



**UNSW**  
SYDNEY



## Fluid Analysis and Medical Imaging

**An interdisciplinary approach in which engineering technologies and a combination of computational and dynamic techniques are used to solve real world clinical and industrial problems in the field of vascular flow.**

### Competitive advantage

- Close collaboration and established relationships with hospitals and local health organisations to ensure the work is relevant, solves the right problem, and is gaining useful results
- Cutting-edge research, driven by clinical issues and medical questions
- Global recognition in high-impact journals

### Impact

- The work is insightful and builds on fundamental findings in flow physics. It falls into three broad areas: dialysis vascular access, stenosis and stents, and medical imaging/ultrasound. Although new knowledge usually takes an average of 17 years to enter healthcare delivery, the high level of collaboration has been shown to deliver immediate impact.

### Successful outcomes

- Findings have changed stent implantation practice amongst surgeons
- Developed a model using Computer Fluid Dynamic modelling and Matlab to reproduce ultrasound indices used in determining the health of the in-utero baby

### Capabilities and facilities

- Obtaining reliable data and running models—primarily using ANSYS Fluent—on the local and off-site computing clusters
- Experimental laboratory with laser systems, including 3D laser doppler anemometry and planar, stereo and tomographic particle imaging velocimetry
- Use of two in-house designed pulsatile flow pumps
- In-house developed freehand ultrasound system allows the building of accurate, 3D representations of vasculature using only B-mode imaging

### Our partners

- The Royal Hospital for Women
- Prince of Wales Hospital
- Prince of Wales Private Hospital
- Concord Repatriation General Hospital
- Abbott Vascular Pty Ltd
- Medtronic Pty Ltd

### More Information

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