

27 April 2021

HIIT and resistance training builds muscle and improves fitness in middle-aged men, ACU study

A six-week exercise program of either high-intensity interval training (HIIT) or resistance training can help middle-aged men build and maintain muscle mass and strength, new ACU research has found.

The Mary Mackillop Institute for Health Research (MMIHR) study, published in [Medicine and Science in Sports and Exercise](#), found middle-aged men who undertook an intense program of targeted exercise for six weeks were able to maintain gains in muscle strength for two to three weeks after ceasing all structured exercise.

The research, led by PhD candidate Marcus Callahan, found a short-term program of either HIIT or resistance exercise was the best way to build and maintain any muscle gain, metabolic health and function before a period of forced or planned inactivity such as surgery.

They compared the muscle strength and aerobic capacity of 35 overweight, middle-aged men who were randomised to perform six-weeks of either endurance training, resistance training or HIIT, before stopping the activity for 2.5 weeks, to test which exercise prevented muscle loss and maintained physical fitness.

“This is relevant and practical information for anyone who needs to get as functionally fit as they can in six to eight weeks before a planned rest or break, such as surgery,” Professor John Hawley, director of the Mary Mackillop Institute for Health Research said.

“If it was me going in to have surgery, I would be doing the resistance exercise or HIIT. Endurance exercise is a good way to build up cardiovascular fitness, but you want that functional muscle mass to be able to get back to normal daily activities as soon as possible.

“We also looked at what happens during a two-week period of inactivity (detraining) and found that both HIIT and resistance training were far superior in retaining some of the training-induced adaptations.

“The bottom line is that you could retain many of the adaptations accrued in that six-week training period even if you were unfit beforehand.”

Protecting older muscle from wasting during injury or hospitalisation is important as muscle loss can be extremely hard to recover from and can lead to long-term health and disease complications.

Muscle loss, known as sarcopenia, affects one in three Australians over the age of 60 years. The condition has higher risk of fractures and falls, and is associated with diabetes, obesity, chronic kidney failure, heart failure and vitamin D deficiency.

“We know that resistance exercise will result in muscle hypertrophy (bigger muscles) and make your functionally stronger” Professor Hawley said.

“In contrast, endurance training does very little to increase muscle strength but is excellent for cardiovascular health. We wanted to see if HIIT could also have an ‘anabolic’ muscle growth-like effect.

“To gain muscle mass participants were prescribed a high protein diet – with real food – as well as protein shakes after exercise and we were able to either retain the muscle mass or gain further mass, which was a novel finding.”

A protein rich diet is essential to maximise gains in muscle mass and cancel out any muscle loss during hospitalisation and bedrest.

“If you are going to try to either maintain or gain muscle mass, protein availability is very important, and if you don’t eat enough protein you are asking the muscle to grow without giving it the fuel,” he said.

Professor Hawley is available for interview.

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