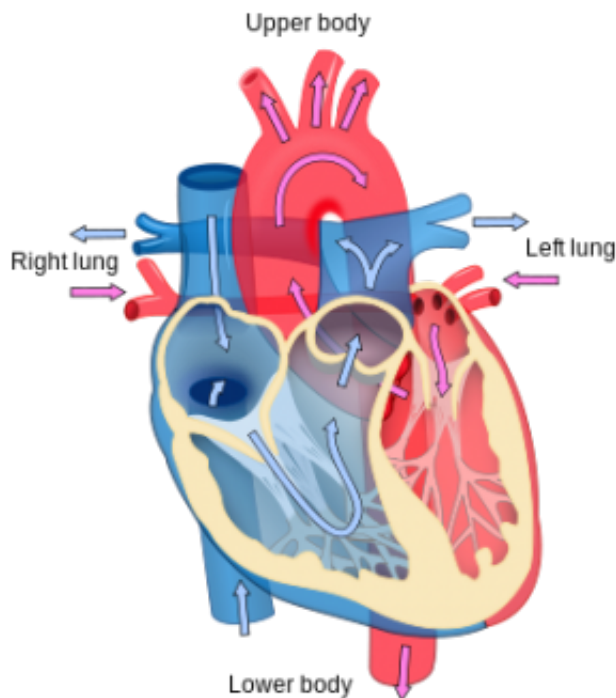


Shutting off blood supply to an extremity to protect the heart

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Heart diagram. Credit: Wikipedia

In a study just published in the *International Journal of Cardiology*, researchers from the K.G. Jebsen Center for Exercise in Medicine – Cardiac Exercise Research Group (CERG) at the Norwegian University of Science and Technology (NTNU) and the Department of Cardiothoracic Surgery at the St. Olavs Hospital in Trondheim, Norway have shown that shutting off the blood supply to an arm or leg before

cardiac surgery protects the heart during the operation.

The research group wanted to see how the muscle of the left chamber of the heart was affected by a technique, called RIPC (remote ischemic preconditioning), during cardiac surgery. RIPC works by shutting off the blood supply to an arm or a leg before heart surgery. The goal is to reduce risk during [cardiac surgery](#) in the future.

The technique is not new, but its effects have never before been tested directly on the left chamber of the heart.

"During [heart surgery](#) we have to stop the blood supply to the heart to be able to operate on it. After some time without fresh blood, the heart will reduce its ability to produce energy because it doesn't get oxygen. When we shut off the [blood flow](#) to another large muscle, such as an arm or a leg, the body prepares for an upcoming challenge by mobilizing its defense system", says the first author of the study, Katrine Hordnes Slagsvold, a PhD candidate at NTNU and medical doctor at St. Olav's Hospital.

The researchers investigated cardiac tissue from 60 patients who had [coronary bypass surgery](#) at St. Olavs Hospital in Trondheim. The patients were randomized to either undergo RIPC, or to a control group.

Patients who were treated with RIPC underwent brief periods without [blood supply](#) to the arm before surgery, by inflating a blood pressure cuff for five minutes three times.

"The [heart muscle](#) of the patients who had restricted blood flow to their arm before surgery was able to maintain the same level of energy production during the whole operation, while heart muscle from the other patients' hearts was not. This may be important because heart tissue is dependent on energy to survive, as well as to repair injuries the

cells may have endured during surgery," Slagsvold says.

The researchers also found that a protein called Akt was activated after RIPC, and believe that activation of this protein may be key in inducing the protective effect on the [heart](#).

Provided by Norwegian University of Science and Technology

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