Poster 16:

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Collecting In Vivo Flow data and Medical Imaging for Successful Computational Flow Dynamics (CFD) Modelling

Introduction - Computational Fluid Dynamics (CFD) has been proven as a powerful research tool for assessing blood flow through patient specific anatomy. Work in this field usually requires a collaborative effort between clinicians and engineers and at times can be hindered by technical terminology and a limited understanding of each other's expertise.

Objective - Rather than reporting findings of specific CFD based research, this poster aims to provide an overview of the basic elements required to model patient specific anatomy in silica, using commercially available CFD software. It is hoped that by demonstrating how different imaging modalities may be used to model patient's anatomy, and how data extracted from Doppler ultrasound investigations provides time dependent boundary conditions for the models, this poster will give clinical staff an understanding of the prerequisites for creating a reliable CFD model, and will also aide engineers in requesting the most appropriate imaging and haemodynamic investigations from the clinical team.

Summary & Conclusion - Good communication between a multi disciplinary team of engineers, radiologists, vascular scientists and surgeons during the planning stages of CFD based research can lead to the development of CFD models with improved resolution, eliminate certain assumptions, and improve estimates of haemodynamic parameters. This approach has the potential to significantly reduce error margins associated with patient specific CFD modelling compared to retrospectively designed models based on routine imaging.