

Medical Physics and beyond - diagnostics for arterial disease

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This seminar concerns 2 vascular diseases; atherosclerosis and abdominal aortic aneurysm. Categorisation of patients for surgery is based on assessment of diameter using ultrasound. The talk will be divided into several parts. First the clinical background will be given including limitations of current methods. Second will describe an evaluation of in-vivo measurement errors and methods to improve these errors including dual-beam Doppler ultrasound. The importance of the development of validation devices including flow phantoms will be described. Third new potential diagnostic markers of disease development and rupture based on biomechanical considerations will be described, including wall stress, wall shear stress and elastic modulus. Our experience of measuring these in volunteers and patients using MRI and ultrasound will be described. The final part will describe our experience of combining 3D medical imaging with patient specific modelling for estimation of biomechanical parameters.

Short Biosketch

Peter Hoskins is Professor of Medical Physics and Biomechanics at the University of Edinburgh. He studied Physics at Oxford University from 1977-1980. He worked as a trainee Medical Physicist in Lincolnshire (UK) for 4 years, and joined the Medical Physics Department in Edinburgh (UK) in 1984. From 1984 to 2001 he combined research work in ultrasound imaging with hospital service work in diagnostic radiology. He was awarded PhD in 1990 for work in obstetric Doppler, and has gained major UK and European prizes (IPEM Founders Prize 1993, Euroson Young Investigator Award 1993). He was promoted to Consultant Medical Physicist in 1998. In 2006 he moved to a University appointment and gained a personal chair in 2012. His research has been concerned with the development of ultrasound techniques for diagnosis of cardiovascular disease, patient specific modelling and elastography. He has published 110 refereed journal papers and is principal author of 3 books. He is FIPeM (1994), FInstP (2007), FIHEA (2013) and was awarded DSc (2009) for his work on arterial mechanics. He is on the Editorial Advisory Board of Ultrasound in Medicine and Biology and of the British Journal of Radiology, and sits on several committees including IPEM Council and BMUS Council.