

# Program Improves Hip Fracture Outcomes

*Targeted intervention that includes progressive resistance training lowered mortality, dependency.*

BY DAMIAN McNAMARA

FROM THE ANNUAL MEETING OF THE GERONTOLOGICAL SOCIETY OF AMERICA

NEW ORLEANS – Compared with usual care after hip fracture, a comprehensive and targeted intervention that includes high-intensity progressive resistance training over 12 months lowers mortality, decreases nursing home admissions, improves activities of daily living dependency, and decreases the use of assistive devices, according to a randomized, controlled trial.

“It is possible to change the most important outcomes for these people,” Dr. Maria A. Fiatarone Singh said.

Functional dependency, however, did not significantly differ between groups.

Many facets of hip fractures have been studied, from pharmacologic prevention of osteoporosis to acute hospital interventions to fracture rehabilitation. “Although we’ve done a lot of studies, we still have not figured out how to prevent people from entering a nursing home or dying,” said Dr. Singh, professor of medicine and chair of exercise and sport science at the University of Sydney.

So Dr. Singh and her colleagues launched the Hip Fracture Intervention Trial (HIPFIT). They compared outcomes for 62 hip fracture patients randomized to resistance training and up to 12 other interventions vs. 62 patients randomized to usual care. Intervention was associated with an 84% reduction in the likelihood of nursing home admission (odds ratio, 0.16), compared with usual care, Dr. Singh said. In absolute numbers, 5 intervention patients (8%) and 12 control patients (19%) were admitted to a nursing home during the 12 months of follow-up.

“Hip fracture is associated with chron-

ic pain, reduced mobility, disability, and increasing degree of dependence. After hip fracture, 10%-20% of formerly community-dwelling people require long-term nursing home care,” Dr. Singh said.

Four intervention patients and eight usual-care patients died. Age-adjusted risk of death was significantly reduced in the intervention group, compared with usual care (OR = 0.19). Cardiovascular disease, infection, and stroke were among the causes.

Dr. Singh and her associates hypothesized that long-term disability and nursing home utilization after hip fracture would be reduced by targeted, multifactorial intervention aimed at the primary risk factors. They chose modifiable risk factors to make application of their findings more practical, including sarcopenia/muscle weakness, poor balance or gait, malnutrition or weight loss, vitamin D insufficiency, and vision concerns.

All intervention group participants received hip protectors and supervised, high-intensity, progressive resistance training for 12 months. The protocol included seven exercises designed for both upper and lower body strength. A meeting attendee questioned how patients were able to exercise after hip fracture. The intervention began with an isometric measure of strength and actual strength training started about 6 months after fracture, Dr. Singh replied.

Balance training exercises were progressive as well. As tasks were mastered, participants graduated to a more difficult level. For example, if a person could balance holding on to something with two hands, next they progressed to one hand and then to one finger.

Interventions were added for individual participants as needed, up to a total of 13.

Treatment of depression, nutritional supplementation, medication management, and vision assessment are examples. Some participants received home assessment and referral to community services. Others received interventions to address risk and/or fear of falling, low self-efficacy, and polypharmacy.

Evaluations were done at baseline and at 4 and 12 months after fracture, with regular review by geriatricians, general practitioners, and ophthalmologists.

A meeting attendee asked which interventions were most useful. “Our specific intent was not to break apart the 13 interventions,” Dr. Singh said. She said many were intertwined, for example, vision improvements allowed balance training to be more effective. The effects of strength and balance training were most robust because they were performed twice a week for 12 months.

Usual care included 6-12 weeks of physiotherapy, an orthopedic consult at 6 weeks, and any recommended therapies. “We sent letter to general practitioners if people [in the usual-care group] were depressed, had low vitamin D, or abnormal cognitive function. We did not prescribe for this group,” she said.

Even though overall functional dependency did not differ significantly, intervention was associated with significantly less decline in some functional dependency KATZ scores (total, continence, and transfer) at 12 months, compared with their prefracture baseline. This is relevant, Dr. Singh said, because previous research they did showed that overall function declines for most people after a hip fracture. Only 20% of participants in the Sarcopenia and Hip Fracture Study (SHIP) returned to baseline function at 12 months (J. Gerontol. A. Biol. Sci. Med.

Sci. 2009;64:568-74). In the current study, after the researchers controlled for age, there was less of a decline in function for total KATZ score, transfer change, and continence change if patients were in intervention group vs. usual care, according to Dr. Singh.

“Did changes in KATZ activities of daily living total score and scales mediate the nursing home admissions we saw? It seemed to be the case,” Dr. Singh said. “The nursing home residents had greater decline in KATZ function and toileting [continence] scores vs. others.”

All results are based on an intent-to-treat

## VITALS

**Major Finding:** Age-adjusted risk of death was significantly reduced in the intervention group, compared with usual care (odds ratio = 0.19).

**Data Source:** The Hip Fracture Intervention Trial (HIPFIT) compared outcomes for 62 hip fracture patients randomized to resistance training and up to 12 other interventions versus 62 randomized to usual care (6-12 weeks of physiotherapy, an orthopedic consult at 6 weeks, and any recommended therapies).

**Disclosures:** Dr. Singh said she had no relevant financial disclosures.

analysis. The dropout rate was low, she said: nine HIPFIT patients and three usual-care patients did not complete follow-up.

At baseline, the community-dwelling participants were 69% female; mean age, 79 years; 83% at nutritional risk; 88% vitamin D insufficient; 90% living independently (vs. 10% in nursing homes); and 38% were cognitively impaired. A total 45% were depressed. The mean number of chronic diseases was 3.4. The usual-care group reported worse bodily pain, the only significant difference between groups. There were no adverse events, except for some musculoskeletal soreness after activity. ■

# Digital X-Ray Radiogrammetry Shows Minute Bone Loss in RA

BY DENISE NAPOLI

FROM THE ANNALS OF RHEUMATIC DISEASES

Hormone therapy stabilized bone loss over a 2-year period in rheumatoid arthritis patients, as measured on digital x-ray radiogrammetry, a study has shown.

The study is important not only for finding that hormone therapy

(HT) was effective, but because it depended on readings that detected losses of as little as 0.36%.

In contrast, plain radiographs, “the standard method for detection and quantification of joint destruction in RA,” cannot detect bone loss of less than 30%, wrote Dr. Helena Forsblad-d’Elia and Dr. Hans Carlsten (Ann. Rheum. Dis. 2010 Nov. 3 [doi: 10.1136/ard.2010.137133]).

Dr. Forsblad-d’Elia and Dr. Carlsten, both of the center for bone and arthritis research at the University of Gothenburg (Sweden), looked at 88 postmenopausal women with radiographic joint destruction due to rheumatoid arthritis. Findings from earlier research by Dr. Forsblad-d’Elia has shown that RA is strongly associated with generalized osteoporosis (Ann. Rheum. Dis. 2003;62:617-23).

Patients were randomized to one of two groups. The first received HT, which consisted of estradiol and norethisterone acetate, plus a daily dose of 500 mg calcium and 400 IU vitamin D. Controls received only the calcium and vitamin D.

Patients had digital x-ray

radiogrammetry–bone mineral density (DXR-BMD) readings at baseline and at 2 years. A total of 50 women (23 HT patients, 27 controls) were ultimately included in the study analysis. The mean age of both groups was roughly 58 years, and both groups had a mean disease duration of greater than 10 years.

According to the researchers, at baseline, HT patients and controls had an identical mean DXR-BMD reading of 0.45 g/cm<sup>2</sup>; HT patients had a standard deviation of 0.096, vs. 0.081 in the control group.

Two years later, HT patients’ mean reading was identical except for a tiny increase in the standard deviation, to 0.097, whereas control patients’ mean DXR-BMD was 0.44, with a stan-

dard deviation of 0.084. The minute difference was insignificant for the HT group, but significant for controls, both in terms of change from baseline and difference from the HT group. Put another way, the decrease among HT patients from baseline was 0.36%, while the decrease from baseline for controls was 3.74% – more than 10 times greater.

“DXR-BMD has been proposed to be an outcome measure in monitoring treatments in early RA, and can predict future radiographic joint damage,” concluded the authors. Based on the current data, however, “we suggest that DXR-BMD could serve as an outcome measure in [randomized controlled trials] in longstanding RA,” they wrote. ■

## VITALS

**Major Finding:** Digital x-ray radiogrammetry detected small but significant bone loss in a group of postmenopausal women, compared with women receiving hormone therapy.

**Data Source:** A 2-year, single-blind, randomized controlled trial of 88 postmenopausal women with rheumatoid arthritis.

**Disclosures:** Dr. Forsblad-d’Elia and Dr. Carlsten said this study was supported by several grants from rheumatology and other foundations; they added that they had no competing interests to disclose.