REMOTE ISCHEMIC PRECONDITIONING DEVICE

THE EXISTING PROBLEM OR ISSUE
Remote ischemic preconditioning is a technique to protect the heart and other organs against lethal acute ischemia–reperfusion injury by applying one or more cycles of brief, nonlethal ischemia and reperfusion to a remote organ or tissue.

Applying a preconditioning procedure externally to an upper or lower limb is especially attractive as it is non-invasive, easy to implement and safe. Blood flow to the limb during the procedure is typically occluded for 3-5 minutes by a manually or automatically inflated blood pressure cuff or a tourniquet cuff. A deflation interval of 3-5 minutes then follows and this cycle is repeated 3-4 times.

OUR SOLUTION
We have made a compact automated device for remote ischemic preconditioning that includes a cuff and actuator and a controller that operates the actuator according to a treatment protocol as well as a feedback loop which ensures that the preconditioning is effective.

The treatment protocol includes a plurality of treatment cycles that each comprises cuff actuation, an ischemic duration, cuff release, and a reperfusion duration. The innovation of our system is to equip the device with a feedback control system which automatically regulates the required ischemic pressure, based on oxygen level in the blood/pulse pressure, to achieve an effective preconditioning.

APPLICATIONS
- Ischemic heart disease and stroke
- Emergency medical service by paramedic during patient transport to hospital
- Pre-procedure preparation of a patient before an elective procedure
- Regulation of patient with high risk of developing organ failure
- Interventions or surgeries when blood flow to an organ is temporarily interrupted

ADVANTAGES | BENEFITS
--- | ---
Blood pressure cuff or tourniquet cuff controlled by actuator/controller | Safely and easily fits over upper or lower limbs
Automated cycling | Controlled ischemic events
Sensing system taking in blood oxygen and pulse pressure | Controlled reperfusion events

INVENTORS
Ashkan Javadzadegan, Andy Yong, Abouzar Moshfegh

INTELLECTUAL PROPERTY POSITION
Australian Patent Application: A patient-specific remote ischemic preconditioning method with multi-layer feedback control unit

WOULD YOU LIKE TO KNOW MORE?
Anna Grocholsky +61(0) 437 463 317
anna.grocholsky@mq.edu.au

ADVANTAGES
- Blood pressure cuff or tourniquet cuff controlled by actuator/controller
- Automated cycling
- Sensing system taking in blood oxygen and pulse pressure

BENEFITS
- Safely and easily fits over upper or lower limbs
- Controlled ischemic events
- Controlled reperfusion events
- Allows automated system to optimise preconditioning

research.mq.edu.au

CRICOS Provider 00002J

2015026