

Eccentron Decreases Pain, Increases Strength and Function

in Clinical Trial at Regis University

REGIS  UNIVERSITY





“Eccentric exercise has the unique capability to generate the highest muscle force, and patients can grow stronger at the highest possible rate compared to other exercise. We wanted to see how effective it could be. But until very recently, there were no systems and few effective methods for performing eccentric exercise. That is, until BTE introduced the Eccentron.”

– Michael Bade, PT, DPT, Ph.D., OCS, COMT, FAAOMPT

Dr. Michael Bade is a physical therapist, PhD and Assistant Professor of the School of Physical Therapy at Regis University in Denver, Colorado. The School of Physical Therapy is nationally ranked and in the top 15 percent of physical therapy programs.

Dr. Bade became interested in the Eccentron after reading the encouraging results of previous research led by Paul LaStayo, P.T., Ph.D., CHT, using an early version of the Eccentron. But Dr. Bade noticed that no study had looked specifically at the effects of eccentric exercise in patients with knee osteoarthritis (OA).

Over 30 million Americans have knee osteoarthritis, and nearly 50 percent of individuals will develop knee osteoarthritis in their lifetime. Osteoarthritis is a rapidly growing problem and is the leading cause of disability in America today.

CLINICAL TRIAL BEGINS WITH BTE PARTNERSHIP

Dr. Bade knew he wanted to study eccentric exercise with patients with knee OA, but he had a very limited research budget and could only do the clinic trial if the equipment was donated.

“BTE has been very generous,” said Dr. Bade. “Not only did they donate an Eccentron for use in this trial, they donated a second machine for about nine months, and they donated all the time it took to install the equipment. They were highly supportive, easy to work with and very respectful of the scientific process.”

Together with fellow faculty researchers Wendy Anemaet and Amy Hammerich, Dr. Bade conducted a clinical trial in 2015 entitled “Efficacy of Eccentric Resistance Training in Persons with Knee Osteoarthritis.”

The study featured 33 subjects, aged 50 years or older, with knee pain and a minimum of 3 out of 6 EULAR criteria for knee OA. Subjects performed their assigned intervention on the Eccentron twice per week for 8 weeks for a total of 16 sessions. All patients were assessed at baseline and at the end of the intervention.



RESULTS

Decreased Pain, Increased Strength and Functionality

↑64%
STRENGTH INCREASE
in the hip extensors

↑40%
STRENGTH INCREASE
in the hip abductors

16%
STRENGTH INCREASE
in the knee extensors

“Many patients in this population think they are destined to degenerate, that they can’t get any better or any stronger. The Eccentron shows them that they are getting stronger.”

.1m
GAIT SPEED INCREASE
by 0.1 meters per second

.7sec
TIMED UP & GO TEST
improves by 0.7 seconds

2pt
KNEE PAIN DECREASE
on a 10 point scale

2sec
5X SIT TO STAND TEST
improves by 2 seconds

Overall the study concluded that “eccentric resistance exercise is safe and leads to positive improvements in pain, strength and function in persons with knee OA.”



ADDITIONAL BENEFITS

Real Time Feedback and Low Cardiovascular Demand

“One of the best things about the Eccentron is the real time feedback it gives patients on how they are performing,” said Dr. Bade. “We kept reassessing their maximum strength and then showed that tracking to the patients. They enjoyed seeing that. Many patients in this population think they are destined to degenerate, that they can’t get any better or any stronger. The Eccentron shows them that they are getting stronger.”

“An additional benefit is the low cardiovascular demand,” added Dr. Bade. “The Eccentron has been shown to be safe for patients with heart conditions or high blood pressure, which is important given the high number of individuals with heart conditions. By improving strength, patients can become more efficient in their daily activities further reducing cardiovascular demand.”

The research is continuing at Regis University. Today the team is adding more patients to the study and will be able to compare two different protocols against a control group. The team has submitted the study for presentation this summer and hopes to publish the findings within the next year.

“Some of the best results were the comments from the patients,” said Dr. Bade. “Things like how they are looking forward to going hiking that weekend or even skiing, or just how nice it is to walk down the stairs without pain. They are getting back to activities they couldn’t do previously.”

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