





**ORIGINAL RESEARCH**

# Clinical Outcome of Revascularization Deferral With Instantaneous Wave-Free Ratio and Fractional Flow Reserve: A 5-Year Follow-Up Substudy From the iFR-SWEDEHEART Trial

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**BACKGROUND:** Although physiology-based assessment of coronary artery stenosis using instantaneous wave-free ratio (iFR) and fractional flow reserve (FFR) are established methods of guiding coronary revascularization, its clinical outcome in long-term deferral needs further evaluation, especially with acute coronary syndrome as a clinical presentation. The aim was to evaluate the long-term clinical outcome of deferral of revascularization based on iFR or FFR.

**METHODS AND RESULTS:** This is a substudy of the iFR-SWEDEHEART (Instantaneous Wave-Free Ratio Versus Fractional Flow Reserve in Patients With Stable Angina Pectoris or Acute Coronary Syndrome) randomized clinical trial, where patients deferred from revascularization from each study arm were selected. Nine hundred eight patients deferred from coronary revascularization with iFR (n=473) and FFR (n=435) were followed for 5 years. The national quality registry, SWEDEHEART (Swedish Web-System for Enhancement and Development of Evidence-Based Care in Heart Disease Evaluated According to Recommended Therapies), was used for patient data collection and clinical follow-up. The end point was major adverse cardiac events and their individual components all-cause death, cardiovascular death, noncardiovascular death, nonfatal myocardial infarction, and unplanned revascularization. No significant difference was found in major adverse cardiac events (iFR 18.6% versus FFR 16.8%; adjusted hazard ratio, 1.08 [95% CI, 0.79–1.48];  $P=0.63$ ) or their individual components.

**CONCLUSIONS:** No differences in clinical outcomes after 5-year follow-up were noted when comparing iFR versus FFR as methods for deferral of coronary revascularization in patients presenting with stable angina pectoris and acute coronary syndrome.

**REGISTRATION:** URL: <https://www.clinicaltrials.gov>; Unique identifier: NCT02166736.

**Key Words:** acute coronary syndrome ■ fractional flow reserve ■ instantaneous wave-free ratio ■ stable angina pectoris

Instantaneous wave-free ratio (iFR) and fractional flow reserve (FFR) are established physiology-based methods recommended in clinical guidelines for guiding coronary revascularization in intermediate-grade stenoses.<sup>1</sup> The FFR guidance of coronary revascularization has been evaluated in several studies beginning in the early 1990s, and its long-term safety has been established.<sup>2–6</sup>

In 2 large randomized clinical trials, iFR-SWEDEHEART (Instantaneous Wave-Free Ratio Versus Fractional Flow Reserve in Patients With Stable Angina Pectoris or Acute Coronary Syndrome) and DEFINE-FLAIR (Functional Lesion Assessment of Intermediate Stenosis to Guide Revascularization), the resting index iFR was found to be noninferior to FFR

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## CLINICAL PERSPECTIVE

### What Is New?

- Instantaneous wave-free ratio and fractional flow reserve can be used as valuable methods for deferral of coronary artery stenoses in the long-term perspective in patients presenting with stable angina pectoris and acute coronary syndrome.

### What Are the Clinical Implications?

- Instantaneous wave-free ratio and fractional flow reserve can be used in clinical practice interchangeably to assess lesion severity with similar long-term clinical outcomes.

## Nonstandard Abbreviations and Acronyms

<b>FFR</b>	fractional flow reserve
<b>iFR</b>	instantaneous wave-free ratio
<b>iFR-SWEDEHEART</b>	Instantaneous Wave-Free Ratio Versus Fractional Flow Reserve in Patients With Stable Angina Pectoris or Acute Coronary Syndrome
<b>MACE</b>	major adverse cardiac event
<b>SAP</b>	stable angina pectoris

in guiding coronary revascularization with respect to clinical outcome at 1 year.<sup>7,8</sup> Although iFR had previously been validated in several small studies,<sup>9–12</sup> the results of the cited randomized studies provided evidence to support its use to guide coronary revascularization. Combining the populations of the 2 studies<sup>7,8</sup> provided a unique opportunity to investigate the deferral of revascularization based on iFR and FFR using current cutoff values and medical treatment. Results from the pooled population revealed no difference between iFR and FFR in the rate of major adverse cardiac events (MACEs) at 1 year among patients who were deferred from revascularization.<sup>13</sup> The observed event rate among patients presenting with acute coronary syndrome (ACS) was significantly higher than that of patients presenting with stable angina pectoris (SAP).

Recently published 5-year results from the iFR-SWEDEHEART trial confirm the long-term safety of iFR-guided revascularization.<sup>14</sup> However, this also provided the opportunity to evaluate deferral of revascularization long term in both iFR and FFR in a large

patient population, making it one of the largest long-term deferral studies in the field.

The objective of this study was to investigate the 5-year outcome of patients deferred from revascularization in the iFR-SWEDEHEART trial. We investigated the long-term clinical outcomes of deferral with iFR and FFR as well as clinical outcomes by clinical presentation.

## METHODS

### Study Design of the iFR-SWEDEHEART Trial

iFR-SWEDEHEART was a multicenter, randomized controlled, open-label clinical trial.<sup>7</sup> A national quality registry, SWEDEHEART (Swedish Web-System for Enhancement and Development of Evidence-Based Care in Heart Disease Evaluated According to Recommended Therapies), was accessed for patient data collection, randomization, and clinical follow-up from year 1 through year 5. The trial was conducted in compliance with the Declaration of Helsinki criteria and approved by the ethical review boards of Sweden, Denmark, and Iceland. It was funded by an unrestricted research grant from the Volcano Corporation, which had no influence over the study design, analysis, or reporting of results.

All patients were included in the web-based SCAAR (Swedish Coronary Angiography and Angioplasty Registry) platform, a component of the SWEDEHEART registry. The SCAAR contains data from a single catheterization laboratory in Iceland and all 30 catheterization laboratory centers in Sweden. A center in Denmark participated, entering all relevant data from the Western Denmark Heart Registry into SCAAR. After baseline information was entered, patients were randomized to undergo revascularization guided by either iFR or FFR. Relevant follow-up data were obtained from the national registries.

### Study Design of the Present Study

The present study is a substudy of clinical outcomes of the deferred population from the iFR-SWEDEHEART trial at 5-year follow-up. This means no revascularizations were performed on patients included in this study. A subgroup analysis comparing clinical presentation of ACS and SAP was included. The authors declare that all supporting data are available within the article.

### Study Population

The study population comprised patients with SAP and ACS, including unstable angina pectoris and non-ST-segment-elevation myocardial infarction. The patients exhibited indications for physiologically guided

assessment of at least 1 coronary lesion as determined by the operator (lesions with 40%–80% stenosis by visual estimate). In patients with SAP, any lesion could be assessed, whereas in those with ACS, only non-culprit lesions were assessed using physiology-based techniques. Major exclusion criteria were known terminal disease with a life expectancy of <1 year, unstable hemodynamic, inability to tolerate adenosine, previous coronary artery bypass grafting with patent graft to the interrogated vessel, heavily calcified or tortuous vessel in which ability to cross the lesion with a pressure wire was unlikely, inability to provide informed consent, and previous randomization in the iFR-SWEDEHEART trial. All participants provided written informed consent before enrolment.

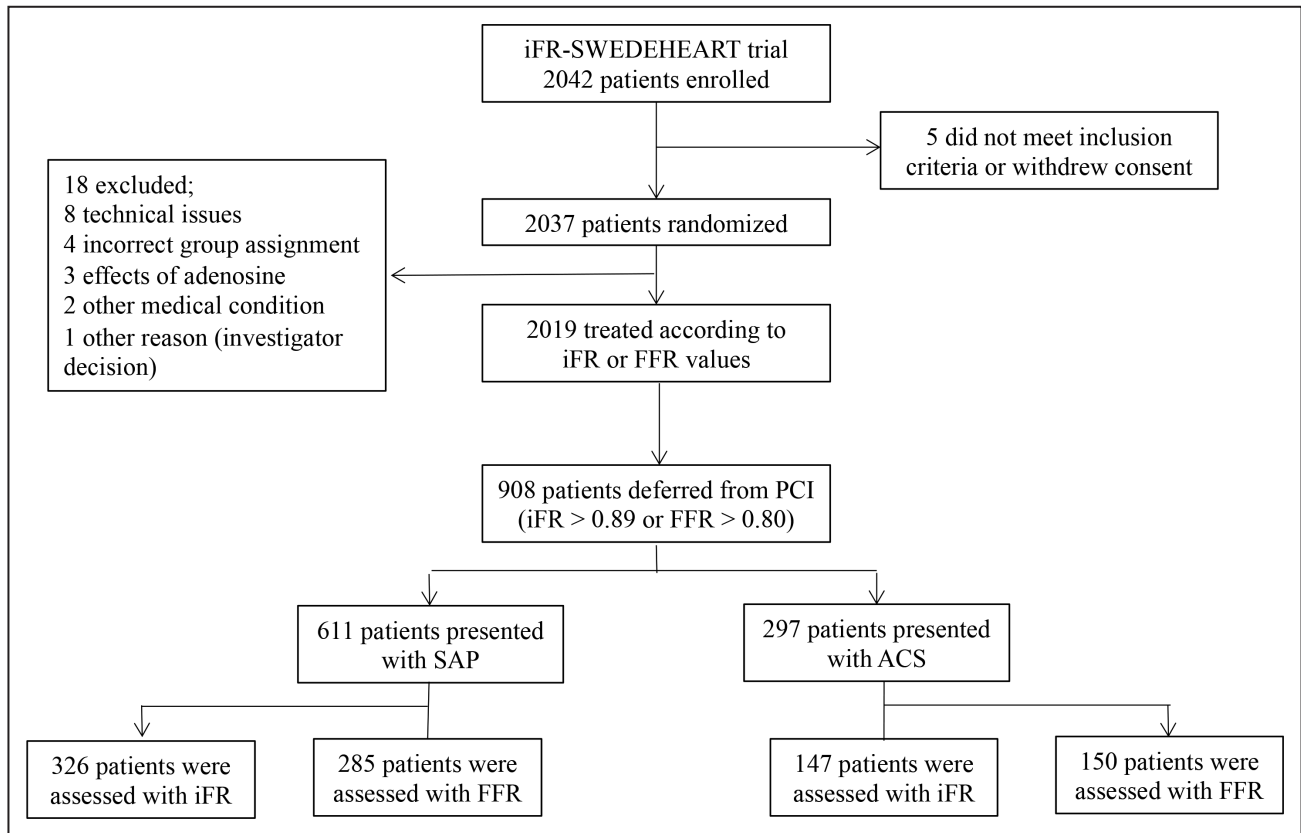
**Procedure**

A coronary-pressure guidewire (Philips Volcano) was used for measurement of iFR and FFR. Intracoronary nitroglycerin was administered before the procedure to prevent any coronary spasms that would otherwise affect the measurements. Hyperemia during FFR was induced with adenosine either as an intracoronary bolus injection or as an intravenous infusion until stable

hyperemia was obtained. The thresholds for indication of a hemodynamically important stenosis were pre-specified as 0.89 for iFR and 0.80 for FFR. Treatment was deferred with values over these thresholds. The physician, according to clinical practice, determined the pharmacological treatment.

**End Points**

The primary end point was the rate of MACEs, defined as all-cause death, nonfatal myocardial infarction (MI), or unplanned revascularization at 5 years. Secondary end points included MACEs and their individual components. The patients’ unique Swedish personal identification numbers were linked to the Swedish National Population Registry by the Epidemiologic Center of the Swedish National Board of Health and Welfare to obtain information of mortality. Information about nonfatal MI and unplanned revascularization were obtained from SWEDEHEART. The definition of unplanned revascularization was revascularization by either percutaneous coronary intervention or coronary artery bypass grafting that was not anticipated at the index procedure and not a part of a staged procedure to be performed within 60 days.



**Figure 1. Flowchart of study design.**

A total of 2042 patients were enrolled in the iFR-SWEDEHEART (Instantaneous Wave-Free Ratio Versus Fractional Flow Reserve in Patients With Stable Angina Pectoris or Acute Coronary Syndrome) randomized clinical trial, with 2019 patients included for the final analysis and 908 patients deferred from coronary revascularization. ACS indicates acute coronary syndrome; FFR, fractional flow reserve; iFR, instantaneous wave-free ratio; PCI, percutaneous coronary intervention; and SAP, stable angina pectoris.

## Statistical Analysis

Categorical data are presented as counts and percentages and tested with  $\chi^2$ . Continuous variables are presented as mean $\pm$ SD and tested with a 2-tailed Student *t* test. Missing values constituted <2% of data and were ignored in all analyses. The end point of MACEs and their individual components of all-cause death, cardiovascular death, noncardiovascular death, nonfatal MI, and unplanned revascularization were analyzed on a per-protocol basis. A time-to-event analysis was performed by Cox proportional hazard models. The validity of the proportional hazard assumption was tested. Results are presented with hazard ratio (HR) and 2-sided 95% CI. Results were analyzed unadjusted as well as adjusted for age, sex, body mass index, diabetes, hypertension, hyperlipidemia, smoking status, previous MI, previous percutaneous coronary intervention, and clinical presentation. A 2-sided *P* value <0.05 was considered statistically significant. Kaplan-Meier survival curves were plotted for visual comparison of iFR and FFR groups and clinical presentation. All statistical analyses were performed using Stata version 17 (StataCorp).

## RESULTS

### Study Population

From May 2014 through October 2015, 2037 patients were randomized to undergo either iFR- or FFR-guided revascularization (Figure 1). A total of 2019 patients were included in the final analysis of the original randomized iFR-SWEDEHEART trial after exclusion of 18 patients because of technical issues, incorrect group assignment, side effects of adenosine, other medical conditions, or other reasons. Revascularization was deferred in all investigated vessels in 908 patients, 473 patients (52%) with iFR and 435 (48%) with FFR. Six hundred eleven patients presented with SAP, and 297 patients with ACS.

### Baseline and Procedural Characteristics

Patient baseline characteristics are presented in Table 1. There was a significant difference in Canadian Cardiovascular Society grade of angina in the iFR group (class I, 34.7%; class II, 62.5%; class III, 2.5%) and FFR group (class I, 29.3%; class II, 59.0%; class III, 10.9%; *P*<0.05). The 2 groups were well balanced in the remaining baseline characteristics.

### End Point and Components

At 5 years, the rate of MACEs was 18.6% in the iFR group and 16.8% in the FFR group (adjusted HR, 1.08 [95% CI, 0.79–1.48]; *P*=0.63; Figure 2). There were no significant differences in all-cause death (iFR 7.6%

**Table 1. Baseline Characteristics**

Characteristic	iFR, n=473	FFR, n=435	<i>P</i> value
Age, y, M $\pm$ SD	67.4 $\pm$ 9.7	67.2 $\pm$ 9.3	0.80
Men, % (n)	68.3 (323)	67.4 (293)	0.76
Body mass index, kg/m <sup>2</sup> , M $\pm$ SD	27.4 $\pm$ 4.3	27.5 $\pm$ 4.5	0.74
Diabetes, % (n)	17.6 (83)	17.5 (76)	0.36
Hypertension, % (n)	72.5 (342)	69.7 (303)	0.23
Hyperlipidemia, % (n)	74.4 (351)	68.7 (299)	0.10
Nonsmoker, % (n)	33.6 (159)	36.6 (159)	<0.05
Current smoker, % (n)	16.1 (76)	15.6 (68)	
Previous smoker, % (n)	49.9 (236)	45.7 (199)	
Previous MI, % (n)	33.1 (156)	33.1 (144)	0.16
Previous PCI, % (n)	46.3 (219)	43.5 (189)	0.39
CCS angina class			<0.05
I, % (n)	34.7 (96)	29.3 (67)	
II, % (n)	62.5 (173)	59.0 (135)	
III, % (n)	2.5 (7)	10.9 (25)	
IV, %	0	0	
Clinical presentation			0.28
Acute coronary syndrome, % (n)	31.1 (147)	34.5 (150)	
Stable angina pectoris, % (n)	68.9 (326)	65.5 (285)	

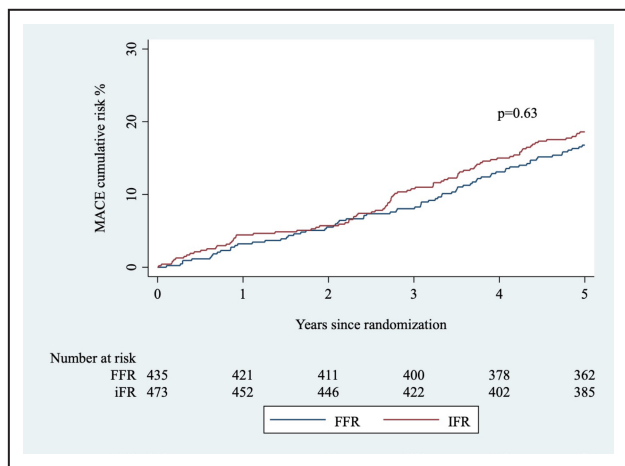
CCS indicates Canadian Cardiovascular Society; FFR, fractional flow reserve; iFR, instantaneous wave-free ratio; MI, mean; MI, myocardial infarction; and PCI, percutaneous coronary intervention.

versus FFR 6.7%, *P*=0.62), cardiovascular death (iFR 1.9% versus FFR 2.0%, *P*=0.94), noncardiovascular death (iFR 5.7% versus FFR 4.6%, *P*=0.52), nonfatal MI (iFR 5.3% versus FFR 5.5%, *P*=0.80), or unplanned revascularization (iFR 9.7% versus FFR 9.2%, *P*=0.89; Table 2). Unplanned revascularization was the most frequent component of MACEs in both groups.

When outcome at 5 years was adjusted by clinical presentation, there was no difference in the composite end point of MACEs (SAP 16.7% versus ACS 19.9%; adjusted HR, 0.85 [95% CI, 0.61–1.19]; *P*=0.36). The HRs for the individual components of MACE adjusted by clinical presentation were not significant (Table 3). Neither the MACEs rates (Figure 3) nor their individual components were influenced by iFR versus FFR (Table 4), with a nonsignificant *P* value for interaction.

## DISCUSSION

This substudy of the iFR-SWEDEHEART trial, which to our knowledge constitutes the largest published study to date on long-term deferral with iFR and FFR, demonstrated no statistically significant difference in long-term (5 years) clinical outcome in patients deferred from coronary revascularization based on iFR and FFR. Interestingly, there did not appear to be any differences



**Figure 2. Kaplan-Meier curve for the cumulative risk of a MACE in deferral based on iFR and FFR.**

Cumulative risk of a major adverse cardiac event at 5 years with respect to method. FFR indicates fractional flow reserve; iFR, instantaneous wave-free ratio; and MACE, major adverse cardiac event.

in long-term event rates between patients presenting with SAP compared with ACS. This suggests that iFR or FFR can be used regardless of clinical presentation. However, these results should be interpreted with caution and need further evaluation, considering the wide confidence intervals and the study being a subgroup analysis.

### Comparison With Previous Studies

Both iFR and FFR are well-recognized methods for guiding coronary revascularization in intermediate coronary artery stenoses.<sup>1</sup> FFR was the first physiology-based technique to be evaluated as a generalizable tool for guiding revascularization. In the DEFER (Deferral Versus Performance of Percutaneous Transluminal Coronary Angioplasty in Patients Without Documented Ischemia) study, 91 of 325 patients with FFR ≥0.75 were deferred from revascularization.<sup>6</sup> Follow-up for as long as 15 years has confirmed its safety.<sup>2,15</sup> Comparison of these results with those of current standard procedure

is difficult because of changes in cutoff value recommendations together with the evolution of drug-eluting stents and medical treatment. When the FAME (Fractional Flow Reserve Versus Angiography for Guiding Percutaneous Coronary Intervention) study was conducted, the cutoff value was similar to current guidelines, and drug-eluting stents were used for percutaneous coronary intervention,<sup>5</sup> making the results more comparable with our study, although guideline recommendations for use of coronary physiology-based assessment differ from when the FAME study was conducted. Of the 1005 patients included in the FAME study, 509 were assigned for treatment according to FFR values, whereas the remaining were treated based on angiography alone. At 5 years, the MACEs rate in the FFR group was 28%, similar to that of the angiography group (31%).<sup>3</sup> The MACEs rate of the current substudy is lower than that in the randomized FAME study. The difference could be partly attributed to modern stents and medical treatment in combination with a more efficient health care system. In addition, the population of the FAME study had more comorbidities, and inclusion criteria included multivessel disease. However, even taking those discrepancies into account, our lower event rates suggest that iFR and FFR could be used as reliable methods for deferral of coronary revascularization in the long term. A randomized study focusing on clinical outcome on a vessel level would be valuable to further deepen the knowledge about deferral with iFR and FFR.

The iFR-SWEDEHEART and DEFINE-FLAIR trials demonstrated the safety of coronary revascularization guided by iFR compared with FFR.<sup>7,8</sup> Its long-term safety was confirmed in the 5-year follow-up of the iFR-SWEDEHEART trial.<sup>14</sup> Both trials identified fewer hemodynamically significant stenoses with iFR and, consequently, a higher rate of deferral of revascularization with iFR. There was no significant difference in the rate of unplanned revascularization between iFR and FFR. The studies provided the opportunity to evaluate deferral of revascularization with both iFR and FFR in a large population.<sup>13</sup> The lower event rates of

**Table 2. Major Adverse Cardiac Event and Its Individual Components Relative to Deferral Based on iFR and FFR**

MACE/component	iFR, n=473	FFR, n=435	iFR vs FFR		P value
			Unadjusted HR (95% CI)	Adjusted HR (95% CI)	
MACE	18.6 (88)	16.8 (73)	1.13 (0.83–1.54)	1.08 (0.79–1.48)	0.63
All-cause death	7.6 (36)	6.7 (29)	1.14 (0.70–1.86)	1.14 (0.69–1.87)	0.62
Cardiovascular death	1.9 (9)	2.0 (9)	0.92 (0.36–2.31)	0.97 (0.38–2.49)	0.94
Noncardiovascular death	5.7 (27)	4.6 (20)	1.24 (0.70–2.22)	1.21 (0.67–2.20)	0.52
Nonfatal MI	5.3 (25)	5.5 (24)	0.97 (0.55–1.69)	0.93 (0.58–1.63)	0.80
Unplanned revascularization	9.7 (46)	9.2 (40)	1.06 (0.70–1.62)	1.03 (0.67–1.59)	0.89

Values are % (n) unless indicated otherwise. FFR indicates fractional flow reserve; HR, hazard ratio; iFR, instantaneous wave-free ratio; MACE, major adverse cardiac event; and MI, myocardial infarction.



**Table 3. Major Adverse Cardiac Event and Its Individual Components for SAP and ACS**

MACE/component	SAP, n=611	ACS, n=297	SAP vs ACS		P value
			Unadjusted HR (95% CI)	Adjusted HR (95% CI)	
MACE	16.7 (102)	19.9 (59)	0.82 (0.60–1.13)	0.85 (0.61–1.19)	0.35
All-cause death	6.7 (41)	8.1 (24)	0.82 (0.49–1.36)	0.86 (0.51–1.44)	0.57
Cardiovascular death	1.6 (10)	2.7 (8)	0.60 (0.24–1.52)	0.60 (0.23–1.57)	0.30
Noncardiovascular death	5.1 (31)	5.4 (16)	0.93 (0.51–1.70)	0.97 (0.52–1.80)	0.92
Nonfatal MI	5.2 (32)	5.7 (17)	0.91 (0.51–1.65)	0.96 (0.53–1.74)	0.89
Unplanned revascularization	9.3 (57)	9.8 (29)	0.95 (0.61–1.49)	0.96 (0.60–1.52)	0.85

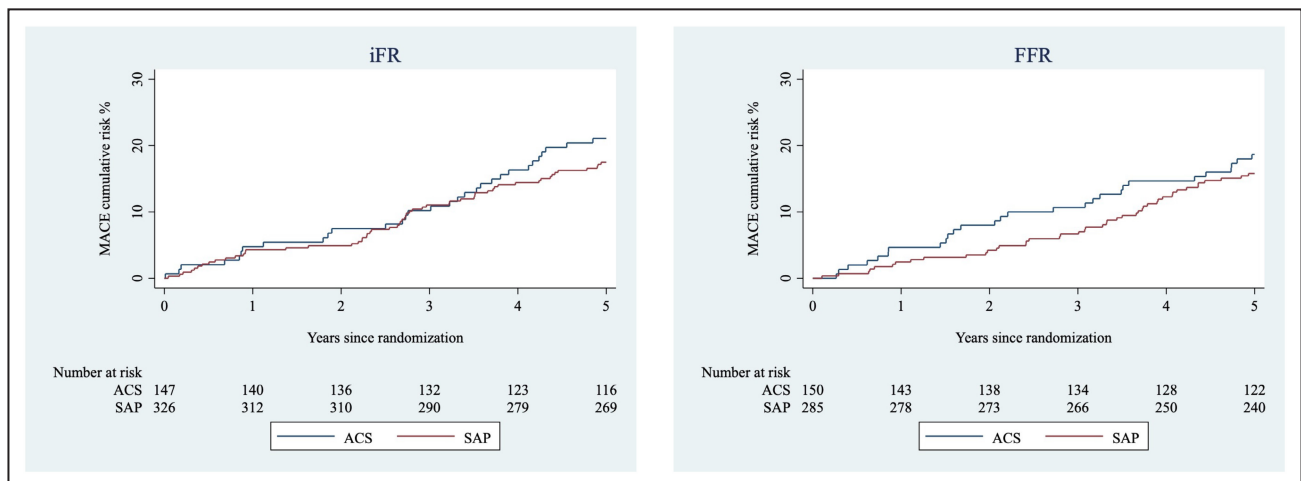
Values are % (n) unless indicated otherwise. ACS indicates acute coronary syndrome; HR, hazard ratio; MACE, major adverse cardiac event; MI, myocardial infarction; and SAP, stable angina pectoris.

approximately 4% in the pooled population of the iFR-SWEDEHEART trial and DEFINE-FLAIR trial compared with those found in the DEFER trial (8%) could reflect the evolution of coronary revascularization in combination with medical therapy. The continued monitoring of the deferred population is essential, especially when techniques such as iFR identify fewer stenoses as hemodynamically significant. In our long-term substudy follow-up of deferral from the iFR-SWEDEHEART trial, there appeared to be no difference in the rate of MACEs between the iFR and FFR groups. Thus, the favorable results seen at 1 year follow-up were preserved in this study, suggesting that there may not be a difference in clinical outcome with deferral using either iFR or FFR on a patient level. The event rate in the FFR group (16.8%) at 5 years remained lower than that reported in the DEFER trial (21%).<sup>15</sup> However, the event rate was not as low as might be expected when compared with the 2-fold difference at 1 year between the pooled population and the DEFER trial. Our study included patients presenting with SAP and ACS. Over time, patients with ACS exhibit higher cardiovascular

risk potentially influencing the results. The patients in our study were older than the patients in the DEFER study, which may explain the relatively higher rate of noncardiovascular deaths.

### Deferral of Revascularization Relative to Clinical Presentation

The use of FFR to guide coronary revascularization in patients with SAP is well established and considered safe.<sup>4,5</sup> Reports of its safety in patients presenting with ACS are inconsistent. Two randomized clinical trials evaluating patients presenting with ST-segment-elevation myocardial infarction showed that FFR-guided complete revascularization of nonculprit lesions to reduce the risk of a composite cardiovascular outcome was mainly driven by revascularization.<sup>16,17</sup> The primary concern of using FFR in patients with ACS is that microvascular circulation is disturbed in the acute phase; however, studies support the use of FFR in this situation in nonculprit lesions.<sup>18</sup> A limitation to those studies is that they focused on patients presenting



**Figure 3. Kaplan-Meier curve for the cumulative risk of a MACE by clinical presentation with respect to method.** The cumulative risk of major adverse cardiac event at 5 years relative to clinical presentation (SAP and ACS) deferred based on iFR (left) and FFR (right). ACS indicates acute coronary syndrome; FFR, fractional flow reserve; iFR, instantaneous wave-free ratio; MACE, major adverse cardiac event; and SAP, stable angina pectoris.

**Table 4. Outcomes According to Clinical Presentation and Physiology-Based Technique**

Outcome	SAP, n=611	ACS, n=297	SAP vs ACS unadjusted HR (95% CI)	P value	Interaction P value
MACE	16.7 (102)	19.9 (59)	0.82 (0.60–1.13)	0.23	
iFR	17.5 (57)	21.1 (31)	0.82 (0.53–1.27)		0.99
FFR	15.8 (45)	18.7 (28)	0.82 (0.51–1.31)		
All-cause death	6.7 (41)	8.1 (24)	0.82 (0.49–1.36)	0.44	
iFR	7.7 (25)	7.5 (11)	1.03 (0.51–2.10)		0.34
FFR	5.6 (16)	8.7 (13)	0.63 (0.30–1.30)		
Cardiovascular death	1.6 (10)	2.7 (8)	0.60 (0.24–1.52)	0.28	
iFR	1.8 (6)	2.0 (3)	0.91 (0.23–3.63)		0.41
FFR	1.4 (4)	3.3 (5)	0.41 (0.11–1.52)		
Noncardiovascular death	5.1 (31)	5.4 (16)	0.93 (0.51–1.70)	0.81	
iFR	5.8 (19)	5.4 (8)	1.08 (0.47–2.46)		0.58
FFR	4.2 (12)	5.3 (8)	0.76 (0.31–1.87)		
Nonfatal MI	5.2 (32)	5.7 (17)	0.91 (0.51–1.65)	0.77	
iFR	5.2 (17)	5.4 (8)	0.96 (0.41–2.22)		0.88
FFR	5.3 (15)	6.0 (9)	0.88 (0.38–2.0)		
Unplanned revascularization	9.3 (57)	9.8 (29)	0.95 (0.61–1.49)	0.84	
iFR	9.2 (30)	10.9 (16)	0.84 (0.46–1.54)		0.56
FFR	9.8 (27)	8.7 (13)	1.10 (0.57–2.13)		

Values are % (n) unless indicated otherwise. ACS indicates acute coronary syndrome; FFR, fractional flow reserve; HR, hazard ratio; iFR, instantaneous wave-free ratio; MACE, major adverse cardiac event; MI, myocardial infarction; and SAP, stable angina pectoris.

with ACS and did not compare results with patients presenting with SAP.

In the pooled analysis of the iFR-SWEDEHEART and DEFINE-FLAIR trials with patients deferred from revascularization with iFR and FFR, the 1-year rate of MACEs was significantly higher in patients presenting with ACS compared with patients with SAP.<sup>13</sup> These results are in agreement with other studies demonstrating that FFR-guided revascularization is associated with a higher rate of MACEs in patients with ACS compared with those with SAP.<sup>19–21</sup> However, on the matter of deferral, the present study found no significant difference in MACE or its individual components after 5 years when patients were deferred with iFR and FFR, regardless of clinical presentation. These results should be interpreted with caution because of the substudy design of the trial, this being a subgroup analysis within a substudy, and the wide range of confidence intervals. Further investigations are needed in this field also focusing on clinical presentation on a vessel level.

### Limitations

This was a substudy of the randomized iFR-SWEDEHEART trial, where patients deferred from iFR and FFR were followed over time. The results were fully adjusted for baseline characteristics. However, the observational nature of this post hoc study means that residual confounding cannot be ruled out. The

iFR-SWEDEHEART trial was not powered for this specific subgroup analysis with a risk for type I error. There is a possibility for a concealed difference in clinical presentation given the wide confidence intervals and this being a subgroup analysis within a substudy. The end point of MACEs was not specified on a vessel level, and we could not differentiate between target and nontarget vessel outcomes. Therefore, the clinical outcome could potentially be driven by new events that were not related to the deferred lesion.

## CONCLUSIONS

No differences in clinical outcomes after 5 years were noted when comparing iFR versus FFR as methods for deferral of coronary revascularization in patients presenting with SAP and ACS.

## ARTICLE INFORMATION

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## Disclosures

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