



Fractional Flow Reserve-Guided PCI Compared with Coronary Bypass Surgery:

The FAME 3 Trial

William F. Fearon, MD

On Behalf of the FAME 3 Investigators

Background

- Previous studies have demonstrated improved outcomes with CABG compared with PCI in patients with 3-vessel CAD.¹
- However, most trials used BMS or 1st generation DES.²
- In addition, none of these studies measured fractional flow reserve (FFR) to guide PCI.³

¹ Serruys PW, et al. *N Engl J Med* 2009;360:961-72.

² Stone GW, et al. *N Engl J Med* 2010; 362:1663-1674.

³ Tonino PAL, et al. *N Engl J Med* 2009;360:213-24.



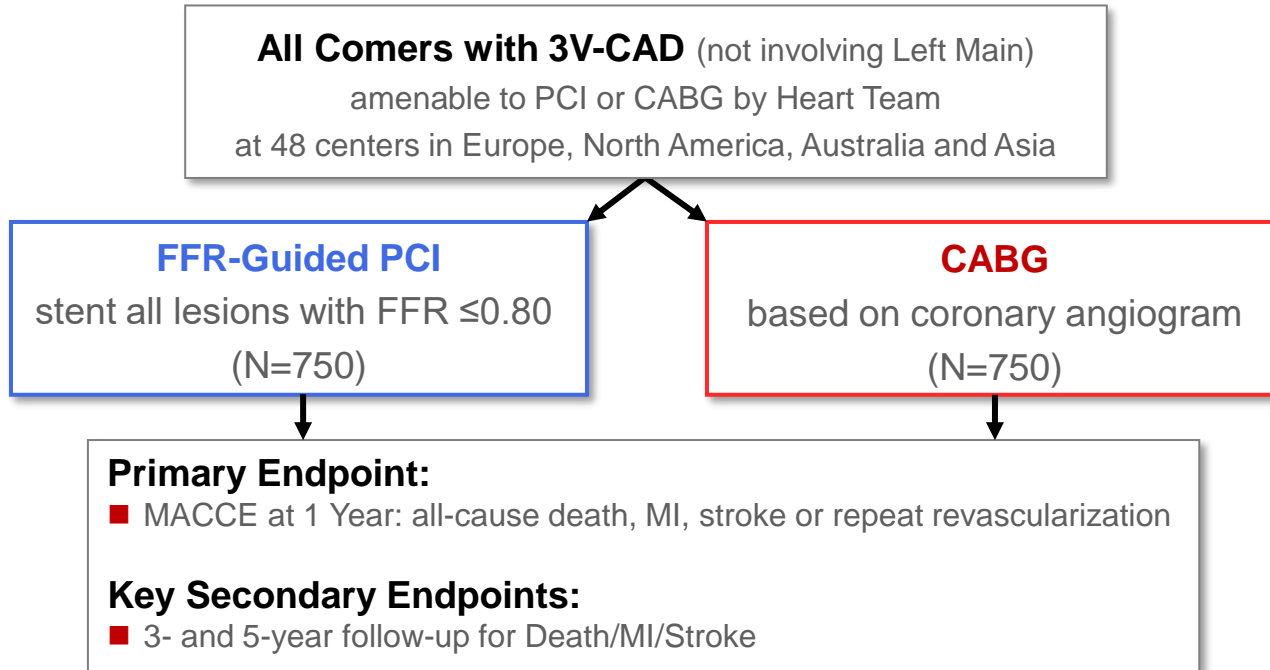
FAME 3 Trial Hypothesis

In patients with 3V-CAD, FFR-guided PCI with a current generation DES is noninferior to CABG with respect to 1-year MACCE.



Study Design

Investigator-initiated, multicenter, randomized, controlled study



Patient Eligibility

Key Inclusion Criteria

- Three vessel CAD:
 - $\geq 50\%$ diameter stenosis in 3 major epicardial vessels (visual estimation, no Left Main involvement)
 - Amenable to revascularization by both PCI and CABG (Heart Team)

Key Exclusion Criteria

- Cardiogenic shock
- Recent STEMI (within 5 days)
- LV ejection fraction $< 30\%$



Procedural Requirements

FFR-Guided PCI

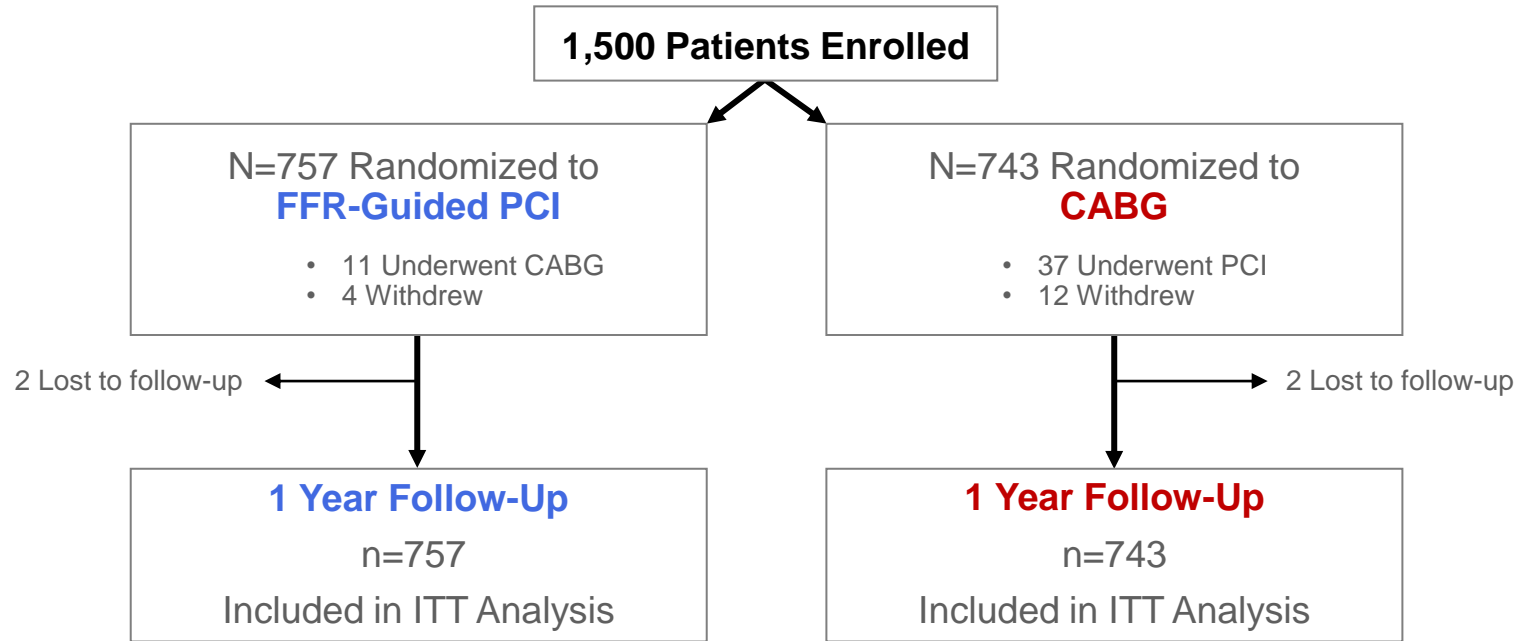
- Preload with P2Y12 inhibitor and high dose statin
- FFR measured with intracoronary or intravenous adenosine
- PCI (Medtronic Resolute stent) only if $FFR \leq 0.80$ (Abbott pressure wire)
- Post-PCI FFR measurement recommended
- DAPT for ≥ 6 months

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



Patient Flowchart



Baseline Characteristics

Variable	PCI (n=757)	CABG (n=743)
Age	65 ± 8 years	65 ± 8 years
Male	81%	83%
Caucasian	94%	92%
HTN	71%	75%
Dyslipidemia	69%	72%
Current Tobacco Use	19%	18%
Diabetes	28%	29%
Insulin dependent	7%	8%
ACS presentation	40%	39%
EF≤50%	18%	18%
Prior PCI	13%	14%



Procedural Characteristics

Variable	PCI (n=757)	CABG (n=743)
Time to procedure	4 days	13 days
Procedure duration	87 min	197 min
Length of hospital stay	3 days	11 days
Number of lesions	4.3	4.2
≥1 Chronic occlusion	21%	23%
≥1 Bifurcation lesion	69%	66%
SYNTAX Score	26	26
Low (0-22)	32%	35%
Intermediate (23-32)	50%	48%
High (>33)	18%	17%



Procedural Characteristics

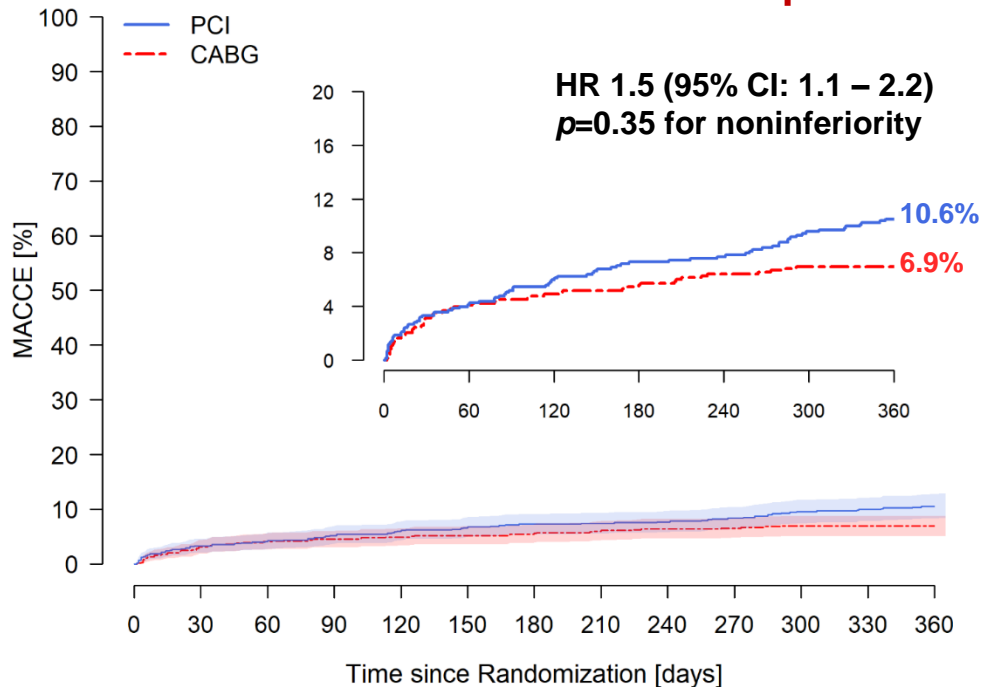
Variable	PCI (n=757)
% Lesions FFR measured	82%
FFR>0.80	24%
Staged procedure	22%
Number of stents	3.7±1.9
Total stent length	80 mm
Intravascular imaging	12%
FFR measured after PCI	60%

Variable	CABG (n=743)
FFR measured prior to CABG	10%
# of distal anastomoses	3.4±1.0
Multiple arterial grafts	25%
LIMA	97%
Off-Pump surgery	24%



Primary Endpoint

MACCE (Death, MI, stroke or repeat revascularization) at 1 Year



	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



Secondary Endpoints

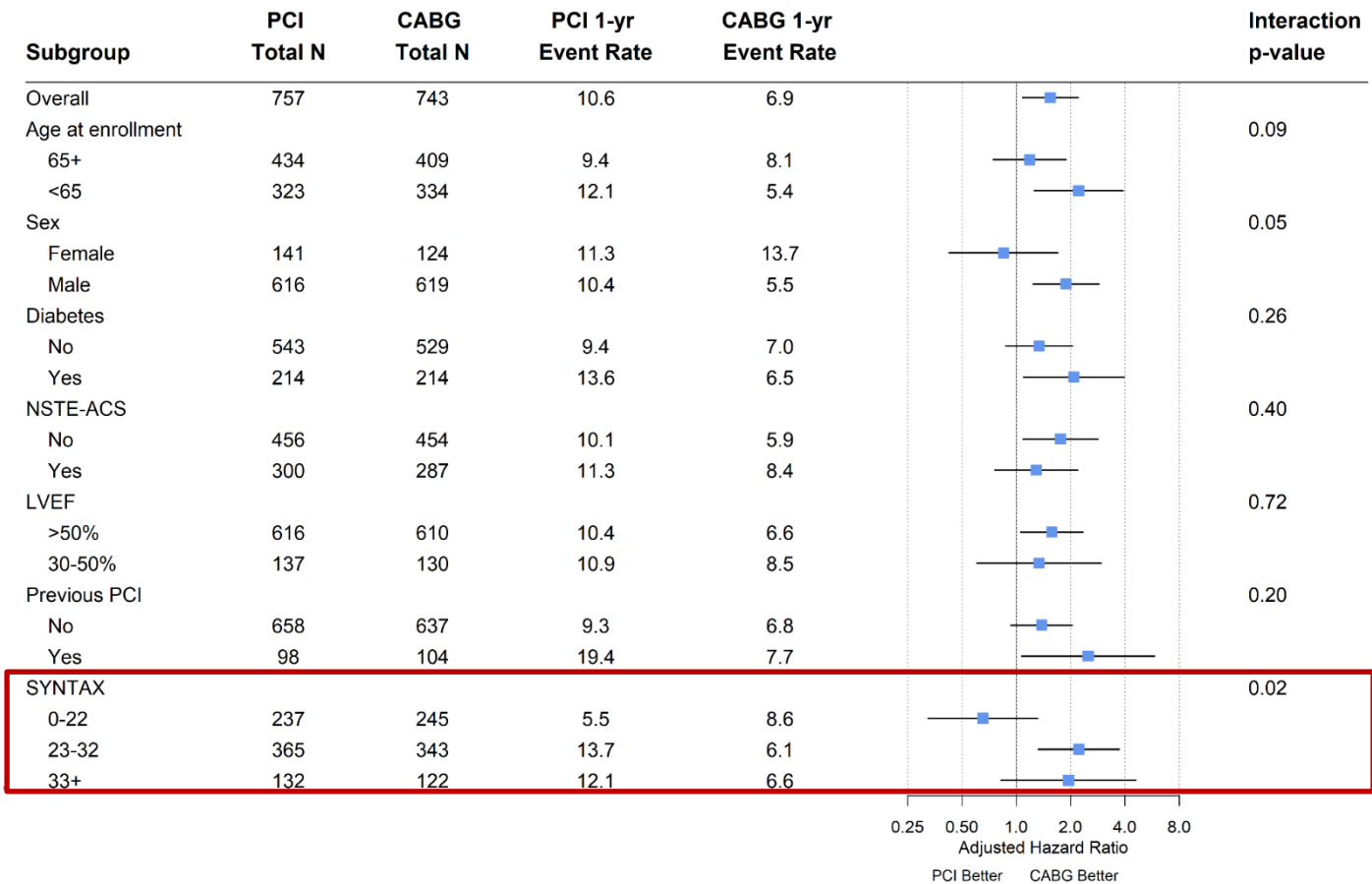
Endpoint	PCI (n=757)	CABG (n=743)	Hazard Ratio
Death	1.6%	0.9%	1.7 (0.7-4.3)
Cardiac death	0.8%	0.5%	
MI	5.2%	3.5%	1.5 (0.9-2.5)
Procedural	1.7%	1.2%	
Spontaneous	3.3%	2.3%	
Stroke	0.9%	1.1%	0.9 (0.3-2.4)
Repeat Revascularization	5.9%	3.9%	1.5 (0.9-2.3)
Death, MI or Stroke	7.3%	5.2%	1.4 (0.9-2.1)

Safety Endpoints

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

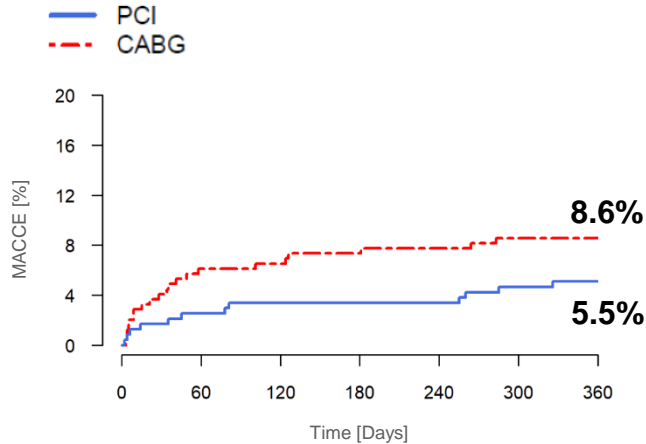


Subgroup Analysis

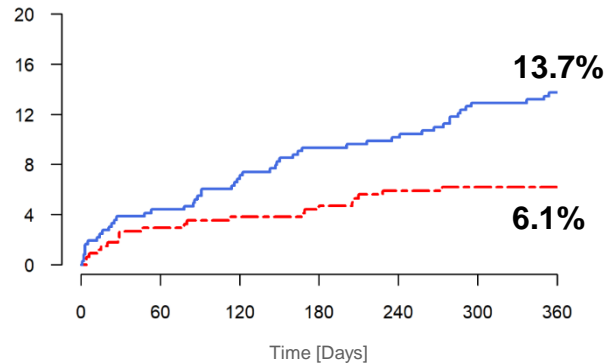


MACCE According to SYNTAX Score

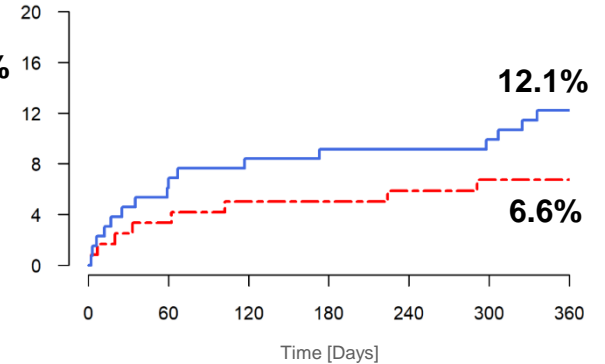
LOW (<23) SYNTAX SCORE



INTERMEDIATE (23-32) SYNTAX SCORE

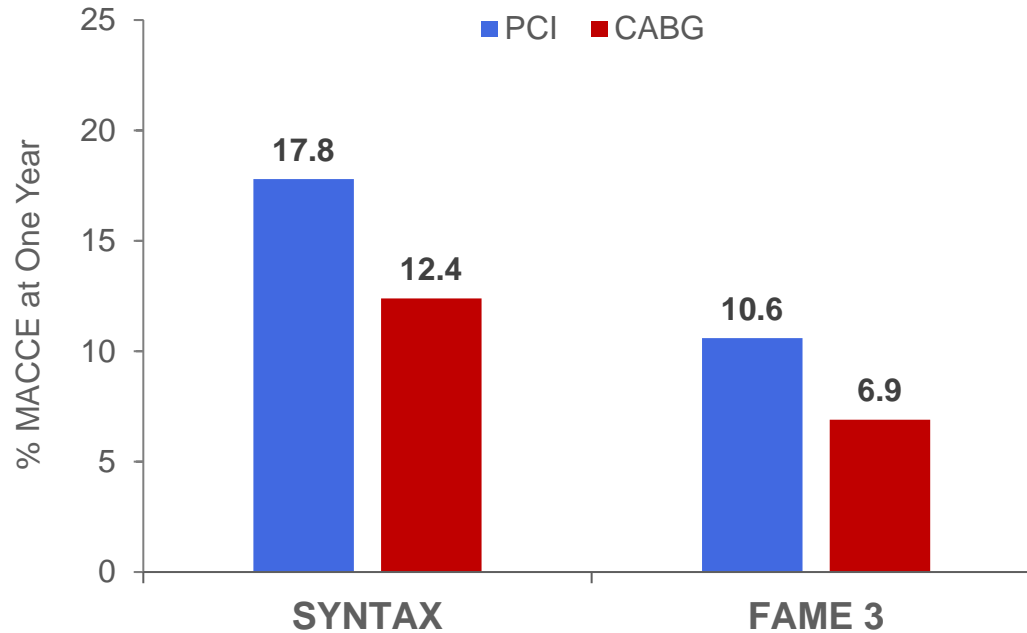


HIGH (>32) SYNTAX SCORE



FAME 3 and SYNTAX Trials

MACCE (Death, MI, Stroke, or Repeat Revascularization) at 1 Year



Limitations

- One year is relatively short-term follow-up
- FFR measurement not mandated in CABG arm
- Intravascular imaging utilized in only 12% in PCI arm
- Completeness of revascularization data not yet available



Conclusions

- In patients with 3V-CAD, FFR-Guided PCI with a current generation DES did not meet the criterion set for noninferiority in comparison with CABG in terms of death, MI, stroke or revascularization at one year
 - One-year rate of death, MI or stroke was not significantly different between the two groups
 - In FAME 3, MACCE rates for both FFR-guided PCI (10.6%) and CABG (6.9%) were lower than with CABG in the SYNTAX trial (12.4%)
 - FFR-guided PCI with a current generation DES performed favorably in comparison with CABG in 3V-CAD patients with less complex disease according to the SYNTAX score
 - In patients with more complex 3V-CAD, CABG remains the treatment of choice

