



## *Media Statement*

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### Ultrasound in space

Two RPH staff members have taken their sonography work out of this world and into space.

RPH Tudor Sonographer Marilyn Zelesco and Senior Radiographer Dr Rob Hart have developed instructions so astronauts can use ultrasound on the International Space Station (ISS).

A few years ago Dr Rob Hart's work into the use of ultrasound in stroke survivors sparked interest with medical staff at Johnson Space Centre in Houston, USA.

"The lack of gravity in space results in the head being filled up with blood - these physiological changes that occur in space are similar to those seen in stroke survivors," Dr Hart said.

In 2001 an ultrasound scanner was installed on the International Space Station as an item of biomedical research infrastructure.

Marilyn Zelesco followed on from Dr Hart's findings and completed her Masters on ultrasound in space in 2006. Last year she received an award from the Royal Melbourne Institute of Technology for this work.

Ms Zelesco said Australia is in a unique position to assist with ultrasound use in space due to its remoteness.

"Here in Australia we have areas so remote that evacuation of an injured or ill person can't be immediate, which is also similar on the ISS," she said.

"Cutting a mission short is extremely expensive and evacuation of an injured or ill crew member is currently not an option.

"It was noted that there were few astronauts trained in sonography so we decided to create a set on instructions to be used by novices so they can

operate the ultrasound in space and produce images to determine if evacuation is necessary.”

Dr Hart said the ultrasound on the ISS is used as a triage tool since evacuation is impossible.

“It takes a minimum of three days to get to the ISS, once there the ultrasound can be used on an ill/injured astronaut so the image can be transmitted and assessed quickly as to whether the mission needs to be aborted,” Dr Hart said.

During their research Dr Hart and Ms Zelesco tested the use of ultrasound in near-zero gravity on a small aeroplane.

During controlled free-fall, near-weightlessness occurs for around seven to ten seconds, giving the researchers the opportunity to use an ultrasound probe on themselves.

Dr Hart said one of the major physiological changes that occur in zero gravity is that the jugular vein increases in size dramatically as blood rushes quickly through the vein to the head.

“This is ultrasound in extreme medicine, the opportunities are endless especially as Australia is such a vast country with people working or residing in many remote areas, particularly on mine sites where injury can occur.”

Dr Hart and Ms Zelesco work is also being taken up by people in the Antarctic.

Ms Zelesco said the ultrasound has not yet been used clinically on the ISS, it has only been used a research tool.

“If these protocols are ever required to support the management of injury on-orbit it is hoped the best possible patient outcome is achieved,” Ms Zelesco said.

“It is to be hoped, of course, that they remain untested indefinitely.”

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