

# Pre-operative exercise substantially helps with recovery, study confirms

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Policy-makers are being urged to take notice of a University of Otago study that confirms that undertaking a short program of high intensity interval training before surgery can substantially help with recovery.

The study, published in the journal *JAMA Network Open* , reviewed and analyzed 12 studies including 832 patients who had undertaken

preoperative [high-intensity interval training](#). Such training involves repeated aerobic high-intensity intervals at about 80% of the maximum heart rate followed by active recovery.

Lead investigator Dr. Kari Clifford says the study included all types of major surgeries—those expected to last more than two hours or with an anticipated blood loss of greater than 500ml—and included liver, lung, colorectal, urologic and mixed major abdominal surgeries. The average age of participants in the intervention group was 66 and 67 in the control group.

"We have found that high intensity interval training (HIIT) is safe and effective for [surgical patients](#). A HIIT program can meaningfully improve a patient's fitness within four to six weeks, and this reduces [postoperative complications](#) and length of stay."

The most significant result was the change in cardiorespiratory fitness (CRF)—a measure of how well the body takes in oxygen and delivers it to the muscles and organs during prolonged periods of exercise.

"The pooled results suggest that HIIT increases [cardiorespiratory fitness](#) by 2.39 ml/min/kg. This is not only significantly different than standard surgical care, but is also clinically relevant: we know that this level of increase is associated with a lower risk of adverse postoperative outcomes."

Generally, post operative complications occur in about 30% of patients, or up to 50% for frail [patients](#). In the study, those who undertook high intensity interval training prior to surgery, showed a consistent reduction in post-surgery complications, such as cardiac complications, pneumonia, and postoperative bowel issues, she says.

"Our study's pooled results showed that HIIT reduces the risk of having a

[complication](#) by 56%, which is substantial; and on average they stayed for three fewer days in hospital."

"All of these findings suggest that a period—even as brief as four weeks—of pre-surgery high intensity interval training may substantially improve patient outcomes and bring with it robust benefits across patient populations," she says.

The next step is to find out how to implement such programs.

"Supervised exercise programs can be expensive, so we are looking at how effective it is to support people training at home or in the community. Funding these programs may save money in the long term by reducing the cost of hospital stay and surgical complications.

"In the meantime, I would say to everyone, it is never too late to improve fitness, and this can really make a difference to [health outcomes](#) in the surgical context."

**More information:** Kari Clifford et al, Association of Preoperative High-Intensity Interval Training With Cardiorespiratory Fitness and Postoperative Outcomes Among Adults Undergoing Major Surgery, *JAMA Network Open* (2023). [DOI: 10.1001/jamanetworkopen.2023.20527](#)

Provided by University of Otago

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