

JACC Cardiovascular Intervention

## Angiography-Derived Fractional Flow Reserve in the SYNTAX II Trial:

Feasibility, Diagnostic Performance of Quantitative Flow Ratio, and Clinical Prognostic Value of Functional SYNTAX Score Derived From Quantitative Flow Ratio in Patients with 3-Vessel Disease

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JACC Cardiovascular intervention 2019 Feb 11; 12(3):259-270

[https://doi: 10.1016/j.jcin.2018.09.023](https://doi.org/10.1016/j.jcin.2018.09.023)

# Abstract

## Objectives:

The aims of the present study were to investigate the applicability of quantitative flow ratio (QFR) in patients with 3-vessel disease and to demonstrate the impact of functional SYNTAX (Synergy between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery) score derived from QFR (fSSQFR) on clinical outcomes.

## Background:

The applicability of QFR in patients with 3-vessel disease and the feasibility of fSSQFR have not yet been investigated.

## Methods:

All lesions interrogated using instantaneous wave-free ratio and/or fractional flow reserve in the SYNTAX II trial were retrospectively screened and analyzed for QFR. The diagnostic performance of QFR was investigated using hybrid wire-derived pressure assessment (instantaneous wave-free ratio and fractional flow reserve), used in the trial as a reference. Patients with analyzable QFR in 3 vessels were

stratified according to fSSQFR to evaluate its clinical prognostic value on the basis of 2-year patient-oriented composite endpoint.

## Results:

QFRs were analyzable in 71.0% of lesions (836 lesions). The diagnostic performance of QFR to predict binary wire-based ischemia was substantial (area under the curve 0.81, accuracy 73.8%), with a positive predictive value of 85.9%. Independent predictors of diagnostic discordance were lesions in side branches, involvement of bifurcation or trifurcation, and small vessel. According to the 2-year patient-oriented composite endpoint, fSSQFR reclassified 26.1% of the patients (36 of 138) in the high- to intermediate-risk group into the low-risk group appropriately (net reclassification improvement 0.32;  $p < 0.001$ ). The area under the curve for fSSQFR to predict the 2-year patient-oriented composite endpoint was higher than that of the classic anatomic SYNTAX score (0.68 vs. 0.56;  $p = 0.002$ ).

## Conclusions:

QFR demonstrated substantial applicability in patients with 3-vessel disease. The fSSQFR has the potential to further refine prognostic risk estimation compared with the classic anatomic SYNTAX score.

*PMID: 30409759*

*DOI: 10.1016/j.jcin.2018.09.023*