

FFR IFR QFR:

**ARE ALL THE INDICES THE SAME OR
IS THERE ANY PREFERENCE?**

DR BINOY JOHN

MD DM (CARDIOLOGY) FCSI FACC FESC FSCAI FAPSIC

DIRECTOR & HEAD: DEPT OF CARDIOLOGY & INTERVENTIONAL CARDIOLOGY

RELA INSTITUTE

CHENNAI, INDIA

HAVE **NO** DISCLOSURES TO MAKE

FUNCTIONAL EVALUATION IS CURRENTLY THE ESTABLISHED DIAGNOSTIC STANDARD FOR THE ASSESSMENT OF INTERMEDIATE CORONARY ARTERY STENOSIS IN STABLE CAD.

THE MODALITIES AVAILABLE ARE:

A. INVASIVE AND HYPEREMIC INDEX

1. FRACTIONAL FLOW RESERVE (FFR)

B. INVASIVE NON HYPEREMIC INDICES (NON HYPEREMIC PRESSURE RATIO: NHPR):

2. INSTANTANEOUS WAVE FREE RATIO (iFR)

3. RESTING FULL CYCLE RATIO (RFR)

C. NON-INVASIVE AND NON HYPEREMIC INDEX:

4. QUANTITATIVE FLOW RATIO (QFR)

FRACTIONAL FLOW RESERVE (FFR)

FFR

BY DEFINITION IS A HYPEREMIC INDEX.

FFR IS THE RATIO OF THE DISTAL PRESSURE (P_D) MEASURED BY THE FFR SENSOR WIRE PLACED DISTAL TO THE STENOSIS AND THE PROXIMAL PRESSURE (P_A) TAKEN FROM THE GUIDING CATHETER.

$$\text{THUS } \text{FFR} = P_D / P_A.$$



FFR IS CURRENTLY THE GOLD STANDARD AND A CLASS I LOE A RECOMMENDATION IN GUIDELINES

FAME 2 STUDY:

A FFR > 0.80 INDICATES THAT THE PATIENTS CAN BE MANAGED SAFELY WITH MEDICAL THERAPY ALONE AND WITHOUT CORONARY REVASCULARIZATION.

AND 0.8 OR LESS HAD TO BE INTERVENED

CONS OF FFR:

NEEDED HYPEREMIC AGENTS: ADENOSINE

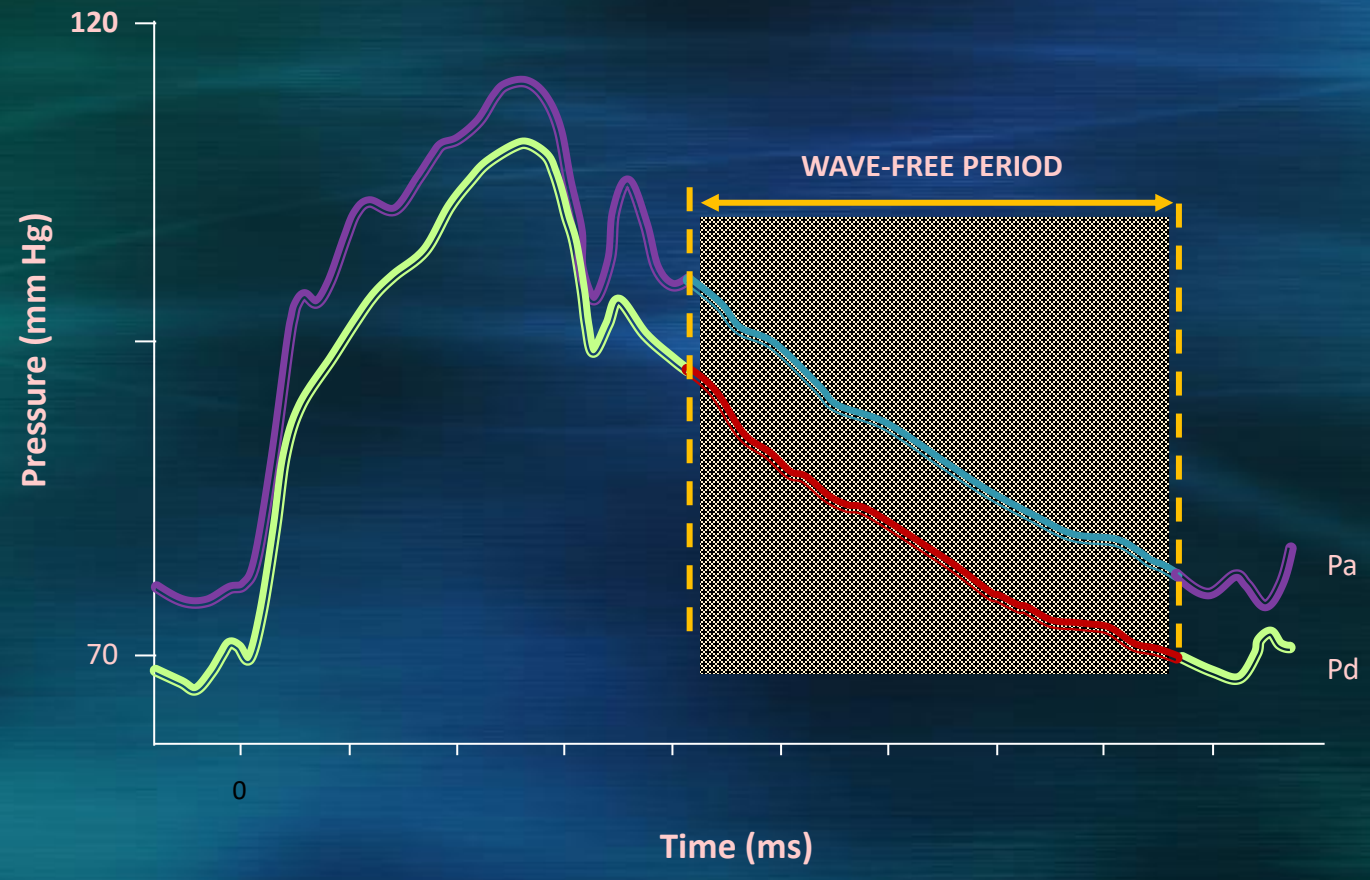
ADENOSINE CONTRAINDICATED IN COPD AND ASTHMA

INVASIVE

NON-HYPEREMIC TESTS/ NON-HYPEREMIC PRESSURE RATIOS (NHPR)

- 1. IFR: INSTANTANEOUS WAVE FREE RATIO**
- 2. RFR: RESTING FULL CYCLE RATIO**

IFR: INSTANTANEOUS WAVE FREE RATIO



IFR

VALIDATED IN:

1. DEFINE-FLAIR STUDY
2. IFR-SWEDEHEART STUDY

NO DIFFERENCE IN UNPLANNED REVASCULARIZATION BETWEEN FFR AND IFR AT 1 YEAR IN MEDICALLY TREATED PATIENTS

THE ESC GUIDELINES 2018 BASED ON THESE TWO LARGE RANDOMIZED CLINICAL TRIALS IN 2017 FROM THE DEFINE FLAIR TRIAL AND IFR-SWEDEHEART TRIAL

Recommendations	Class ^a	Level ^b
When evidence of ischaemia is not available, FFR or iwFR are recommended to assess the haemodynamic relevance of intermediate-grade stenosis. ^{15,17,18,39}	I	A
FFR-guided PCI should be considered in patients with multivessel disease undergoing PCI. ^{29,31}	IIa	B

2021 REVASCULARIZATION GUIDELINES

Recommendations for the Use of Coronary Physiology to Guide Revascularization With PCI

Referenced studies that support the recommendations are summarized in [Online Data Supplement 5](#).

COR	LOE	Recommendations
1	A	1. In patients with angina or an anginal equivalent, undocumented ischemia, and angiographically intermediate stenoses, the use of fractional flow reserve (FFR) or instantaneous wave-free ratio (iFR) is recommended to guide the decision to proceed with PCI. ¹⁻⁶
3: No benefit	B-R	2. In stable patients with angiographically intermediate stenoses and FFR >0.80 or iFR >0.89, PCI should not be performed. ⁷⁻¹⁰

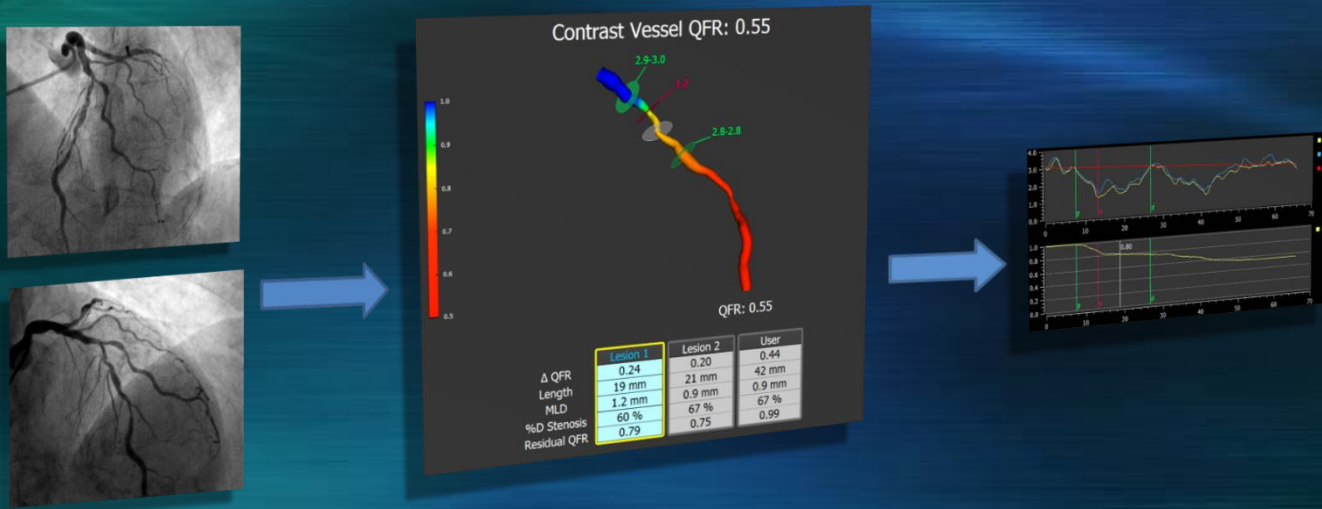
QUANTITATIVE FLOW RATIO (QFR)

QUANTITATIVE FLOW RATIO (QFR)

IS A NEWER DIAGNOSTIC MODALITY FOR FUNCTIONAL TESTING OF CORONARY ARTERY STENOSIS:

1. WITHOUT THE USE OF PRESSURE WIRES
2. WITHOUT THE NEED FOR INDUCING HYPEREMIA

**QFR-3D MODEL IS RECONSTRUCTED FROM
2 ANGIOGRAPHIC PROJECTIONS
WITH ANGLES $\geq 25^\circ$ APART
ACQUIRED BY MONOPLANE OR BIPLANE SYSTEMS.
PATIENT-SPECIFIC VOLUMETRIC FLOW RATE (AT HYPERAEMIA) IS CALCULATED
USING THE COMBINATION OF CONTRAST BOLUS FROM FRAME COUNT AND 3D
QCA**



IN-PROCEDURE TIME: <5 MIN

THE PROMINENT QFR TRIALS (2023) ARE:

- 1. FAVOR III CHINA**
- 2. AQVA TRIAL**
- 3. FIRE TRIAL**

COMPARISONS OF QFR WERE WITH ANGIOGRAPHY

**FAVOR III China
QFR VS ANGIOGRAPHIC INTERPRETATION**

**3800 PATIENTS;
SOFTWARE IS BASED ON THE MEDIS QFR[®] ALGORITHMS**

**MAIN RESULTS:
2-YEAR MACE OCCURRED IN 8.5% IN THE QFR-GUIDED GROUP AND
12.5% IN THE ANGIOGRAPHY-GUIDED GROUP;
A 32% DECREASE**

AQVA II TRIAL

(N=300 PATIENTS, 356 STUDY VESSELS)

THE VIRTUAL PCI-PLAN APPLICATION (MEDIS QFR) WAS ABLE TO SIGNIFICANTLY REDUCE THE NUMBER OF VESSELS WITH SUBOPTIMAL POST-PCI PHYSIOLOGY (POST-PCI QFR < 0.90) COMPARED WITH ANGIOGRAPHY-GUIDED PCI

IN THOSE PATIENTS WITH SUBOPTIMAL POST-PCI PHYSIOLOGY, THE RESIDUAL PATTERN OF DISEASE WAS MAINLY DIFFUSE IN THE QFR-GUIDED GROUP WHEREAS IT WAS MAINLY FOCAL IN THE ANGIOGRAPHY-GUIDED ONE

MAIN RESULTS: THE AQVA TRIAL DEMONSTRATED THE SUPERIORITY OF A QFR-BASED VIRTUAL PCI PLAN VERSUS A CONVENTIONAL ANGIO-BASED APPROACH WITH REGARD TO POST-PCI OPTIMAL PHYSIOLOGICAL RESULTS

Published JACC Intv 2023; 16: 783-794; *S. Biscaglia et al.,*

QFR LIMITATION:

- 1. NEEDS ADEQUATE PROJECTIONS WITH GOOD VESSEL OPACIFICATION**
- 2. CANNOT BE USED IN OSTIAL AND LEFT MAIN LESIONS, MAJOR BIFURCATIONS AND MYOCARDIAL BRIDGES**
- 3. USE OF NITRATES ARE REQUIRED AS IT IS ANGIOGRAPHICALLY DERIVED**
- 4. NEEDS PROPRIETARY SOFTWARE**
- 5. MANUAL VESSEL CONTOURING MAY BE NEEDED**

1. IN SERIAL AND DIFFUSE LESIONS

ASSESSMENT OF SERIAL AND DIFFUSE LESIONS CAN BE A CHALLENGE.

TECHNIQUE:

1. FFR IS PERFORMED IN THE STANDARD MANNER PAST THE DISTAL MOST STENOSIS
2. MEASURE THE FFR OF ALL STENOSES TOGETHER **UNDER MAXIMAL HYPEREMIA**
3. IF FFR IS > 0.80 DEFER PCI AND TREAT WITH OMT
4. IF FFR IS SIGNIFICANT: IE ≤ 0.80 PERFORM A MANUAL PULL BACK PRESSURE TRACING **UNDER MAXIMAL HYPEREMIA**
5. PERFORM PCI IN THE LESION WITH THE LARGEST PRESSURE STEP UP FIRST.

CAUTION: DO NOT MISS ANATOMICAL CONSIDERATIONS AROUND THE TARGET LESION

2. IN ACUTE CORONARY SYNDROMES

USE OF PHYSIOLOGIC INDICES WERE VALIDATED INITIALLY IN **CHRONIC** CORONARY SYNDROMES

BUT INTERPRETATION OF THESE INDICES IN ACUTE CORONARY SYNDROMES NEED CAUTION AS FFR IS A TEST THAT IS DEPENDENT ON MAXIMAL HYPEREMIA OF THE CORONARY MICRO-CIRCULATION.

WHEN ACUTE MICRO-VASCULAR CONGESTION OCCURS IN ACS, IT CAN RESULT IN A REDUCTION IN THE DEGREE OF INDUCIBLE HYPEREMIA, RESULTING IN A **HIGHER FFR VALUE** AND THUS AN UNDERESTIMATION OF A STENOSIS.

ACS IN CLINICAL PRACTICE INCLUDES FIVE SCENARIOS:

1. STEMI WITH DISEASE **ONLY** IN INFARCT RELATED ARTERY (IRA)
2. STEMI WITH **MULTI VESSEL DISEASE** (MVD)
3. NSTEMI WITH **UNCLEAR** CULPRIT LESION AND MVD
4. NSTEMI WITH MVD AND **WELL DEFINED CULPRIT LESION**
5. MINOCA (MI WITH NON-OBSTRUCTIVE CAD)

IN ACS FFR CAN BE FALSE NEGATIVE:

- 1. IN PRESENCE OF SIGNIFICANT MICROVASCULAR DYSFUNCTION.**
- 2. SEVERE HYPOTENSION: DUE TO INADEQUATE FLOW DUE TO LOW PRESSURE GRADIENT**

THE IMPACT OF THE MICROVASCULAR DYSFUNCTION IS SIGNIFICANT AND UNDOUBTED IN THE AREA PERFUSED BY THE CULPRIT ARTERY, BUT IN AREAS REMOTE FROM THE INFARCT ZONE, THE DYSFUNCTION IS PRESENT, BUT MAY NOT BE AS SIGNIFICANT.

1. STEMI WITH DISEASE ONLY IN IRA

**IN STEMI NEEDING PPCI THE IRA CAN BE EASILY IDENTIFIED AND
PHYSIOLOGIC GUIDANCE IS NOT NEEDED.**

2. STEMI WITH MVD

MORE THAN 50% OF PATIENTS PRESENTING WITH STEMI HAVE MVD

THE COMPLETE VS CULPRIT-ONLY REVASCULARIZATION TO TREAT MULTI-VESSEL DISEASE AFTER EARLY PCI FOR STEMI (**COMPLETE**) TRIAL DEMONSTRATED A SIGNIFICANT BENEFIT IN TERMS OF CARDIOVASCULAR DEATH AND MI IN A LARGE POPULATION OF STEMI PATIENTS WHO UNDERWENT **COMPLETE REVASCULARISATION** (HR 0.74; 95% CI [0.60–0.91]; P=0.004) VS **CULPRIT ONLY**.

HOWEVER, THE FUNCTIONAL ASSESSMENT OF NON-CULPRIT LESIONS WAS INITIALLY QUESTIONED BECAUSE OF CONCERNS RELATED TO THE STATUS OF THE MICROVASCULATURE IN REMOTE MYOCARDIAL TERRITORIES

COMPARE-ACUTE (FFR OF NON CULPRIT ARTERY IN STEMI)

885 PATIENTS

STUDY POPULATION: STEMI

MAIN FINDING: FFR-GUIDED COMPLETE REVASCULARISATION (**ASSESSMENT DURING PPCI**) REDUCES THE COMPOSITE OF CARDIAC DEATH, MI AND ISCHEMIA-DRIVEN REVASCULARISATION AT 12 MONTHS (HR 0.35; 95% CI [0.22–0.55]; $P < 0.001$)

DANAMI-3-PRIMULTI (FFR OF NON CULPRIT ARTERY IN STEMI)

627 PATIENTS

STUDY POPULATION: STEMI

MAIN FINDING: **FFR-GUIDED** COMPLETE REVASCULARISATION (**ASSESSMENT BEFORE DISCHARGE**) REDUCES THE COMPOSITE OF CARDIAC DEATH, MI AND ISCHAEMIA-DRIVEN REVASCULARISATION AT 27 MONTHS (HR 0.56; 95% CI [0.38–0.83]; $P = 0.004$)

BOTH TRIALS DEMONSTRATED THE SUPERIORITY OF FFR-GUIDED COMPLETE REVASCULARISATION COMPARED WITH THE CULPRIT-ONLY APPROACH

NTALIANIS ET AL

101 PATIENTS, 112 LESIONS

STUDY POPULATION: STEMI AND NSTEMI-ACS

IN THAT STUDY, THERE WAS NO OVERALL SIGNIFICANT DIFFERENCE IN FFR VALUES AT FOLLOW-UP (WITH FOLLOW UP TIME RANGING FROM 4 TO 128 DAYS) COMPARED WITH THE ACUTE PHASE.

3. NSTEMI-ACS WITH CLEAR CULPRIT LESION AND MULTIVESSEL DISEASE

IN PRESENCE OF A CLEAR INFARCT-RELATED LESION AND MVD, THE SAME INFORMATION REPORTED FOR THE STEMI NON-CULPRIT LESIONS CAN BE APPLIED TO NSTEMI-ACS PATIENTS.

BOTH FFR AND IFR HAVE BEEN USED IN THIS SETTING WITH FAVOURABLE OUTCOMES AND SHOULD BE CONSIDERED IN THE PRESENCE OF ANGIOGRAPHIC INTERMEDIATE LESIONS

FAMOUS-NSTEMI TRIAL

THE FRACTIONAL FLOW RESERVE VERSUS ANGIOGRAPHY IN GUIDING MANAGEMENT OF OPTIMIZE OUTCOMES IN NON-ST-ELEVATION MYOCARDIAL INFARCTION TRIAL DEMONSTRATED THE SAFETY AND FEASIBILITY OF FFR MEASUREMENTS IN NSTEMI.

AN INTERESTING FAMOUS-NSTEMI **SUBSTUDY DEMONSTRATED THAT:**

FFR HAS A 92% DIAGNOSTIC ACCURACY

POSITIVE PREDICTIVE VALUE 76%,

NEGATIVE PREDICTIVE VALUE 97%

IN DETECTING SIGNIFICANT PERFUSION ABNORMALITIES IN MATCHED TERRITORIES WITH **STRESS CMR (AUC 0.93; 95% CI [0.90–0.99]).**

4. NSTEMI-ACS WITH AMBIGUOUS CULPRIT LESION AND MULTIVESSEL DISEASE

WHEN THE IRA IN NSTEMI-ACS IS AMBIGUOUS AND THERE IS **UNCERTAINTY REGARDING THE IRA** IN THE SETTING OF NSTEMI-ACS:

INTRACORONARY IMAGING WITH **OCT/IVUS** SHOULD BE INTEGRATED WITH PHYSIOLOGY TO DETECT THE PRESENCE OF ACS CHARACTERISTICS LIKE:

PLAQUE RUPTURE, EROSION OR INTRACORONARY THROMBUS TO GUIDE REVASCULARISATION

IMAGING SHOULD STILL BE CONSIDERED EVEN IF FFR/IFR ARE BORDERLINE OR NEGATIVE.

3. BIFURCATION LESIONS AND JAILED SIDE BRANCHES

THERE IS A PAUCITY OF STUDIES EVALUATING BIFURCATION LESIONS WITH INVASIVE PHYSIOLOGY OR FCA.

IT'S KNOWN THAT A CONVENTIONAL ANGIOGRAPHY, OFTEN OVERESTIMATES THE SEVERITY OF SIDE BRANCH LESION.

PHYSIOLOGIC ASSESSMENT OF BIFURCATION ANATOMY MAY FURTHER ASSIST PCI STRATEGY AND INDICATE THE NECESSITY OF ADOPTING A NON-PROVISIONAL STRATEGY IN SOME INSTANCES.

COMPARED WITH AN **ANGIOGRAPHY-GUIDED** APPROACH,
AN **FFR-GUIDED PCI** STRATEGY IN BIFURCATION PCI PROVIDED SIMILAR
RATES OF FUNCTIONALLY ADEQUATE REVASCULARISATION WITH **LESS**
STENT IMPLANTATION AND WAS ASSOCIATED WITH NUMERICALLY
LOWER RATES OF TVF AND STENT THROMBOSIS.

**IN THE DK-CRUSH-VI STUDY:
PATIENTS WERE RANDOMLY ASSIGNED TO
FFR OR ANGIOGRAPHY GUIDED SB-PCI**

**THIS LED TO FEWER STENTS
25.9% BEING PLACED IN THE FFR ARM VERSUS
38.1% IN THE ANGIOGRAPHY ARM, $P=0.01$**

**LESS MAIN BRANCH (MB) RESTENOSIS WAS SEEN IN THE PHYSIOLOGY
GUIDED GROUP (1.2% VERSUS 9.2%, $P=0.01$) AND**

RECENT WORK HAS ALSO SUPPORTED THE USE OF **JAILED PRESSURE GUIDEWIRES** FOR CONTINUOUS SB MONITORING WHICH SEEMS SAFE AND FEASIBLE, EVEN WITH HIGH-PRESSURE MB INFLATIONS USING NON-COMPLIANT BALLOONS, HOWEVER LARGE PROSPECTIVE STUDIES ARE LACKING.

4. LEFT MAIN STENOSIS

SAFETY OF DEFERRAL OF REVASCULARISATION IN LEFT MAIN STEM (LMS) STENOSIS WHEN FFR OR IFR VALUES ARE NEGATIVE HAS BEEN REPORTED.

HOWEVER, IT IS IMPORTANT TO NOTE THAT: WHEN LMS STENOSIS WAS **<50%, 23% CASES WERE** ASSOCIATED WITH POSITIVE FFR VALUES (<0.80)

WHILST THE PRESENCE OF A SIGNIFICANT LMS STENOSIS ($>50\%$) WAS RARELY (6% OF THE CASES) ASSOCIATED WITH NEGATIVE FFR VALUES.

AVOIDANCE OF TECHNICAL PITFALLS FOR WIRE-BASED INTERROGATION IN THIS LOCATION IS PARTICULARLY IMPORTANT:

OVERALL, **THE EFFECT OF DOWNSTREAM STENOSIS** ON FFR ASSESSMENT OF LMS DISEASE HAS BEEN REPORTED **TO BE SMALL**, UNLESS THE DOWNSTREAM STENOSIS IS **PROXIMAL AND VERY SEVERE**.

LONGITUDINAL VESSEL ANALYSIS MAY PROVIDE A RICHER PICTURE OF THE INDIVIDUAL CONTRIBUTION OF LMS AND DOWNSTREAM STENOSES.

LIKEWISE, NO STUDIES ON PHYSIOLOGICAL OPTIMISATION OF LMS PCI ARE CURRENTLY AVAILABLE.

5. CORONARY LESIONS IN PATIENTS WITH AORTIC STENOSIS

THE MAIN CHALLENGE WHEN ASSESSING THE FUNCTIONAL RELEVANCE OF CORONARY STENOSES PRIOR TO AORTIC VALVE REPLACEMENT IS THAT THE BOUNDARY OF HAEMODYNAMIC AND MICROVASCULAR CONDITIONS WILL SHIFT AFTER THE INTERVENTION ON THE AORTIC VALVE BE IT TAVR OR SAVR.

THUS, THERE IS UNCERTAINTY REGARDING WHETHER INTRACORONARY MEASUREMENTS MADE AS PART OF DIAGNOSTIC WORK-UP OF AS RELIABLY PREDICTS STENOSIS RELEVANCE ONCE SUCH BOUNDARY CONDITIONS HAVE BEEN MODIFIED BY TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI) OR SURGICAL AORTIC VALVE REPLACEMENT, OR WHETHER INTRACORONARY INDICES ARE EQUALLY AFFECTED BY CHANGES IN CARDIAC PHYSIOLOGY.

ONE STUDY HAS REPORTED THAT BOTH IFR AND FFR CORRELATE WELL WITH ISCHAEMIA DEMONSTRATED WITH SINGLE-PHOTON EMISSION COMPUTERISED TOMOGRAPHY (SPECT) IMAGING

NON-HYPERAEMIC INDICES SUCH AS IFR DO NOT RELY ON THE EFFECT OF ADENOSINE, YET SINCE BASAL CORONARY FLOW MAY BE INCREASED IN AS, NHPR INDICES MIGHT OVERESTIMATE STENOSIS SEVERITY.

THE USE OF FUNCTIONAL ANGIOGRAPHY HAS BEEN EXPLORED IN THESE PATIENTS USING FFR OBTAINED AT BASELINE OR AFTER TAVI AS A COMPARATOR, REPORTING A GOOD DIAGNOSTIC YIELD OF QFR.

IFR-SWEDE HEART: 5 YEAR OUTCOMES

AT 5 YEARS, IN PATIENTS WITH CHRONIC OR ACUTE CORONARY SYNDROMES, AN IFR GUIDED REVASCULARIZATION STRATEGY WAS ASSOCIATED WITH **NO DIFFERENCE** IN THE COMPOSITE OUTCOME OF DEATH, MI, UNPLANNED REVASCULARIZATION COMPARED WITH AN FFR GUIDED REVASCULARIZATION STRATEGY. (JACC 2022)

DEFINE FLAIR 5 YEAR RESULTS

INTERPRETATION

NO SIGNIFICANT DIFFERENCE WAS FOUND IN THE 5-YEAR FOLLOW-UP OF PATIENTS WHO DID NOT UNDERGO CORONARY REVASCULARIZATION AFTER FFR OR IFR. **EXCEPT FOR THE SECONDARY ENDPOINT OF MORTALITY.**

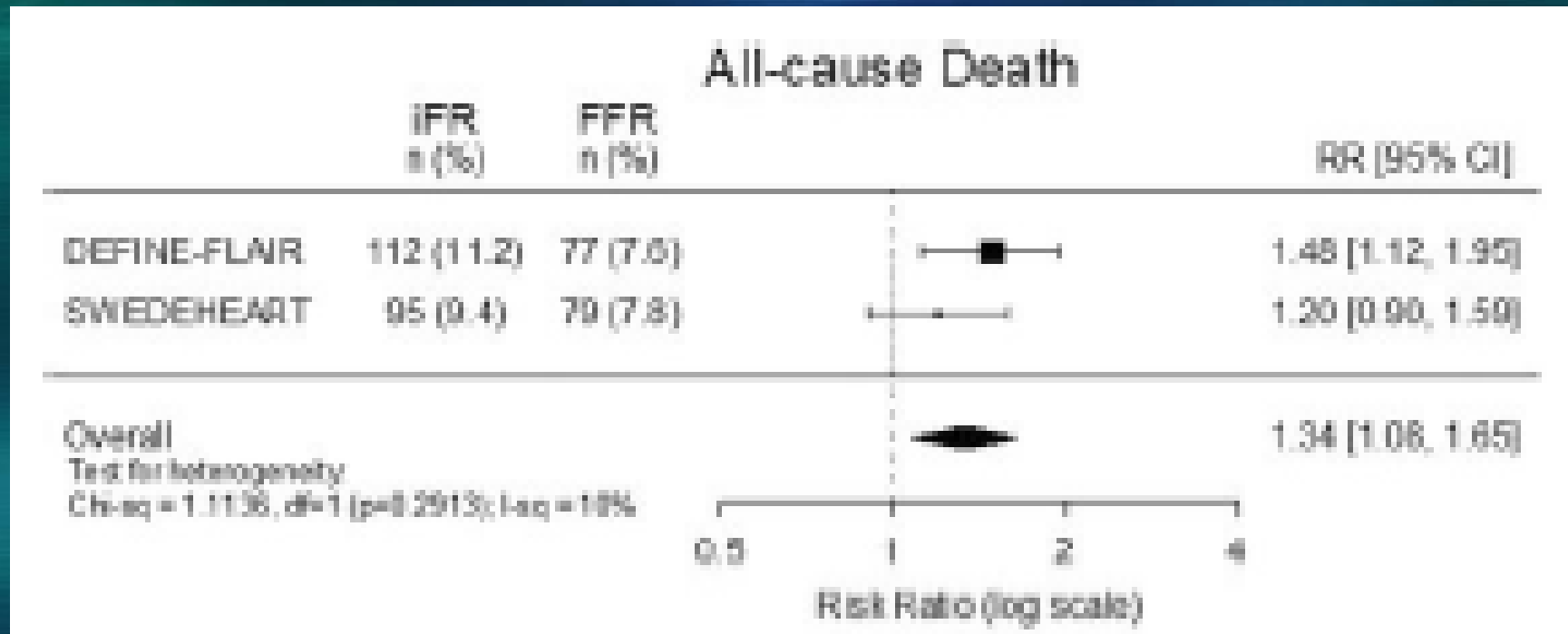
ALL-CAUSE OF MORTALITY WAS OBSERVED MORE FREQUENTLY IN THE IFR ARM (IFR 9% VS FFR 6.2% P:0.01).

HOWEVER A 2023 **META-ANALYSIS OF THE POOLED DATA**
OF DEFINE FLAIR AND SWEDE HEART OF
TOTAL 4345 PARTICIPANTS SHOWED
A TOTAL OF 160 DEATHS OR MI EVENTS OCCURRED
OF THIS **90** WERE IN THE **IFR GROUP** (n = 2159) AND
70 IN THE **FFR GROUP** (n= 2186).

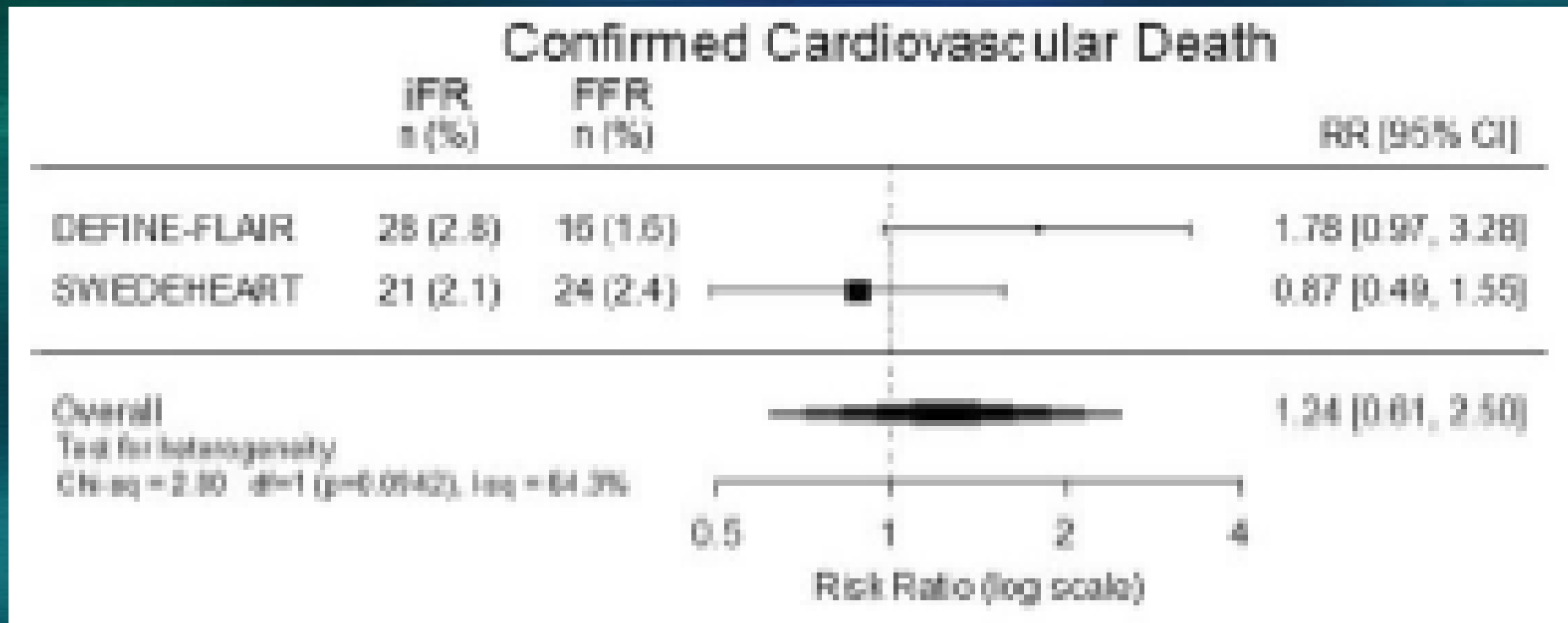
ALSO AT 2 YEARS THE HR FOR MORTALITY WAS 2XS HIGHER IN THE IFR
(2.02 (1.24, 3.31; P-0.01)

IN THE COMBINED TRIALS AFTER A FOLLOW UP PERIOD OF 5 YEARS, IFR GUIDED MANAGEMENT WAS ASSOCIATED WITH A SIGNIFICANT EXCESS OF DEATH WITH A RISK RATIO OF 1.34 (95% CI 1.08, 1.65. $p = 0.007$)

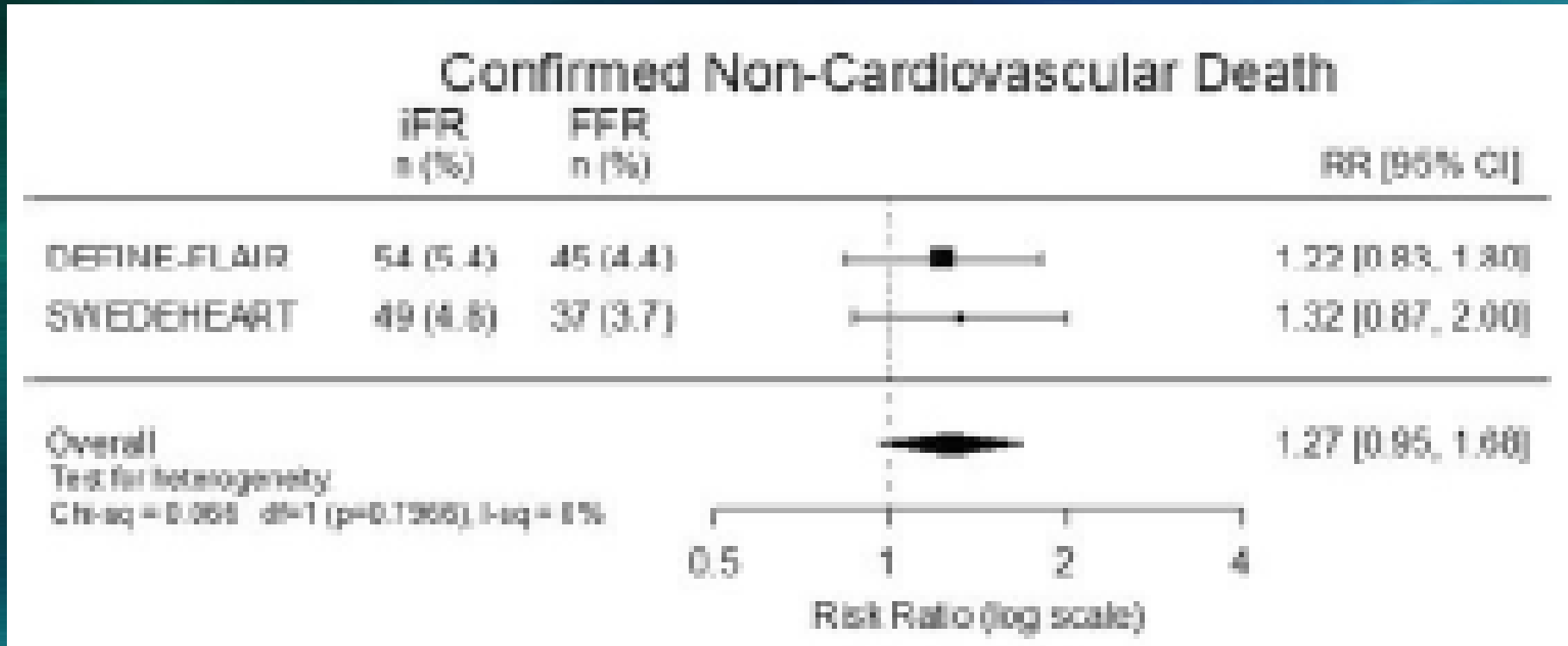
THERE WAS **DIRECTIONAL CONSISTENCY** FOR THE EXCESS OF DEATHS IN THE IFR GROUPS IN BOTH THE TRIALS



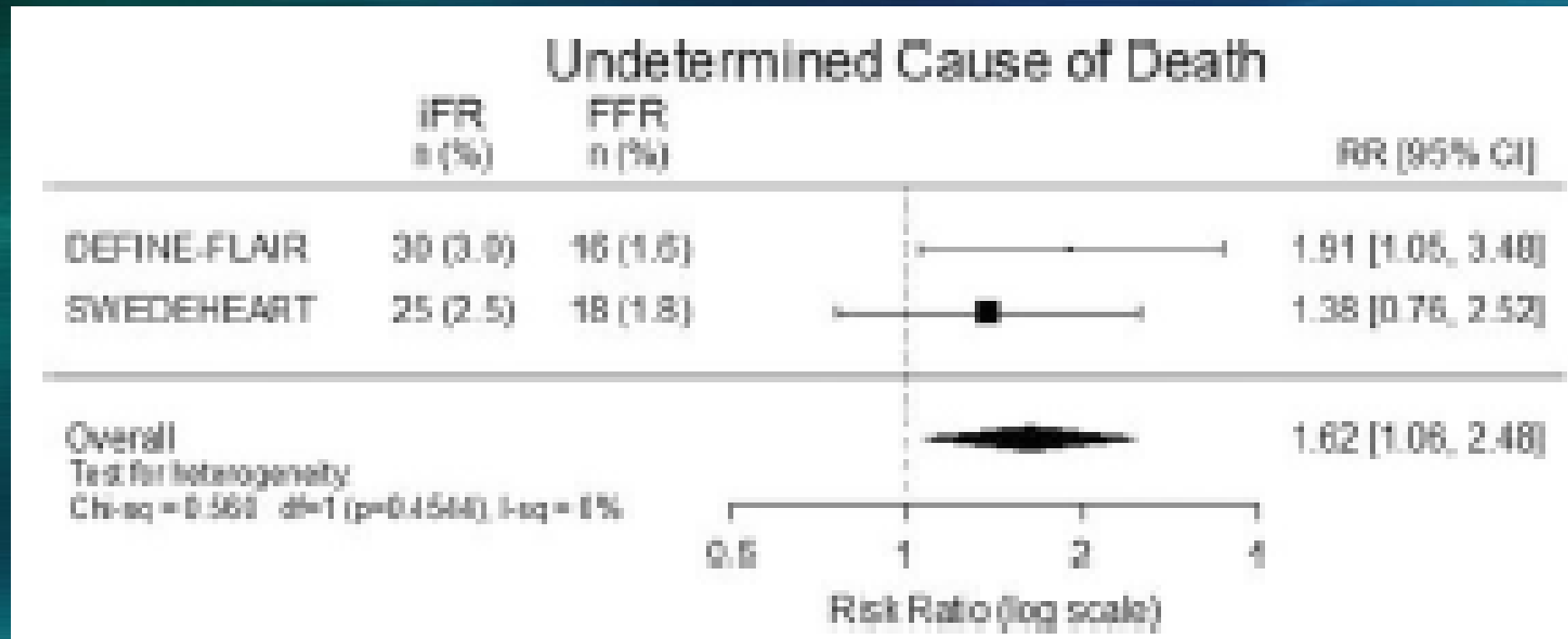
CONSIDERING THE SUB GROUPS OF DEATH BY CAUSE IN RELATION TO RISK RATIOS (95% CI) THERE WAS ALSO **DIRECTIONAL CONSISTENCY** IN THE INCREASED RISK OF CARDIOVASCULAR DEATH (1.24 (0.61, 2.50) $p = 0.551$)



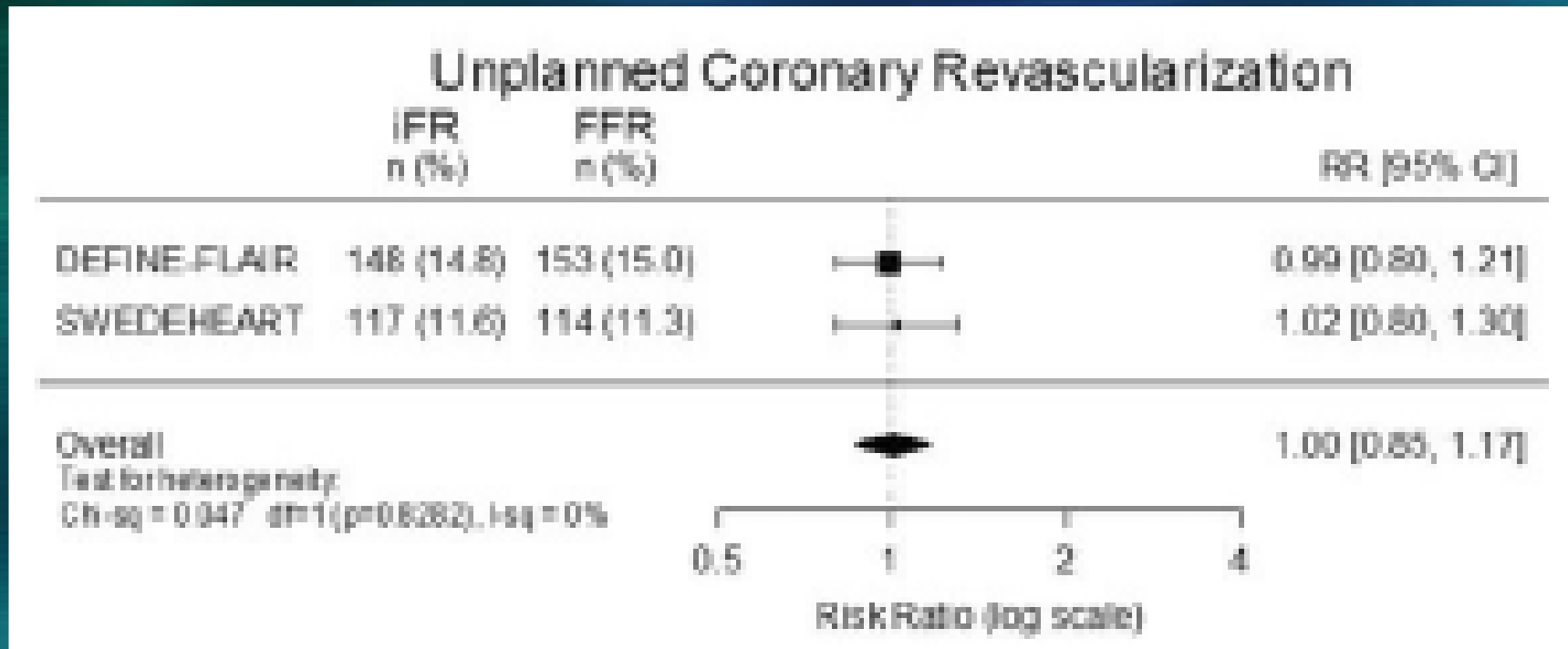
THERE WAS ALSO **DIRECTIONAL CONSISTENCY** IN CONFIRMED NON CARDIOVASCULAR DEATH (1.27 (0.95, 1.68); p = 0.103)



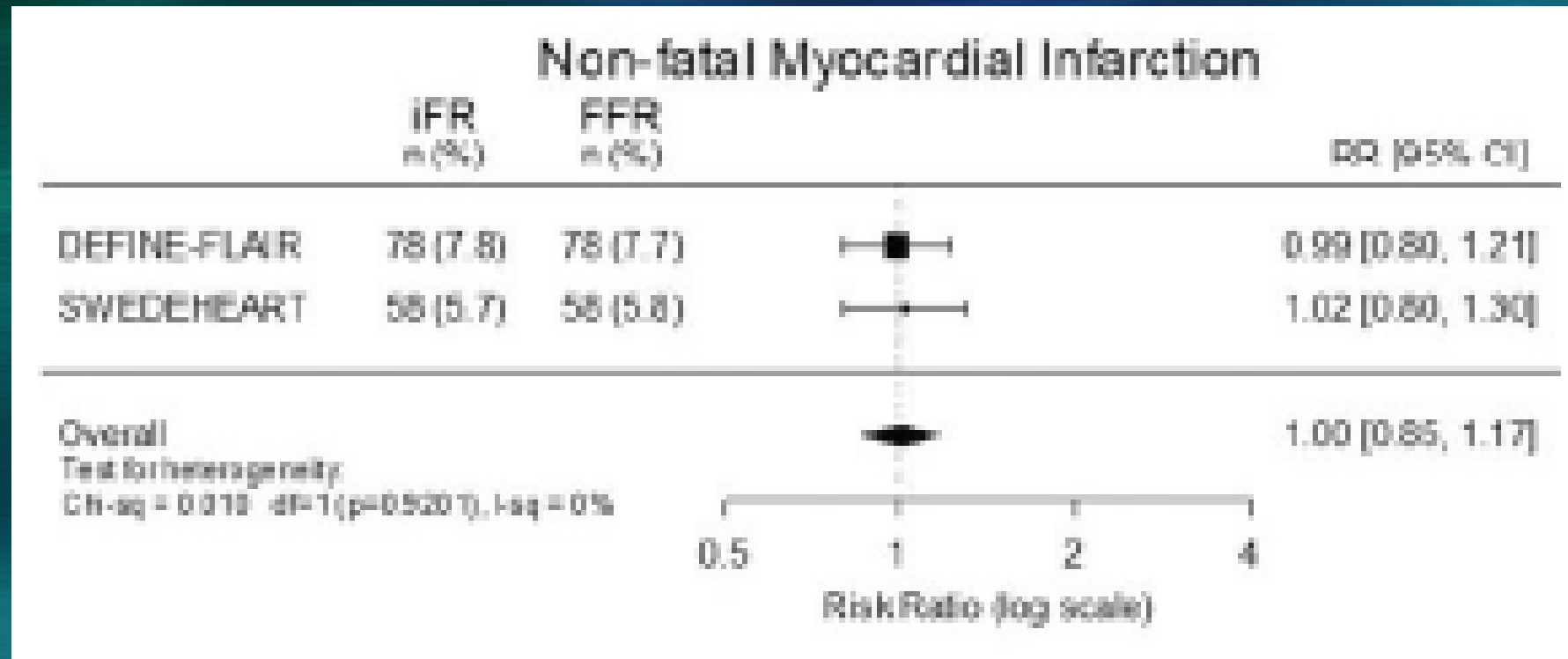
**AND UNDETERMINED CAUSE OF DEATH (1.62 (1.06, 2.48); p= 0.025)
WAS STATISTICALLY SIGNIFICANT**



HOWEVER THERE WERE NO DIFFERENCES BETWEEN GROUPS IN THE PROPORTIONS OF PATIENTS WITH: UNPLANNED CORONARY REVASCULARIZATION



THERE WERE NO DIFFERENCES BETWEEN GROUPS IN THE PROPORTION OF PATIENTS WITH: NON-FATAL MYOCARDIAL INFARCTION.



THUS IN CONCLUSION:

COMPARED WITH FFR GUIDED MANAGEMENT, IFR GUIDED MANAGEMENT WAS ASSOCIATED WITH AN INCREASED RISK OF DEATH AT 5 YEARS.

THESE NEW RESULTS ARE RELEVANT TO PATIENTS, CLINICIANS AND GUIDELINE COMMITTEES.

TAKE HOME MESSAGE

- 1. SO IN TERMS OF PREFERENCES DEFINITELY FFR SCORES AS THE GOLD STANDARD.**
- 2. THE POOLED DATA OF IFR PATIENTS IN DEFINE FLAIR AND IFR SWEDE HEART SHOWED HIGH MORTALITY, DESPITE LOW RISK POPULATIONS. THIS COULD BRING CHANGES IN NEW GUIDELINES.**
- 3. JACC AND EHJ 2023 RECOMMENDATIONS HAVE ALREADY SUGGESTED THAT FFR GUIDED STRATEGY SHOULD BE THE PREFERRED OPTION IN PROXIMAL LESIONS IN LARGE CORONARY ARTERIES WITH A LARGE PERFUSION TERRITORY.**
- 4. . NON INVASIVE INDICES ARE ALWAYS PREFERABLE AND FFRCT AND QFR LOOK PROMISING AND ARE SUPERIOR TO ANGIOGRAPHIC GUIDANCE BUT ARE YET TO FIND THEIR PLACE IN GUIDELINES AND RECOMMENDATIONS**