MEDIA RELEASE

3D printing – a stepping stone to personalised surgery

7 May 2018

A new study has discovered how 3D printing is improving quality and safety in surgery.

Using a comprehensive search strategy of multiple medical research databases, Dr Jasamine Coles-Black identified and reviewed 392 articles and cross-referenced the findings against the Austin Health 3D Medical Printing Laboratory’s own experiences.

The detailed analysis discovered multiple ways 3D printing is enhancing quality and safety and paving the way to personalised surgery.

The study found that 3D printing improved patient and carer understanding of their anatomy and the planned surgical procedure.

It improved patient and carer satisfaction and engagement when compared to other media sources such as verbal information, written material, anatomical drawings or x-ray images.

It also proved to be a useful tool in pre-surgical planning. Patient-specific models (see pictures below) improved patient safety with reduced time under anaesthesia, reduction in operation time, shorter recovery times, and a reduction in blood loss intraoperatively.

Dr Coles-Black’s study presented solutions to the often-quoted barriers to 3D printing adoption, including a shortage of technical knowledge, perceived costs, and the lack of definitive regulation in Australia to date.

This study builds upon previous research and publications by her research group including in the Medical Journal of Australia in 2017 (Coles-Black J, Chao I, Chuen J. 3D Printing in Medicine. Medical Journal of Australia. 2017 August;207(3):102–103.)

“3D printing lends itself to improving quality and safety by aiding the visualisation of complex anatomy,” Dr Coles-Black said.

“It’s brilliant for both the surgeon and the patient. A surgeon can practice delicate procedures prior to surgery and learn how to circumvent potential issues.

“Surgeons can also show a patient exactly what is going to happen and the steps involved in the planned surgical procedure.

‘If you can imagine it, you can create it, from blood vessels in the heart to vertebrae in the back. The surgical applications of 3D printing are endless.”

“With the expiry of patents, 3D printers are now available for as little as a few hundred dollars” Dr Coles-Black said. “Our lab aims to bring clinicians and engineers together so that we are as prepared as possible for this 3D printing revolution with technical skills, an understanding the limitations of 3D printing, and early discussion of issues around regulation and ethics.”

Media inquiries: Gabrielle Forman, Communications & Policy Officer  
t: +61 3 9276 7430 | m: +61 498 218 008
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In conjunction with her supervisor Mr Jason Chuen, Dr Coles-Black will be making a poster presentation at the upcoming Annual Scientific Congress in Sydney from 7 – 11 May, which will detail the methods, results and conclusion of their studies.

In addition, Mr Chuen will be making a verbal presentation on “3D printing in vascular practice: A passing fad or pioneering technology?” on Thursday 10 May at 8.30am.

The surgeons will present their research at the Royal Australasian College of Surgeons’ 87th Annual Scientific Congress which is being held in Sydney between 7-11 May. The congress brings together some of the top surgical and medical minds from across New Zealand, Australia, and the rest of the world.

For more information about the Annual Scientific Congress please visit: https://asc.surgeons.org/

Please find below a link to a time-lapse video and images of multiple models created by the Austin Health 3D Medical Printing Laboratory:

https://www.youtube.com/watch?v=mEg76KaegCs

More videos are available on the Austin Health 3D Medical Printing Laboratory Youtube Channel:

http://3dmedlab.org.au/youtube

A list of previous publications is available at: http://3dmedlab.org.au/publications/
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For more information about the Annual Scientific Congress please visit: https://asc.surgeons.org/
For more information about the Austin 3D Medical Printing Laboratory please visit: http://3dmedlab.org.au

About the Royal Australasian College of Surgeons (RACS)
RACS is the leading advocate for surgical standards, professionalism and surgical education in Australia and New Zealand. The College is a not-for-profit organisation that represents more than 7000 surgeons and 1300 surgical trainees and International Medical Graduates. RACS also supports healthcare and surgical education in the Asia-Pacific region and is a substantial funder of surgical research. There are nine surgical specialties in Australasia being; Cardiothoracic surgery, General surgery, Neurosurgery, Orthopaedic surgery, Otolaryngology Head-and-Neck surgery, Paediatric surgery, Plastic and Reconstructive surgery, Urology and Vascular surgery.

www.surgeons.org

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