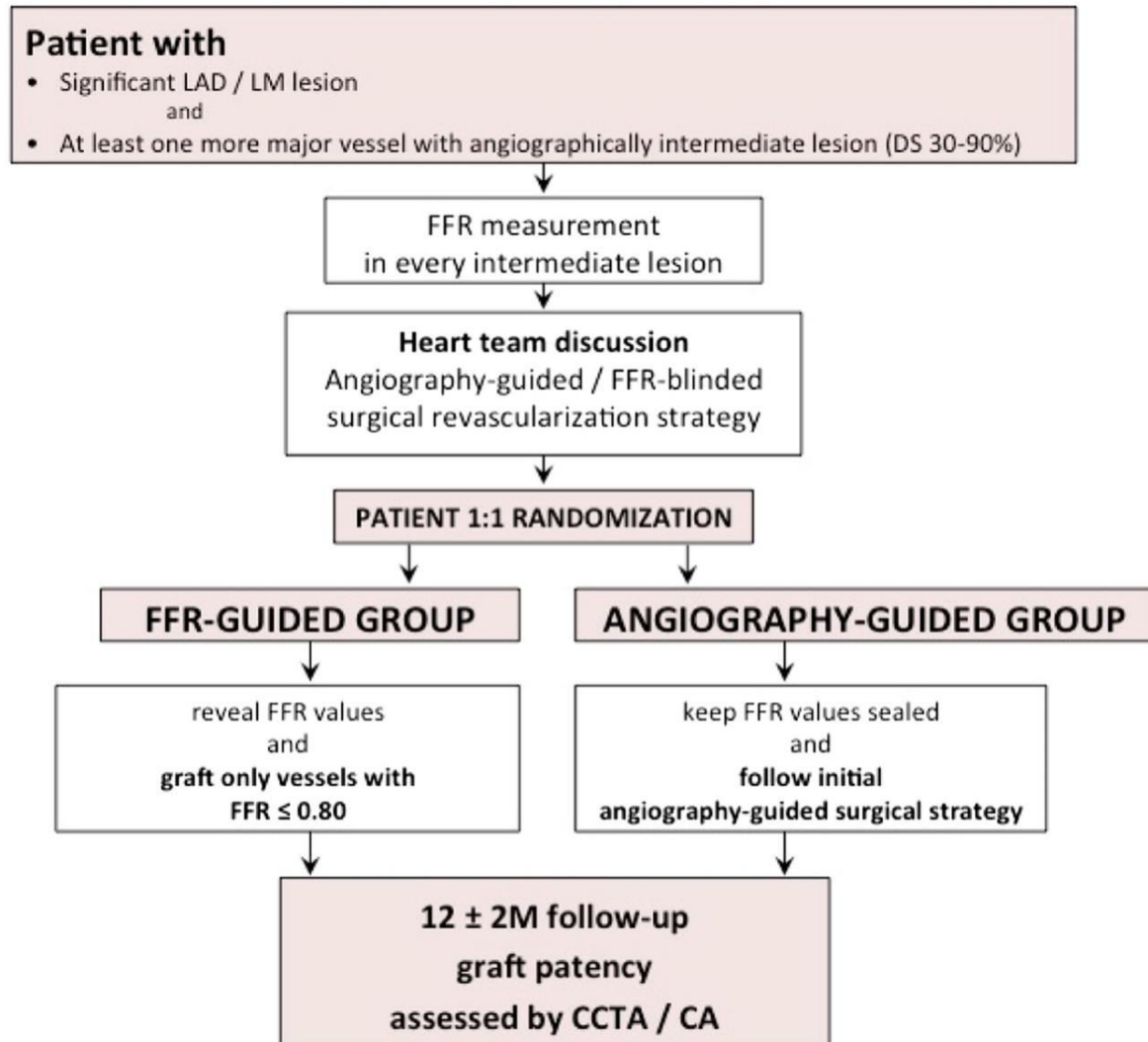


- *Grafting of coronaries with functionally non-significant stenoses is associated with higher risk of graft failure*
- *This is particularly true for arterial grafts*

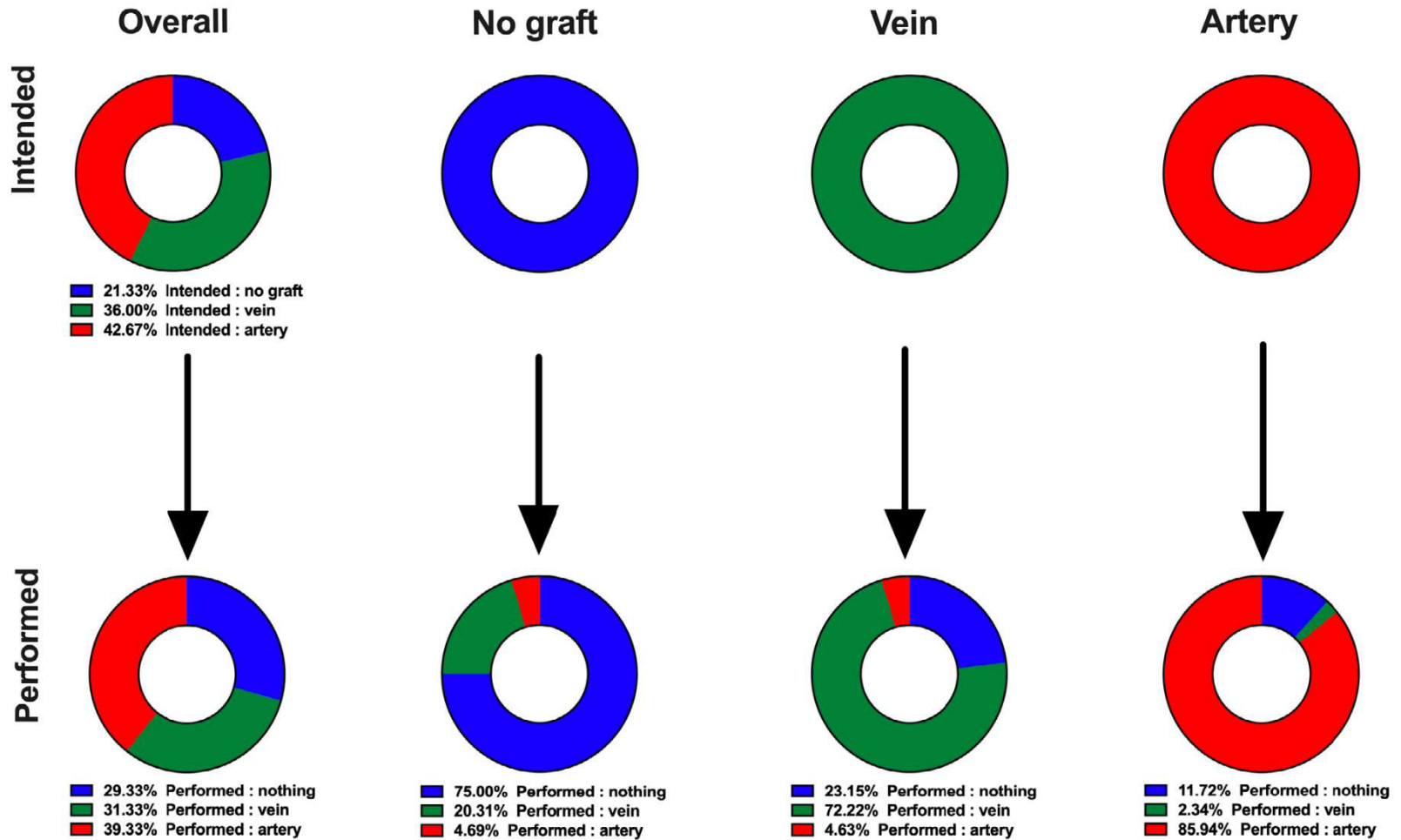
Question #3

How does FFR modify treatment strategies?

GRAFFITI



GRAFFITI



Change in surgical procedure in 55% of the patients

Question #3

How does FFR modify treatment strategies?

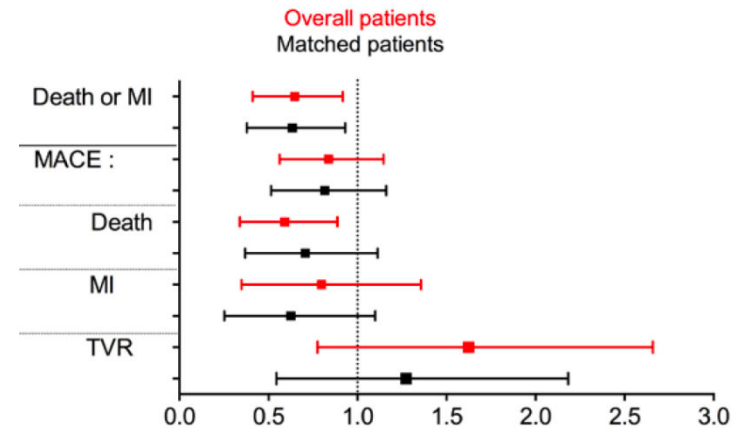
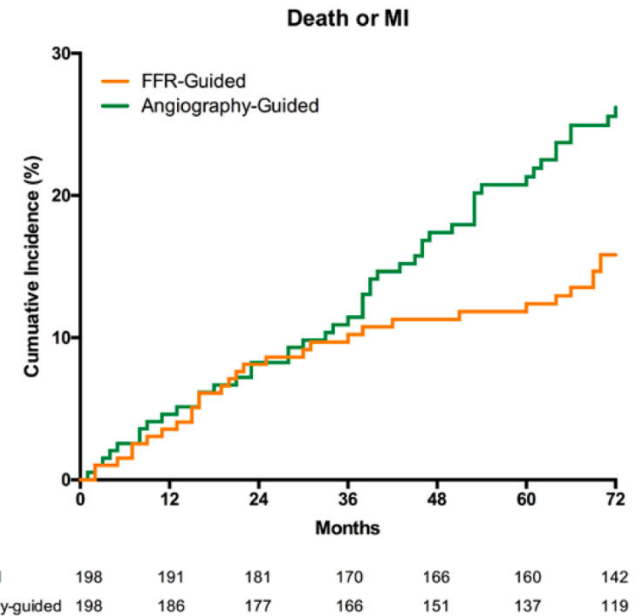
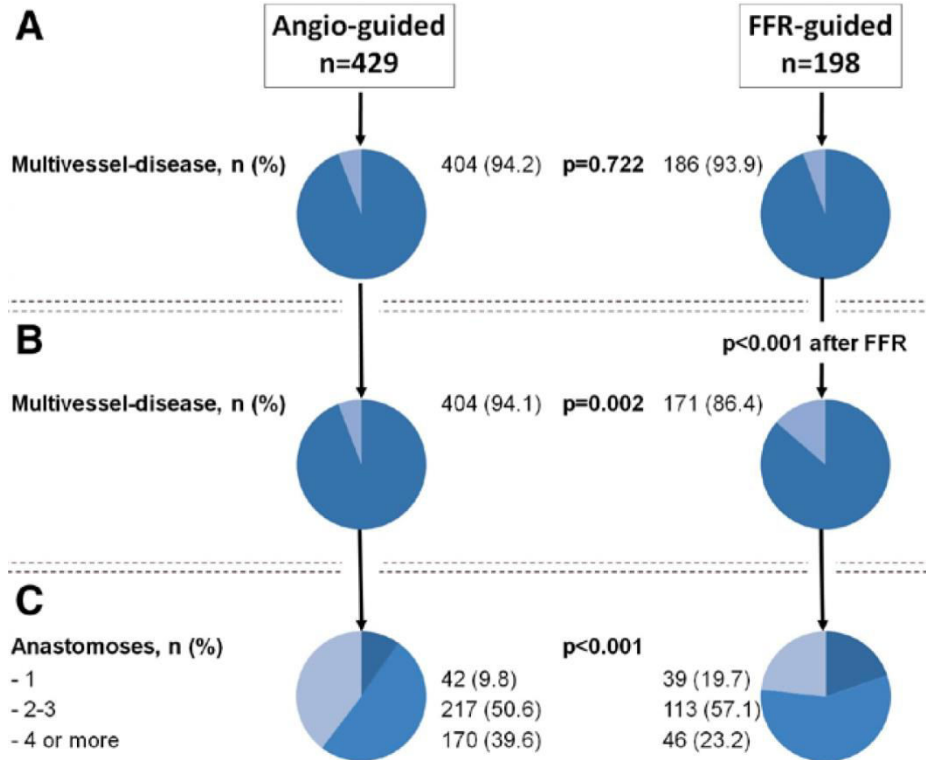


- *FFR-guided CABG is associated with a simplified surgical procedure in a significant proportion of patients*

Question #4

Is FFR-guided CABG better than angio-guided CABG?

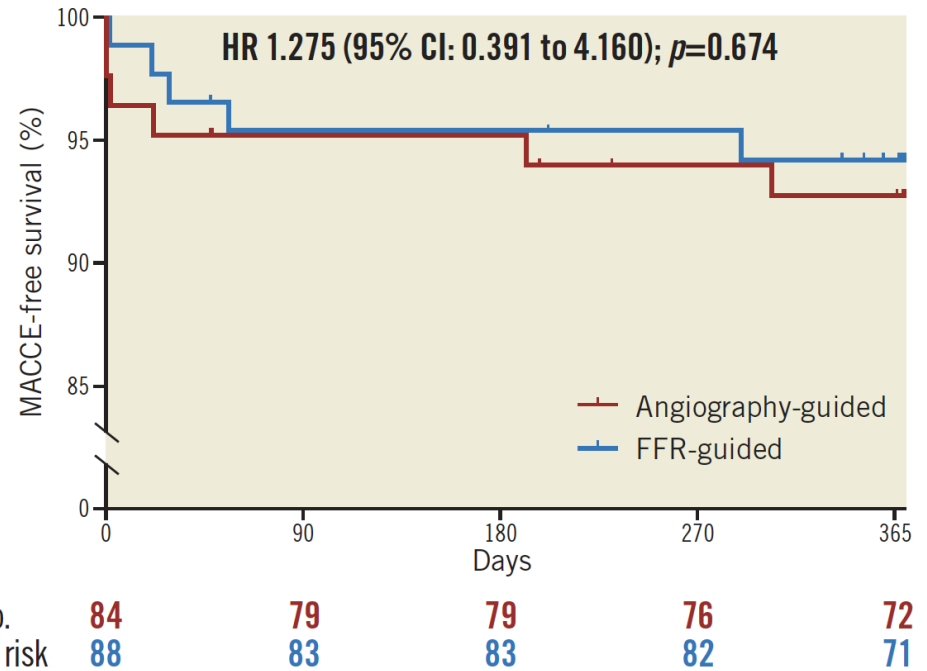
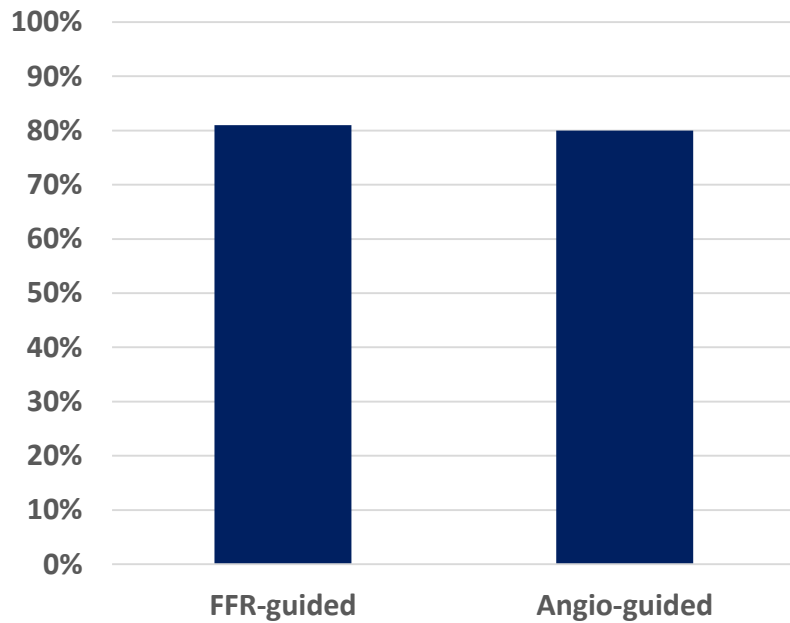
FFR-guided vs angio-guided PCI



FFR → better clinical outcomes with simpler procedures

GRAFFITI

Graft patency at 1 year



	Angio-guided	FFR-guided	p value
Off-pump surgery	14%	31%	0.010
Minimally invasive	2%	10%	0.036
Single graft	4%	15%	0.033
# of anastomoses	3 [3; 3]	2 [2; 3]	0.004
>3 anastomoses	62%	47%	0.048

Similar rates of graft patency and clinical outcomes with simplified procedures

FARGO

	FFR-Guided CABG (n = 94)	Angio-Guided CABG (n = 100)	p Value
Graft failures at 6 months			
All graft failures	15 (16)	13 (13)	0.56
Occluded grafts/ TIMI flow grade 0	7 (7)	6 (6)	0.89
Graft stenosis/TIMI flow grade 1–2	6 (6)	6 (6)	
Planned coronary artery not grafted	2 (2)	1 (1)	
Arterial graft failures at 6 months			
Arterial grafts at 6 months	38	32	
Arterial graft failures	5 (13)	5 (16)	0.76
Venous graft failures at 6 months			
Venous grafts at 6 months	56	68	
Venous graft failures	10 (18)	8 (12)	0.33

Similar rates of graft patency

Question #4

Is FFR-guided CABG better than angio-guided CABG?

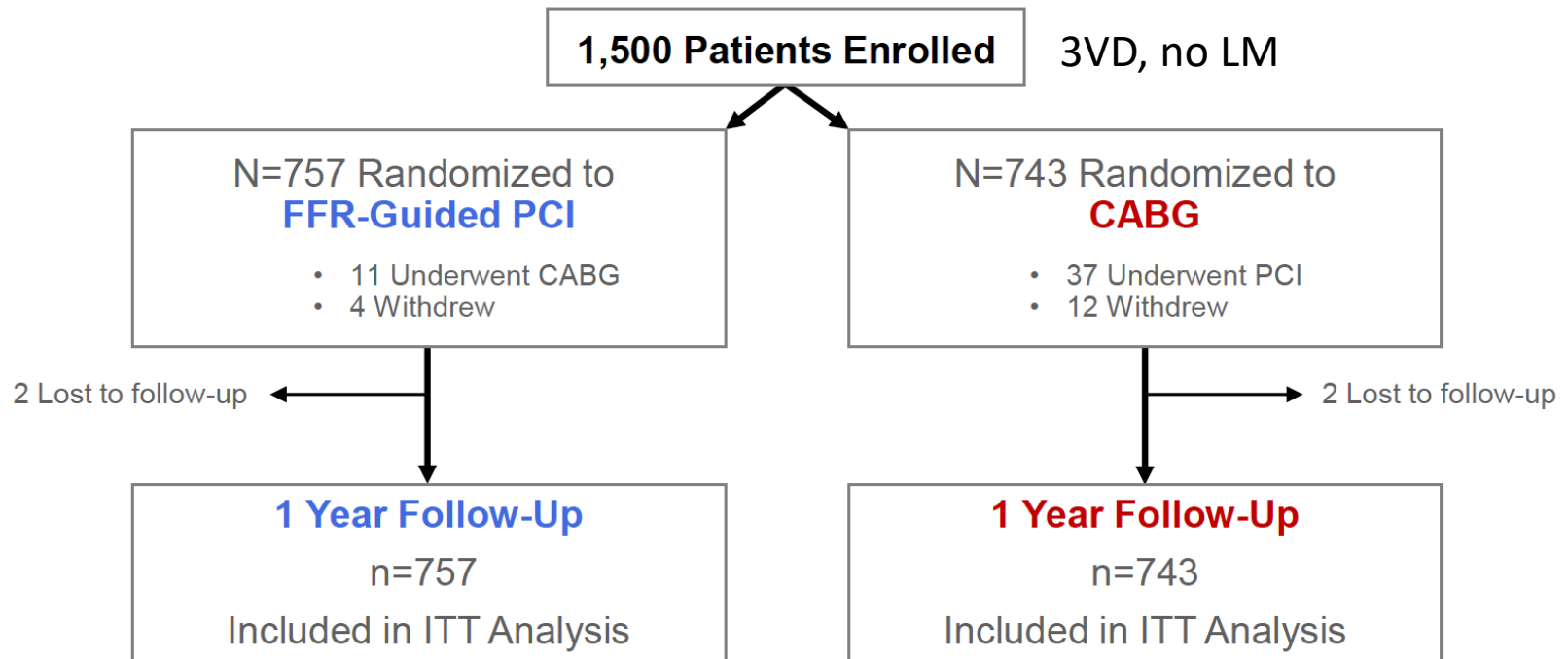


- *Same results in terms graft patency and clinical outcomes with simplified procedures*

Question #5

Is FFR-guided PCI better than CABG?

FAME-3



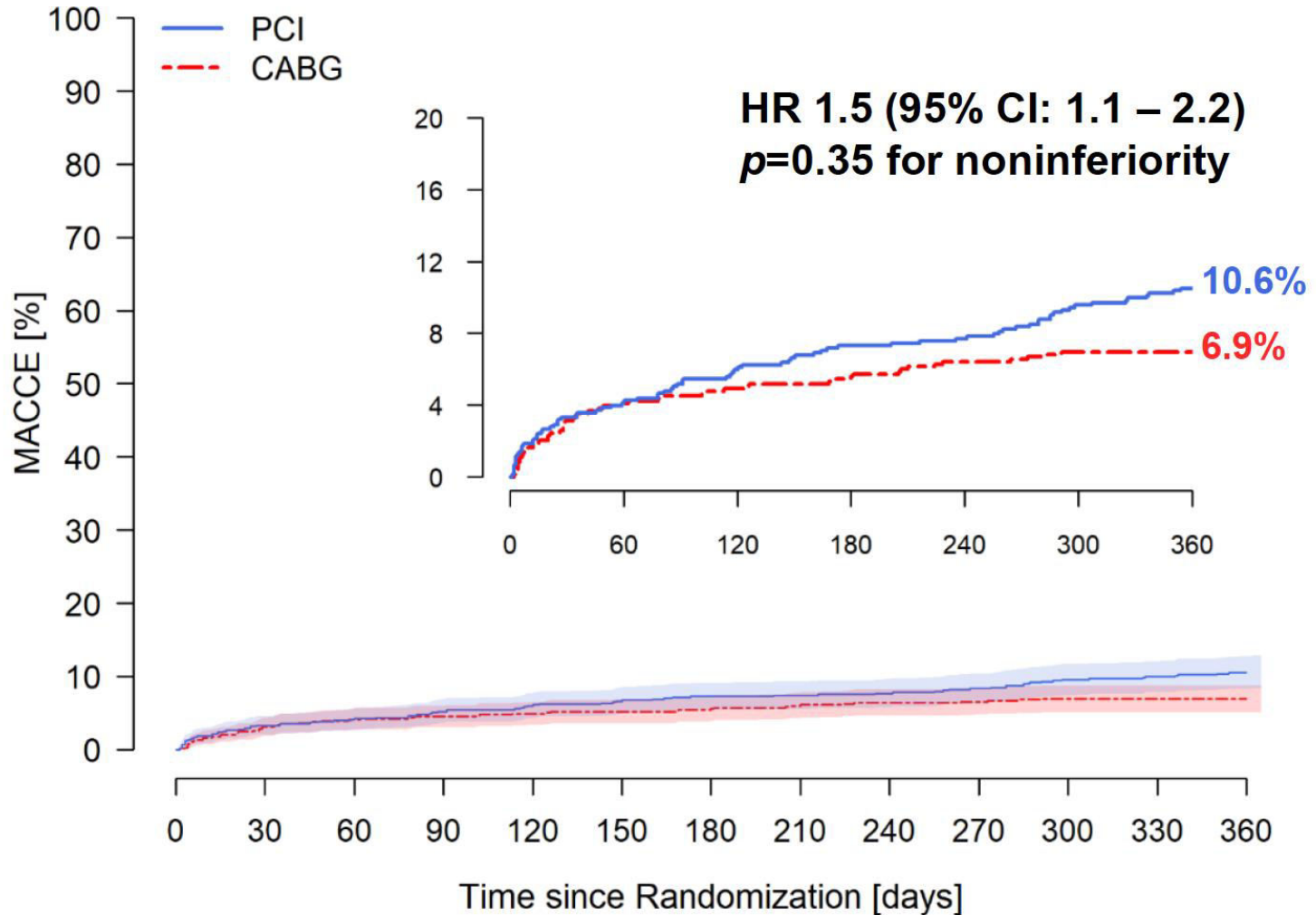
FFR-Guided PCI

- Preload with P2Y12 inhibitor and high dose statin
- FFR measured with intracoronary or intravenous adenosine
- PCI (Medtronic Resolute stent) only if FFR ≤ 0.80 (Abbott pressure wire)
- Post-PCI FFR measurement recommended
- DAPT for ≥ 6 months

CABG

- FFR-guided CABG not mandated, but FFR information from diagnostic angiogram could be used
- Pre-treatment with aspirin and high dose statin recommended
- On- or off-pump CABG acceptable
- LIMA in all cases
- Complete arterial revascularization recommended

FAME-3



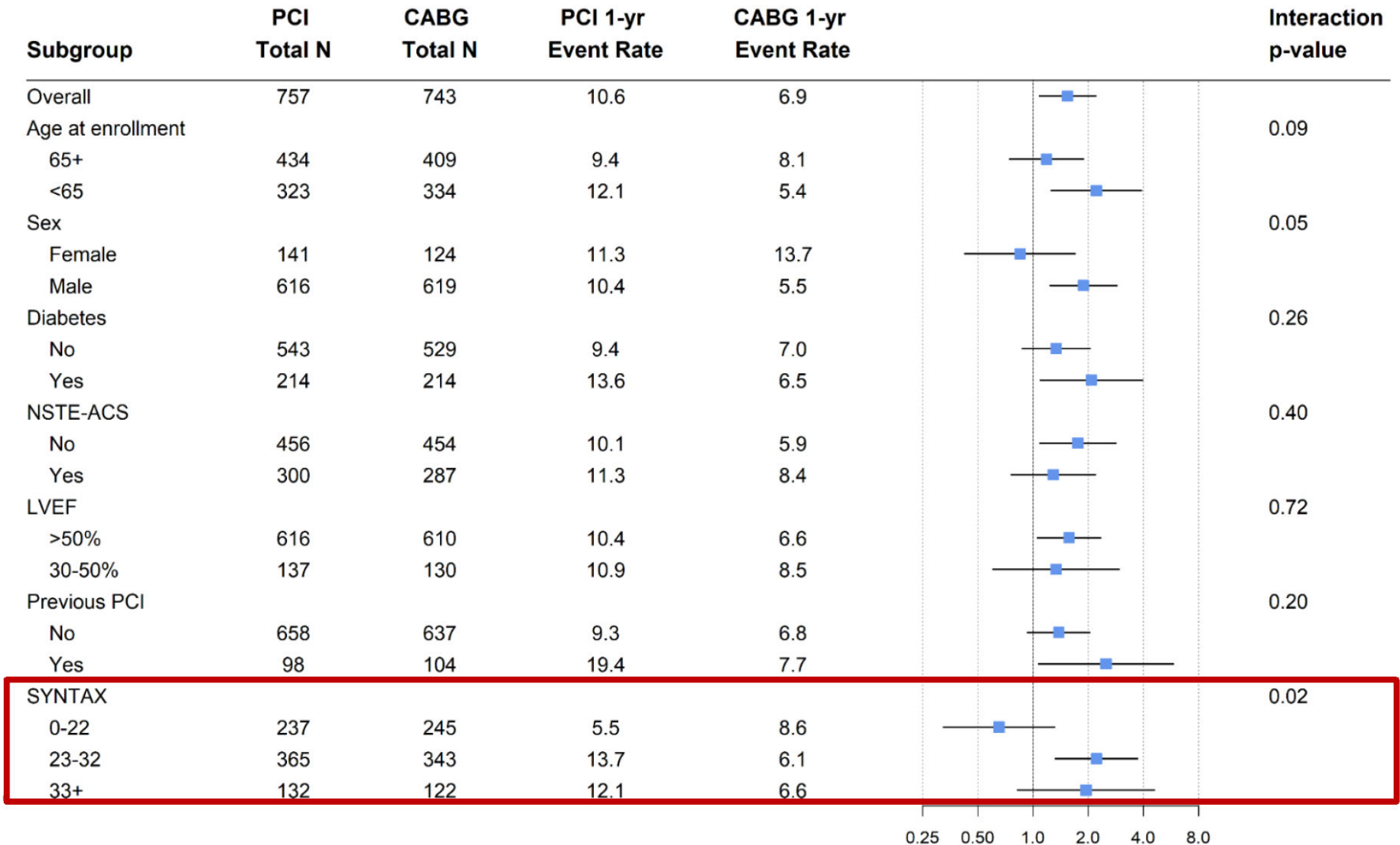
	No. at Risk												
PCI	757	728	721	713	707	702	697	696	693	687	678	674	670
CABG	743	709	701	698	695	693	691	686	683	682	679	679	679

FAME-3

Endpoint	PCI (n=757)	CABG (n=743)	Hazard Ratio
Death	1.6%	0.9%	1.7 (0.7-4.3)
Cardiac death	0.8%	0.5%	
MI	5.2%	3.5%	1.5 (0.9-2.5)
Procedural	1.7%	1.2%	
Spontaneous	3.3%	2.3%	
Stroke	0.9%	1.1%	0.9 (0.3-2.4)
Repeat Revascularization	5.9%	3.9%	1.5 (0.9-2.3)
Death, MI or Stroke	7.3%	5.2%	1.4 (0.9-2.1)

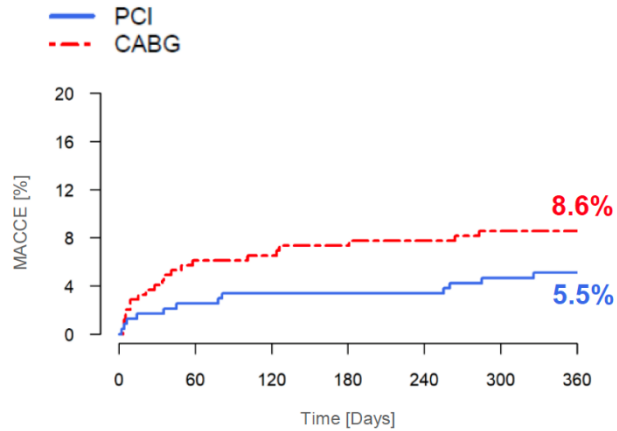
Endpoint	PCI (n=757)	CABG (n=743)	p-value
BARC Type 3-5 Bleeding	1.6%	3.8%	< 0.01
Acute Kidney Injury	0.1%	0.9%	< 0.04
Atrial Fibrillation/Arrhythmia	2.4%	14.1%	< 0.001
Definite Stent Thrombosis	0.8%	N/A	
Symptomatic Graft Occlusion	N/A	1.3%	
Rehospitalization w/in 30 days	5.5%	10.2%	< 0.001

FAME-3

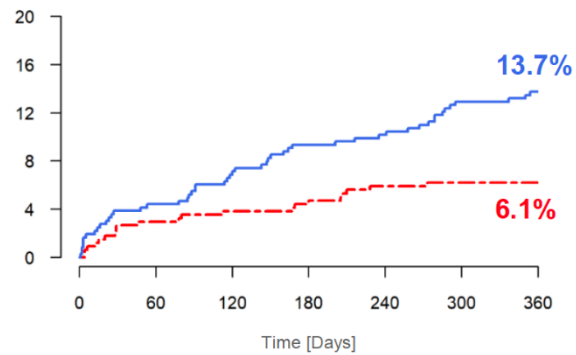


FAME-3

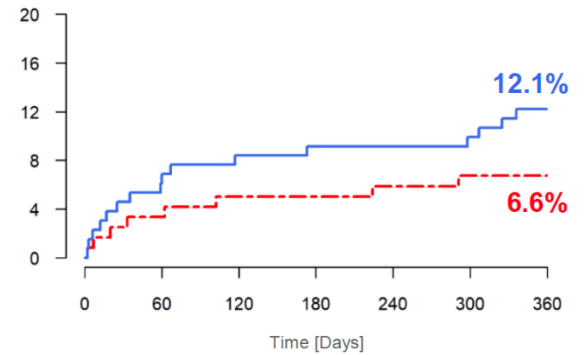
LOW (<23) SYNTAX SCORE



INTERMEDIATE (23-32) SYNTAX SCORE



HIGH (>32) SYNTAX SCORE

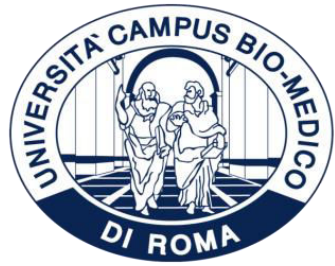


Question #5

Is FFR-guided PCI better than CABG?



- *No. In patients with complex 3V-CAD, CABG remains the treatment of choice*
- *FFR-guided PCI might be a choice in 3V-CAD patients with less complex disease*



“You know what the issue is with this world?

***Everyone wants a magical solution to their problem, and
everyone refuses to believe in magic”***

Alice in Wonderland

f.mangiacapra@policlinicocampus.it