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**SASCI**

South African  
Society of  
Cardiovascular  
Intervention

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**SASCI STATEMENT ON USE OF INTRA-VASCULAR ULTRA SOUND AND FRACTIONAL FLOW RESERVE IN IMPROVING OUTCOMES AND COST EFFICIENT MANAGEMENT IN PATIENTS UNDERGOING CORONARY ANGIOGRAPHY**

The Executive Committee of the South African Society for Coronary Intervention has reviewed the data on the appropriate use of Intra-Vascular Ultrasound (IVUS) (aka ICUS) and Fractional Flow Reserve (FFR) and strongly recommends that the cost pertaining to the use of these devices is routinely covered by the medical aid fund, and that this payment is pre-authorized prior to the coronary angiogram being done.

Currently most medical aids exclude the use of IVUS or FFR and, if used in such patients during coronary angiography, payment for the devices is often withheld by the medical aid despite subsequent motivation of appropriate use by the cardiologist. This cost (of approximately R8000 for FFR and R10 000 for IVUS) is therefore passed onto the patient. We believe that this is unfair on the patient as the appropriate use of IVUS and FFR have been shown to improve patient outcomes in the short and long term<sup>1,2,3,4</sup>, reduce number of stents implanted by approximately 30%<sup>4</sup> and are cost effective. Therefore by not guaranteeing to cover the cost of these devices, stents (usually drug eluting stents at R14000 each) may be inserted in non-significant lesions. Patient outcomes in the short and long term may be worse, resulting in more repeat hospital admissions and possible coronary interventions. The net result of which is higher cost to the funders in the long term.

FFR is used to determine whether a coronary artery stenosis (narrowing) is of functional significance or not<sup>5</sup>. It is very difficult to determine this on angiography alone especially if the angiographic stenosis is 50-70%. FFR is performed in the cardiac catheterization laboratory after coronary angiography and takes about 5-10 minutes to do. Where FFR is not available, cardiologists are likely to stent these lesions routinely, as they are thought to be flow significant and the cause of the patients symptoms, FFR assessment of the lesion in question is likely to show that approximately 30% are in fact NOT flow significant and therefore do not require an intervention – be that a stent or bypass surgery.

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In fact it has been shown that inappropriate stenting worsens the 1year outcome<sup>2</sup>. On the other hand, appropriate FFR guided stenting results in a better outcome than best medical therapy alone in patients with stable coronary disease<sup>3</sup>. Appropriate FFR use would be in approximately 20-30% coronary angiography cases. FFR is a technology that reduces cost and improves outcomes – the best case scenario for any technology.

IVUS allows for accurate measurement of vessel diameter (rather than relying on angiographic measurement alone which often underestimates true lumen diameter) and therefore correct stent size choice. It's other main use is to determine whether a stent is well deployed with good stent expansion and apposition to the vessel wall. These 2 factors result in better short and long term outcomes following stent deployment due to a lower incidence of stent thrombosis and less in stent restenosis respectively<sup>6,7,8</sup>. Appropriate IVUS use would be in approximately 5-10% of cases.

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## References:

### **1. Influence of Routine Assessment of Fractional Flow Reserve on Decision Making During Coronary Interventions**

Fernando M. Sant'Anna, MD, PhDa,b,\* , Expedito E.R. Silva, MD, PhDb, Leonardo Alves Batista, MDa, Fabio Machado Ventura, MDa, Carlos Alberto Mussel Barraza, MDa, and Nico H.J. Pijls, MD, PhDc. (Am J Cardiol 2007; 99: 504-508)

### **2. Fractional Flow Reserve versus Angiography for Guiding Percutaneous Coronary Intervention**

Pim A.L. Tonino, M.D., Bernard De Bruyne, M.D., Ph.D., Nico H.J. Pijls, M.D., Ph.D., Uwe Siebert, M.D., M.P.H., Sc.D., Fumiaki Ikeno, M.D., Marcel van 't Veer, M.Sc., Volker Klauss, M.D., Ph.D., Ganesh Manoharan, M.D., Thomas Engstrom, M.D., Ph.D., Keith G. Oldroyd, M.D., Peter N. Ver Lee, M.D., Philip A. MacCarthy, M.D., Ph.D., and William F. Fearon, M.D., for the FAME Study Investigators\* N Engl J Med 2009;360:213-24.

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### **3. Fractional Flow Reserve-Guided PCI versus Medical Therapy in Stable Coronary Disease**

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### **4. Percutaneous Coronary Intervention of Functionally Nonsignificant Stenosis 5-Year Follow-Up of the DEFER Study**

Nico H. J. Pijls, MD, PHD,\* Pepijn van Schaardenburgh, MD,\* Ganesh Manoharan, MD,<sup>†</sup> Eric Boersma, PHD, ‡ Jan-Willem Bech, MD, PHD,\* Marcel van't Veer, MSC,\* Frits Bar, MD, PHD,§ Jan Hoorntje, MD, PHD, \_ Jacques Koolen, MD, PHD,\* William Wijns, MD, PHD,<sup>†</sup> Bernard de Bruyne, MD, PHD<sup>†</sup> Eindhoven, Rotterdam, Maastricht, and Zwolle, the Netherlands; and Aalst, Belgium (JACC 2007)

### **5. Measurement of fractional flow reserve to assess the functional severity of coronary-artery stenoses**

Nico H.J. Pijls, M.D., Ph.D., Bernard DeBruyne, M.D., Kathinka Peels, M.D., Pepijn H. Vanvoort, M.D., Hans J.R.M. Bonnier, M.D., Ph.D. Jozef Bartunek, M.D., and Jacques Koolen, M.D., Ph.D. (N Engl J Med 1996; 334:1703-8.)

### **6. Impact of Intravascular Ultrasound Imaging on Early and Late Clinical Outcomes Following Percutaneous Coronary Intervention with Drug-Eluting Stents**

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### **7. Prospective Application of Pre-Defined Intravascular Ultrasound Criteria for Assessment of Intermediate left Main Coronary Artery lesions Results From the Multicenter LITRO Study**

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Badalona, Toledo, and Valladolid, Spain*

(Journal of the American College of Cardiology Vol. 58, No.4, 2011)

**8. Impact of Intravascular Ultrasound Guidance on Long-Term Mortality in  
Stenting for Unprotected Left Main Coronary Artery Stenosis**

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Seong-Wook Park, MD, PhD; for the MAINCOMPARE Investigators  
(Circ. Cardiovascular Interventions 2009; 2:167-177)

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