

# Health Insights Today

A SERVICE OF CLEVELAND CHIROPRACTIC COLLEGE

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## Exercise and Fitness Report

*When reading reports on new research, it is important to remember that no single study should be seen as providing the whole truth. The following reports offer helpful clues but in most cases further research is needed before firm conclusions can be drawn.*

### Resistance Training Helps Knee Osteoarthritis

Researchers at the University of Pennsylvania sought to determine the effect of a structured resistance training (RT) intervention on overall levels of moderate- and vigorous-intensity physical activity (MVPA) in 171 patients (74% women, 26% men) with early-onset knee osteoarthritis (OA). The study was a randomized trial that compared patients with early-onset OA who participated in an RT program, those who participated in a self-management (SM) program, and those who participated in both RT and SM. Participants in this study were 171 patients with knee OA. They had a mean age of 55.1 years, a mean body mass index of 27.6 kg/m<sup>2</sup>, and radiographic status of grade II OA (and no higher) in at least one knee, as defined by the Kellgren and Lawrence classification. They wore an accelerometer while awake for 5 to 7 contiguous days at baseline and at 3 and 9 months of intervention.

The participants engaged in MVPA a mean of 26.2 minutes per day at baseline. Both groups significantly increased their MVPA from baseline to 3 months (RT group by 18%), SM group by 22%), but only the RT group sustained those changes at 9 months. A significant group x time interaction for MVPA indicated that the RT group maintained higher MVPA levels than the SM group. The researchers concluded that patients with early-onset OA of the knee can engage in an RT program without sacrificing their overall MVPA levels. These results support the value of RT for management of knee OA.

Farr JN, Going SB, McKnight PE, Kastle S, Cussler EC, Cornett M. Progressive resistance training improves overall physical activity levels in patients with early osteoarthritis of the knee: a randomized controlled trial. *Phys Ther.* Mar 2010;90(3):356-366.

### Study Shows Exercise Aiding Bone Density and Fall Prevention

Physical exercise affects many risk factors and diseases and therefore can play a vital role in general disease prevention and treatment of elderly individuals and may reduce costs. Researchers in Germany sought to determine whether a single exercise program affects fracture risk (bone mineral density [BMD] and falls), coronary heart disease (CHD) risk factors, and health care costs in community-dwelling elderly women. They conducted a randomized, single-blinded, controlled trial with women 65 years or older who were living independently. In all, 246 women were randomly assigned to an 18-month exercise program (exercise group) or a wellness program (control group). The exercise group (n = 123) performed a multipurpose exercise program with special emphasis on exercise intensity; the controls (n = 123) focused on well-being with a low-intensity, low-frequency program. The main outcome measures were BMD, the number of falls, the Framingham-based 10-year CHD risk, and direct health care costs.

For the 227 women who completed the 18-month study, significant exercise effects were observed for BMD of the lumbar spine (mean percentage of change in BMD for the exercise group: 1.77% [1.26% to 2.28%] vs. controls: 0.33% [-0.24% to 0.91%]; femoral neck (exercise group: 1.01% [0.37% to 1.65%] vs. controls: -1.05% [-1.70% to -0.40%]; and fall rate per person during 18 months (exercise group: 1.00 [0.76 to 1.24] vs. controls: 1.66 [1.33 to

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1.99]. The 10-year CHD risk was significantly affected in both subgroups (absolute change for the exercise group: -1.96% [95% CI, -2.69% to -1.23%] vs. controls: -1.15% [-1.69% to -0.62%];  $P = .22$ ), with no significant difference between the groups. The direct health care costs per participant during the 18-month intervention showed nonsignificant differences between the groups, with costs marginally lower for the exercise groups. Researchers concluded that with a general wellness program, an 18-month exercise program significantly improved BMD and fall risk, but not predicted CHD risk, in elderly women. This benefit occurred at no increase in direct costs.

Kemmler W, von Stengel S, Engelke K, Haberle L, Kalender WA. Exercise effects on bone mineral density, falls, coronary risk factors, and health care costs in older women: the randomized controlled senior fitness and prevention (SEFIP) study. *Arch Intern Med.* Jan 25 2010;170(2):179-185.

## Recovery from Ankle Sprain Better with Early Exercise than RICE Protocol

Researchers at the University of Ulster in Northern Ireland compared an accelerated intervention incorporating early therapeutic exercise after acute ankle sprains with a standard protection, rest, ice, compression, and elevation intervention. In a randomized controlled trial with blinded outcome assessor at an accident and emergency department and university based sports injury clinic, with 101 patients with an acute grade 1 or 2 ankle sprain, participants were randomized to an accelerated intervention with early therapeutic exercise (exercise group) or a standard protection, rest, ice, compression, and elevation intervention (standard group). The primary outcome was subjective ankle function (lower extremity functional scale). Secondary outcomes were pain at rest and on activity, swelling, and physical activity at baseline and at one, two, three, and four weeks after injury. Ankle function and rate of reinjury were assessed at 16 weeks.

An overall treatment effect was in favor of the exercise group. This was significant at both week 1 (baseline adjusted difference in treatment 5.28) and week 2 (4.92). Activity level was significantly higher in the exercise group as measured by time spent walking, step count, and time spent in light intensity activity. The groups did not differ at any other time point for pain at rest, pain on activity, or swelling. The reinjury rate was 4% (two in each group). Researchers concluded that an accelerated exercise protocol during the first week after ankle sprain improved ankle function; the group receiving this intervention was more active during that week than the group receiving standard care.

Bleakley CM, O'Connor SR, Tully MA, et al. Effect of accelerated rehabilitation on function after ankle sprain: randomised controlled trial. *BMJ.* 2010;340:c1964

## Aerobic Exercise Decreases Oxidative Stress in Older Women

Researchers examined the effect of a yearlong exercise intervention on F2-isoprostane, a specific marker of lipid peroxidation and a general marker of oxidative stress. In a randomized, controlled trial, 173 overweight or obese, postmenopausal, sedentary women were randomized to an aerobic exercise intervention (60-75% observed maximal heart rate) for  $\geq 45$  minutes per day, 5 days per week, or to a stretching control group. Baseline and 12-month measures included: urinary F2-isoprostane, maximal O<sub>2</sub> uptake, body weight, body fat percentage, waist circumference, and intra-abdominal fat surface area. Urine samples were available from 172 and 168 women at baseline and 12-months, respectively.

Over the 12-month study, controls minimally changed maximal O<sub>2</sub> uptake (+0.2%) and body weight (+0.1 kg), whereas exercisers increased maximal O<sub>2</sub> uptake (+13.6%) and decreased body weight (-1.3 kg). F2-isoprostane

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increased slightly among controls (+3.3%) and decreased in exercisers (-6.2%), although the effect was not statistically significant. In planned subgroup analyses, F2-isoprostane decreased linearly with gain in maximal O<sub>2</sub> uptake relative to controls; exercisers who increased maximal O<sub>2</sub> uptake >15% decreased F2-isoprostane 14.1%. Researchers concluded that their findings suggest that aerobic exercise, when accompanied by relatively marked gains in aerobic fitness, decreases oxidative stress among previously sedentary older women, and that these effects occur with minimal change in mass or body composition.

Campbell PT, Gross MD, Potter JD, et al. Effect of Exercise on Oxidative Stress: A 12-Month Randomized, Controlled Trial. *Med Sci Sports Exerc.* Feb 4 2010.