vasodilatation. The investigators found that resistance that was measured at rest during the wave-free period was similar in both stability (p=0.96) and magnitude (p=0.70) to values that were achieved under adenosine hyperemia.

The second part of the study evaluated whether the assessment of the significance of a coronary stenosis was numerically similar using iFR and FFR in 157 patients. iFR is defined as an instantaneous pressure ratio across a stenosis during the wave-free period, when resistance is constant and minimized in the cardiac cycle. The FFR was measured following administration of intravenous adenosine to achieve maximal hyperemia.

Measurement of iFR during the wave-free period provided a measure of stenosis severity that was similar to the FFR measurement (r=0.90, regression coefficient y=1.022x + 0.03; Figure 1). The small difference between iFR and FFR was not explained by the magnitude of hyperemia (Figure 2).

Figure 1. Close relationship between iFR and FFR.

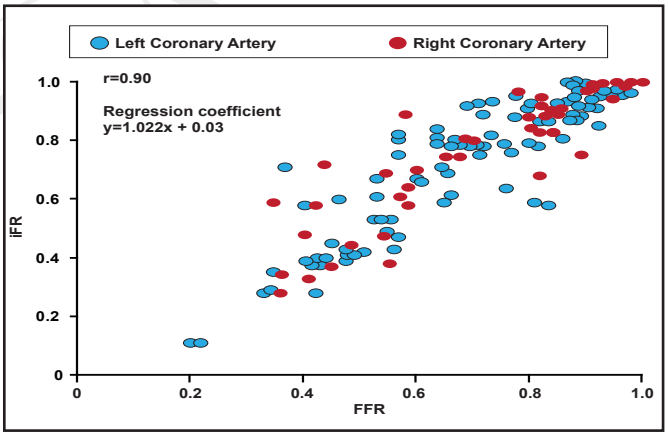

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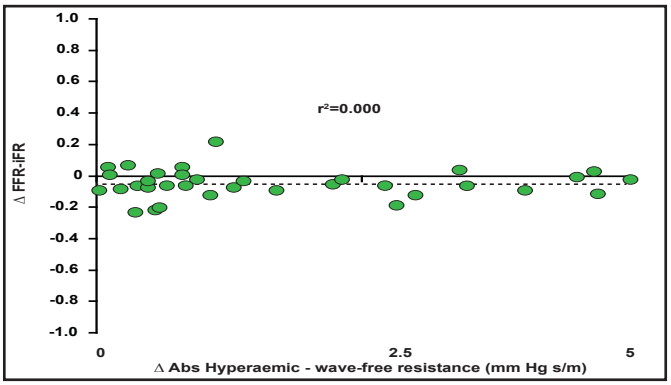
Figure 2. Magnitude of Hyperemia.



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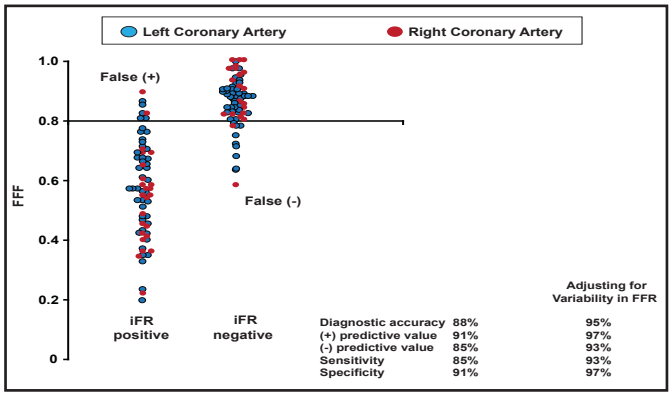
Assessment of the diagnostic efficiency of iFR demonstrated a diagnostic accuracy of 88%, positive predictive value of 91%, negative predictive value of 85%, sensitivity of 85%, and specificity of 91%. After adjustment for the inherent variability in FFR, diagnostic accuracy was 95%, positive predictive value was 97%, negative predictive value was 93%, sensitivity was 93%, and specificity was 97% (Figure 3).

Figure 3. Assessment of Diagnostic Efficiency of iFR After Adjustment for Inherent Variability in FFR.



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The ADVISE study identified a wave-free period in the cardiac cycle when resistance is naturally stabilized and minimal, obviating the need for administration of adenosine. iFR that is measured during this wave-free period gives a measure of stenosis severity that is similar to that provided by FFR. The clinical implications of these results include removal of barriers to adoption of physiological assessment, increased applicability, improved work flow in the catheter laboratory, and improved patient experience.

Point-of-Care Genetic Testing Facilitates Rapid Personalization of Antiplatelet Therapy

Previous studies suggest that *CYP2C19* loss-of-function alleles affect clopidogrel metabolism and are associated with major adverse cardiac events (MACE) and stent thrombosis. *CYP2C19**2 accounts for 95% of *CYP2C19* loss-of-function alleles and occurs in up to 25% of Caucasian populations and 40% of Asian populations.

Currently, most genetic testing is done in central laboratories, with a turnaround time of 2 to 7 days. This delay has prevented the prospective evaluation of genetic testing in percutaneous coronary intervention (PCI) studies. The University of Ottawa Heart Institute, in collaboration with Spartan Biosciences, created the first

point-of-care (POC) genetic test. After 1 hour, nurses were able to determine a patient's *CYP2C19*2* carrier status and whether the patient was heterozygous or homozygous by utilizing the new technology.

The primary objective of the Reassessment of Antiplatelet Therapy using an Individualized Strategy Based on Genetic Evaluation (NCT01184300; RAPID GENE) study, presented by Derek So, MD, University of Ottawa Heart Institute, Ottawa, Ontario, Canada, was to evaluate the feasibility and test characteristics of a nurse-operated POC genetic test to determine *CYP2C19*2* carrier status.

PCI patients with non-ST elevation acute coronary syndrome (ACS) or stable coronary artery disease (CAD) were pretreated with a minimum of 600 mg clopidogrel. Following baseline platelet function testing, the patients were randomized 1:1 to rapid genotyping (RG; n=102) using the new POC technology or to no POC testing and standard therapy (ST; n=98) with clopidogrel 75 mg daily. In the RG group, *CYP2C19*2* carriers were treated with prasugrel 10 mg daily, and noncarriers were treated with clopidogrel 75 mg daily. At 1 week, all patients underwent platelet function testing and DNA sequencing. Patients in the ST arm also underwent POC rapid genotyping after 1 week.

The primary endpoint was the proportion of *CYP2C19*2* carriers with a P_2Y12 reaction unit (PRU) >234 (consistent with high on-treatment platelet reactivity) after 1 week of dual antiplatelet therapy.

In the RG arm, POC genotyping identified 25.3% (n=23) of patients as *CYP2C19*2* carriers, with 20.9% heterozygous and 4.4% homozygous. In the ST group after 1 week, POC genotyping identified a similar proportion of patients as *CYP2C19*2* carriers (24.0%; n=23), with 20.8% heterozygous and 3.1% homozygous. Compared with direct DNA sequencing, POC genotyping had a sensitivity of 100%, specificity of 99.4%, and a conclusive rate of 93.6%.

The proportion of *CYP2C19*2* carriers with high on-treatment platelet reactivity (PRU >234) was significantly lower in the RG group (prasugrel-treated) compared with the ST group (clopidogrel-treated; 0% vs 30.4%; p=0.009). *CYP2C19*2* carriers who were treated with prasugrel as compared with clopidogrel had a significantly lower PRU at 7 days (75.6 vs 207.3 PRU; p<0.001) and greater platelet inhibition after 7 days (73.3 vs 27.0 PRU; p<0.001), demonstrating the superior antiplatelet efficacy of prasugrel in this population. No MACE occurred in either group at 7 and 30 days.

POC genetic testing at the bedside, performed by nurses, is feasible and can accurately identify *CYP2C19*2* carriers. This novel, rapid genetic test facilitates rapid personalization of antiplatelet therapy. Administration of prasugrel to *CYP2C19*2* carriers decreased the rate of high on-treatment platelet reactivity relative to standard therapy with clopidogrel. These findings represent the validation and proof-of-concept of the first POC genetic test in clinical medicine. The results of the RAPID GENE trial will hopefully lead to larger-scale studies that can establish the role of pharmacogenomic tailored antiplatelet therapy after PCI.

Bioabsorbable Polymer Stent Noninferior to Permanent Polymer Stent

Durable polymer coatings on drug-eluting stents are associated with chronic inflammation and impaired healing. The reduced polymer load and short-term polymer exposure of bioabsorbable polymer stents may reduce duration of dual antiplatelet therapy (DAPT), reduce risk with DAPT interruption, and decrease stent thrombosis.

The SYNERGY stent has a PLGA bioabsorbable polymer coating plus everolimus that is applied only to the abluminal surface of a thin-strut platinum chromium stent. Once implanted, the polymer coating completely resorbs within 4 months. The Randomized Evaluation of a Novel Bioabsorbable Polymer-Coated, Everolimus-Eluting Coronary Stent (EVOLVE) trial, presented by Ian Meredith, MBBS, PhD, Monash Medical Centre and Southern Health, Melbourne, Australia, compared the bioabsorbable polymer SYNERGY Everolimus-Eluting Coronary Stent System with the permanent polymer PROMUS Element Stent for the treatment of *de novo* atherosclerotic lesions.

Two SYNERGY bioabsorbable stents were compared with the PROMUS Element permanent polymer stent. One SYNERGY stent had an everolimus dose and release profile that was similar to that of the PROMUS Element. The SYNERGY ½ Dose had half the dose of everolimus and a similar release profile to the PROMUS Element. Patients with *de novo* native coronary lesions (≤28 mm in length, reference vessel diameter ≥2.5 mm and ≤3.5 mm, %DS >50) were randomized to receive the PROMUS Element (n=98), SYNERGY (n=94), or SYNERGY ½ Dose (n=99). The primary clinical endpoint was target lesion failure (TLF) at 30 days, defined as target vessel cardiac death, target vessel myocardial infarction (MI), or target lesion revascularization. The primary angiographic