# DEFINE FLAIR: iFR vs. FFR Guided PCI



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## Definition of iFR:

Instant wave-free ratio across a stenosis during the wave-free period, when *resistance is naturally constant* and minimized in the cardiac cycle



### **DEFINE-FLAIR**



#### **Primary objective**

- Assess safety and efficacy of decision- DEFINE FLAIR • making on coronary revascularisation based on iFR vs FFR

Functional Lesion Assessment of Intermediate stenosis to guide Revascularisation



Assess if iFR is non-inferior to FFR • when used to guide treatment of coronary stenosis with PCI

#### **Primary endpoint**

- Major adverse cardiac events (MACE) • rate in the iFR and FFR groups at 30 days, 1 and 2 years.
- MACE (combined endpoint of death, ٠ non-fatal MI, or unplanned revascularisation)

# DEFINE-FLAIR and iFR SwedeHeart: The largest global physiology outcome trials

- DEFINE FLAIR and iFR Swedeheart are the new landmark physiology studies
- 4500+ patients, more than twice the combined patient population of previous landmark physiology studies
  - DEFINE FLAIR: n = 2492 patients
  - iFR Swedeheart: n = 2037 patients
- 2 prospective, randomized, controlled trials



## Primary endpoint (MACE) iFR equivalent to FFR with less PCI and CABG





### Event rates in deferred patients at 12 months





# Published online NEJM



#### The NEW ENGLAND JOURNAL of MEDICINE

#### ORIGINAL ARTICLE

#### Use of the Instantaneous Wave-free Ratio or Fractional Flow Reserve in PCI

J.E. Davies, S. Sen, H.-M. Dehbi, R. Al-Lamee, R. Petraco, S.S. Nijjer, R. Bhindi, S.J. Lehman, D. Walters, J. Sapontis, L. Janssens, C.J. Vrints, A. Khashaba, M. Laine, E. Van Belle, F. Krackhardt, W. Bojara, O. Going, T. Härle, C. Indolfi, G. Niccoli, F. Ribichini, N. Tanaka, H. Yokoi, H. Takashima, Y. Kikuta, A. Erglis, H. Vinhas, P. Canas Silva, S.B. Baptista, A. Alghamdi, F. Hellig, B.-K. Koo, C.-W. Nam, E.-S. Shin, J.-H. Doh, S. Brugaletta, E. Alegria-Barrero, M. Meuwissen, J.J. Pick, N. van Royen, M. Sezer, C. Di Mario, R.T. Gerber, I.S. Malik, A.S.P. Shatp, S. Talwar, K. Tang, H. Samady, J. Altman, A.H. Seto, J. Singh, A. Jeremias, H. Matsuo, R.K. Kharbanda, M.R. Patel, P. Serruys, and J. Escaned



#### The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

#### Instantaneous Wave-free Ratio versus Fractional Flow Reserve to Guide PCI

M. Götberg, E.H. Christiansen, I.J. Gudmundsdottir, L. Sandhall, M. Danielewicz, L. Jakobsen, S.-E. Olsson, P. Öhagen, H. Olsson, E. Omerovic, F. Calais, P. Lindroos, M. Maeng, T. Tödt, D. Venetsanos, S.K. James, A. Kåregren, M. Nilsson, J. Carlsson, D. Hauer, J. Jensen, A.-C. Karlsson, G. Panayi, D. Erlinge, and O. Fröbert, for the iFR-SWEDEHEART Investigators\*

#### Online now at nejm.org

SAFE to perform physiology-guided coronary revascularization with either iFR or FFR

# $iFR \le 0.89$ or $FFR \le 0.80$

#### Coronary

Imperial College London NHS Trust



Operators: Christopher Baker and Sayan Sen DATE: 2<sup>nd</sup> November 2016

CASE SUMMARY

**Patient Demographics** 

Age: 44 year old Gender: Male

Risk Factors Type II DM Past Medical History Nil

#### **Clinical Presentation**

Exertional breathlessness Echo: Moderate LV impairment. EF 40% DSE: LAD territory ischaemia



London, UK

♦ tct2016

# Take homes from DEFINE-FLAIR and iFR SwedeHeart

• iFR is as safe as FFR to guide coronary revascularization decision-making

iFR has fewer adverse side effects and symptoms

• iFR is quicker to perform

# Building evidence, and expanding choice in intracoronary physiology assessment



Morton Kern

### "The iFR concept has great appeal.

It would make lesion assessment quicker, easier, less expensive, and more widely used, but it must be carefully vetted before wholesale implementation. Each new paradigm rewrites the history of its predecessor. Old theories are discarded and then reconstructed, emerging under a new paradigm. Such was the case with FFR compared with earlier physiology methods. Should largescale validation studies meet positive expectations, iFR may take its place among catheter lab lesion assessment methods, providing critical information for the treatment of our PCI patients."

Kern M. JACC 2012