

Study: Elderly Women can increase strength but still risk falls

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Research subject Ellen Prouty, 80, participates in a strength-building study conducted by Dain LaRoche, assistant professor of exercise science at UNH. Credit: Courtesy Dain LaRoche/UNH

Elderly women can increase muscle strength as much as young women can, a new study from the University of New Hampshire finds, indicating that decline in muscle function is less a natural part of the aging process than due to a decline in physical activity.

The research, published in the journal *Medicine & Science in Sports & Exercise*, compared strength gains of inactive elderly women and inactive young women after both groups participated in an eight-week training regime. Yet while the two groups increased similar percentages of strength, the older group was far less effective in increasing power,

which is more closely related to preventing falls.

"Power is more important than strength for recovery from loss of balance or walking ability," says Dain LaRoche, assistant professor of exercise science at UNH and the lead author of the study. Preventing falls, which occur in 40 percent of people over 65 and are the top reason for injury-related emergency room visits, is the driving force behind LaRoche's research agenda.

LaRoche compared the initial strength of 25 young (18 – 33) and 24 old (65 – 84) inactive women then had both groups participate in resistance training on a machine that targeted knee extensor muscles, which are critical for walking, stair-climbing, or rising from a chair. "They're what let you live on your own," he says.

After eight weeks of training, the older group not only increased their strength by the same percentage as the younger group, they achieved gained strength similar to a control group of young inactive women. But the older group's ability to increase power – force over time – was significantly less than the younger group's; the elderly women saw only a ten percent increase in power versus the younger women's 50 percent increase.

"It's somewhat troublesome that these older individuals had a reduced capacity to increase performance that's so closely associated with falls," says LaRoche. It seems that the key to muscle power in the elderly is to maintain it over the lifespan rather than try to develop it later in life, he says.

Acknowledging that the type or frequency (six sets, three times per week) of his training protocol may have affected the older group's ability to make gains in power, LaRoche is continuing to research older women's capacity to develop muscle power. As baby boomers age,

doubling the over-65 population by 2030, research that supports fall prevention and independent living is a growth area. "I tell my students, 'there's room for you in this field,'" says LaRoche.

Of those 40 percent of elderly people who will fall, research has shown that 20 to 30 percent suffer injuries that reduce mobility, independence and longevity. Health care cost of a fall injury totals nearly \$20,000, and following a hip fracture, life expectancy is just two years.

LaRoche's own interest in fall prevention in the elderly arose after helping his parents and sister care for his completely sedentary grandmother, helping her stay in her own home until she died at age 93. She broke both hips, lost six inches of height, and had osteoporosis so severe that a caregiver accidentally crushed several of her ribs just helping her out of a chair.

"There's a gap between life expectancy and quality of life in older age," LaRoche says. "We can improve that a lot with physical activity."

Source: University of New Hampshire

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