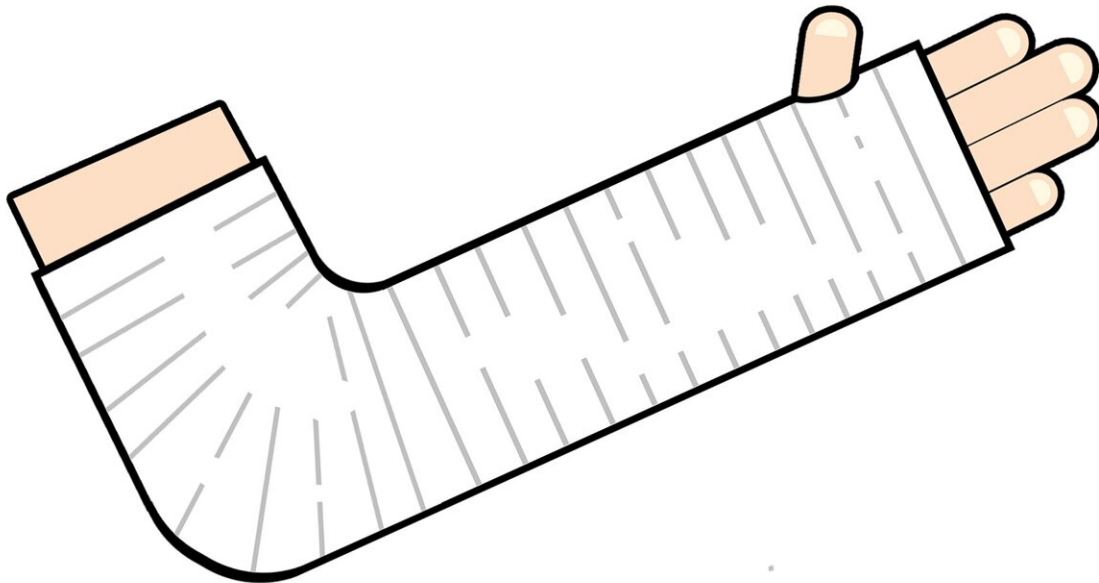


# Can't exercise a particular muscle? Strengthening the opposite side of your body can stop it wasting away

March 2 2023

---



Credit: Pixabay/CC0 Public Domain

Loss of muscle strength can be one of the most damaging outcomes when someone is unable to move a part of their body for a long period of time.

But a new Edith Cowan University (ECU) study may have found a way to offset or even protect against this—and it doesn't even involve the affected body part at all.

Injury or illness may see a part of the body incapacitated for weeks or even months, causing unused muscles to weaken and lose their mass and strength, which can have a huge impact on people's lives.

Lead researcher Professor Ken Nosaka noted it was already known gaining [muscle strength](#) in one limb due to [resistance training](#) will transfer to the same muscle on the opposite side of the body.

"This is known as the cross-education effect," he said. "However, the key aspect of this study is one particular type of muscle contraction proved most effective."

## **The study**

The research was a collaboration between ECU and Professor Trevor Chen from National Taiwan Normal University.

It saw 36 sedentary young men have their non-dominant arm immobilized by wearing a cast at their elbow joint for three weeks.

They were then split into three even groups: a concentric contraction group that lifted a dumbbell using the non-immobilized arm, an eccentric [contraction](#) group that lowered a dumbbell, and a [control group](#) that performed no exercises.

While their arm was immobilized, the concentric and eccentric groups had six weightlifting sessions twice a week, for three weeks.

These sessions would see them perform five sets of six dumbbell curls

with a dumbbell corresponding to 20%, 40%, 40%, 60%, 60% and 80% of their maximal strength over the six sessions.

## **Eccentric is best**

When the cast was removed, the control group who did no exercises saw more than 15% decreases in strength in the immobilized arm.

However, those who lifted weights saw little to no drop off in the immobilized arm's muscle strength.

The concentric group saw muscle strength reduced to 4%, but interestingly, muscle strength increased 4% for the eccentric group, showing a stronger cross-education effect.

Researchers also measured the size of the muscle on the immobilized arm.

The control group saw muscle size decrease by around 12%, whereas both concentric and eccentric muscle contractions with the opposing arm counteracted muscle atrophy in the immobilized arm.

Muscle size still decreased 4% for the concentric group, while—remarkably—no decreases in muscle size were observed for the eccentric group.

## **Muscle damage protective effect**

All participants were asked to perform 30 eccentric contractions with their immobilized arm once the cast was removed, with researchers measuring various muscle damage markers before, immediately following, and five days after the exercise.

The control group showed very severe muscle soreness and strength loss after the exercise, with the concentric group showing far less damage.

Again, the eccentric group saw the best results, providing a protective effect strong enough for peak muscle soreness to be reduced 80% compared to the control group and 40% of the concentric group.

Professor Nosaka said these results supported previous ECU research highlighting the benefits of eccentric exercise.

"We already know eccentric muscle contractions appear to be the most effective at promoting [muscle strength](#) and size gains—even in very small doses," he said.

"It is important to investigate whether this latest study's results are replicated for other muscles and whether eccentric resistance training is effective when dealing with immobilization in real injuries, such as ligament sprains or tears, bone fracture, and post-surgery.

"However, health care providers can recommend resistance training—and eccentric contractions in particular—to minimize the negative effects of immobilization and hopefully lessen its impact on people's lives."

"Effects of unilateral eccentric versus concentric training of non-immobilize arm during immobilization" was published in *Medicine and Science in Sports and Exercise*.

**More information:** Trevor C. Chen et al, Effects of Unilateral Eccentric versus Concentric Training of Non-Immobilized Arm During Immobilization, *Medicine & Science in Sports & Exercise* (2023). [DOI: 10.1249/MSS.0000000000003140](https://doi.org/10.1249/MSS.0000000000003140)

Provided by Edith Cowan University

Citation: Can't exercise a particular muscle? Strengthening the opposite side of your body can stop it wasting away (2023, March 2) retrieved 20 April 2024 from <https://medicalxpress.com/news/2023-03-muscle-side-body.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.