

## Beyond Coronary Angiography: Physiology

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The presence of myocardial ischemia is the most important prognostic factor in patients with ischemic heart disease. The limitation of coronary angiography in the assessment of ischemia is very well-known. Fractional flow reserve (FFR) is a gold standard invasive method to detect the stenosis-specific myocardial ischemia. FFR is defined as ratio of maximal coronary blood flow in diseased artery to maximal coronary blood flow in the same artery without stenosis. The strength of FFR is that FFR can assess the degree and presence of epicardial lesion-specific inducible myocardial ischemia not only in cases with negative or ambiguous result of non-invasive functional test but also in the presence of multivessel disease. FFR-guided revascularization strategy has been proven to be superior to angiography-guided strategy. Recently, a hyperemia-free index, instantaneous wave free ratio (iFR), was developed and under active investigation. iFR is calculated by Pd/Pa ratio at the wave-free period during resting state and does not require hyperemia. A non-invasive FFR derived from coronary CT angiography is also now used in real world practice. Since the coronary artery system has 3 components with different functions (conductive epicardial coronary arteries, arterioles, and capillaries), when any one of these systems fails, myocardial ischemia can occur. The presence of epicardial coronary artery stenosis is not the sole factor for ischemic heart disease. Due to rapid expansion of invasive and non-invasive physiologic assessment in clinical practice, its application requires comprehensive understanding of the role and potential pitfalls of each modality.