

A photograph of a person sitting in a wheelchair, wearing a white shirt, brown trousers, and brown sandals. They are holding a wooden cane. The background is a plain, light-colored wall and a tiled floor.

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HIP FRACTURE RESEARCH:

Enabling the Disabled

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Hip fracture, a sudden intrusion into personal and family life, has been synonymous with an end to mobility and pain-free activity. However, while still a severe threat to one's health, research being conducted by Maryland's department of epidemiology and public health, under the direction of Jay Magaziner PhD, MSHyg, professor and chair, and director of the school's center for research on aging, and Denise Orwig, PhD, associate professor, department of epidemiology and public health, are providing insights that are expected to improve both care and outcomes for fracture victims.

The hip fracture research program is part of the center for research on aging and the University of Maryland Claude D. Pepper Older Americans Independence Center. Describing the program's initiative, Magaziner says, "Our emphasis is on what we call enablement. There are numerous groups working to determine how people fracture their hips. We're focused on enabling people who are already disabled, and determining what can be done to help them improve their conditions."

Maryland's Baltimore Hip Studies (BHS) program, directed by Orwig, is an interdisciplinary research initiative on hip fracture recovery primarily funded by the National Institute on Aging. Its research has been ongoing since 1983, and today its 25 participating hospitals compose the largest hospital research network on hip fracture in the world. Its programs, which number among the most cutting-edge worldwide, began with observational

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By Rita M. Rooney

Enabling the Disabled



aspects of recovery and led to more recent work, determining how the consequences of hip fracture for men who were once considered unlikely candidates for fracture, may differ from those among women.

The BHS program's efforts center on the 260,000 hip fractures that occur yearly in the United States, and the 1.6 million worldwide. The team examines everything that happens in the

lives of those affected—how they walk, and how they carry out daily activities. Researchers look at bones and muscles, all the physiological

effects of fracture. Nothing that may have any bearing on a patient's recovery is overlooked.

Magaziner's achievements on hip fracture are applauded worldwide. A recipient of two consecutive method to extend research in time (MERIT) awards from the National Institute on Aging, he co-led an international clinical trial involving 148 sites, testing the use of Reclast following hip fracture. The trial resulted in significant reductions in both refracture and mortality, and Reclast as well as other drugs in its class have since become standard in hip fracture treatment.

"Unfortunately, only about 20 percent of patients take this or another similar drug in its class," Orwig says. "Any fears about side effects have not been met and

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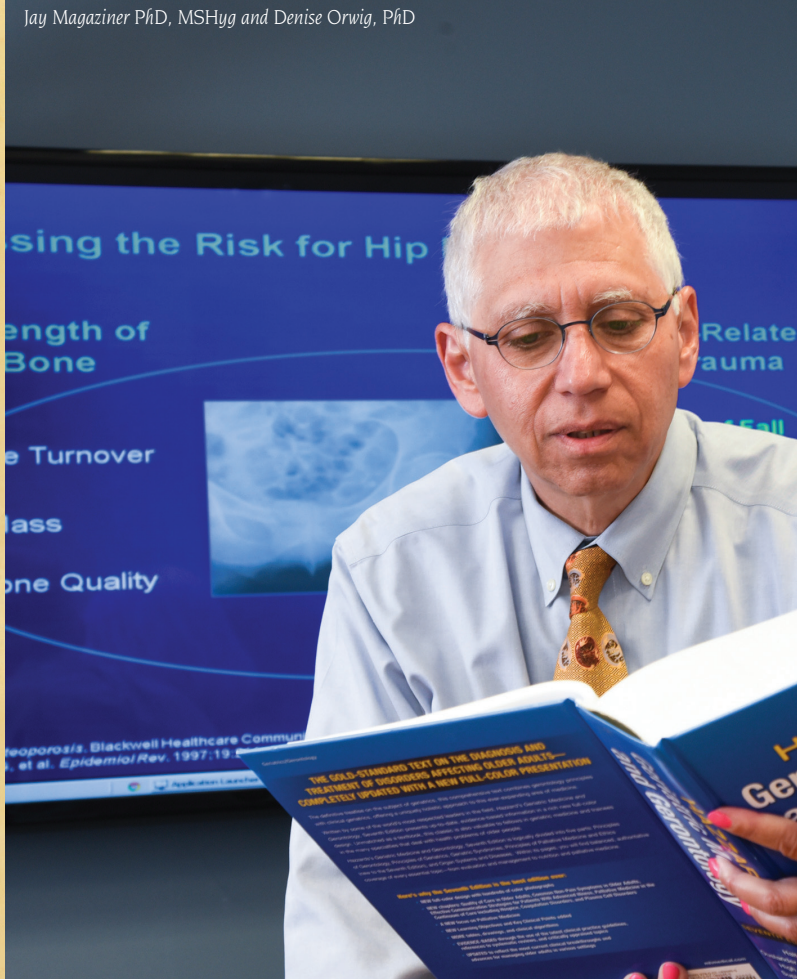


Photo by Richard Lippenholz

yet doctors are not prescribing it. It's unfortunate because the drug has been well tested and we know it can help preserve bone." She adds that anyone who has had a hip fracture should be taking a bone active medication to increase bone density and possibly avoid future fracture.

"Our goal is to improve recovery throughout the world," Magaziner says, referencing his role on the board of directors of the international consortium, the Fragility Fracture Network, an organization with a worldwide commitment to improving care for patients with fracture by sharing conclusions from scientists globally.

One hip fracture project at the University of Maryland currently being conducted is a large multi-center clinical trial of a home delivered physical therapy regimen on the ability to walk again in the community. The study is led by Magaziner and physical therapist Rebecca Craig, PT, PhD, FAPTA, professor and dean of the college of health sciences at Arcadia University. Maryland has a multi-million dollar grant from the National Institute on Aging and the Community Ambulation Project (CAP) for which final



The geriatrician's role in treating attendant medical complications is critical, especially in the presence of specific risk factors including dementia, chronic cognitive impairment, advanced age, sleep deprivation, and other conditions that may or may not have been present prior to the fracture.

results are expected in the Fall 2017.

"Right now, about 50 percent of patients are not able to walk one year after fracture," Magaziner says. "We're determined to change that."

Magaziner reports that, generally, post-operative care for fracture patients takes place within four to six weeks following surgery. The CAP initiative begins when that care ends, a strategy explained by the program's emphasis on the length of the recovery period.

"We believe patients continue to recover for a long time," Magaziner says. "So we want to begin our interventions later, thereby helping patients to recover after the initial healing period is over."

Another important difference that benefits patients is that care is provided by physical therapists in the patient's home. "Expecting patients to travel downtown for therapy when they are in discomfort and possibly pain can limit their willingness to receive care," Magaziner says.

"Our program translates what can be done in the clinic to home care."

Responding to the challenge, Orwig, who is director of CAP's clinical coordinating center, reports the team has been involved in several observational and randomized controlled trials to evaluate the consequences of hip fracture and assess the effectiveness of interventions to increase bone density, strength, and function, all of which are compromised by the fracture.

While one BHS researcher studies the status of bone fracture on muscles, another oversees work on aerobic ability and exercise. There are those who look at inflammation and the genetic factors in recovery, the impact of fracture physiologically throughout the entire system, and the effects of the fracture on walking ability, delirium, dementia, depression and social interaction. A relatively new component in the program addresses the problem of imbalance in patients who have suffered fracture. In a new program, Mark W. Rogers, PhD, PT, professor and chair, physical therapy and rehabilitation science, is assessing specific reasons behind functional disability by investigating neuro-motor, biomechanical, and musculoskeletal mechanisms contributing to balance problems among patients.



Mark W. Rogers, PhD, PT

Many people who break their hips live alone, often complicating the injury. "Too often, a patient falls and isn't found for some time," Orwig says, adding that those who do not have surgery generally are those unable to survive the procedure. Often, dementia is an added impediment to recovery.

Looking ahead, Orwig, who also serves as co-director of the university's doctoral program in gerontology, is leading a study on how a patient's hip fracture affects the lives of those caring for them.

Another study recently conducted by the research team compared male and female fracture patients. Women gener-

ally fracture in their post-menopausal years when they begin to lose bone, become weaker, and fall. In men, the causes of bone loss sufficient to cause fracture are not as evident.

Researchers conclude that both men and women who suffer hip fractures have significant changes in body composition, have low bone mass, osteopenia, or in more severe cases, osteoporosis. Since they already have a decline in bone density when they break their hips, their bone loss is compounded. Among significant changes occurring over a 12-month period are weight loss, loss of muscle mass, and imbalance. Following fracture, both men and women can lose three to five percent of their bone. When compared with a group of women of similar age and bone density who did not fracture, women suffering fracture showed that their loss of bone mineral density was more than 10 times greater than might be expected from aging.

Comparatively, the study indicates that men are at increasing risk and their number is expected to double by 2040. Men in the study suffered fracture somewhat younger than women and, as a rule, are sicker than women when they do so. They experienced a greater decline in bone than women in the study and, over the years, lose an excess of bone over men who do not fracture. In addition, male mortality within a year was as high as 33 percent, twice that of females.

Orwig points out that the results of the study emphasize information previously unknown because of the unavailability of male patients for in-depth study. A companion study of cognitive ability showed a significantly lower aptitude at the time of fracture among men, along with a decrease in cognitive functioning over the following year.

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“It’s frustrating to those of us working in this field to hear that hip fractures are decreasing in incidence,” Orwig says. “It isn’t true unfortunately. The rate of fracture may be decreasing. A larger number of people turn 65 every day because of longer lifespans. So while the rate of fracture may be decreasing, the actual numbers are not.” She adds that studies on hip fracture are well founded. Whereas people may disregard some medical problems, almost 100 percent of those with fracture get medical attention. It’s not something people ignore, so there are verifiable statistics available.

Researchers conclude that geriatricians can be important in restoring fracture patients to improved health. The geriatrician’s role in treating attendant medical complications is critical, especially in the presence of specific risk factors including dementia, chronic cognitive impairment, advanced age, sleep deprivation, and other conditions that may or may

not have been present prior to the fracture.

It’s evident that life expectancy plays a negative role in the incidence of fracture. In 2010, approximately 260,000 people in the United States, 65 years of age and older, were hospitalized for hip fracture. By 2030, that number is expected to reach 289,000. Since the average age of a fracture patient is 82, these projections suggest 19 percent of women and 12 percent of men who reach 85 will suffer hip fractures.

Are outcomes of hip fracture improving on a national and international scale? Magaziner and Orwig say they hope so. Certainly, patients demonstrate better physical functioning, but hip fracture is still ranked as one of the top 10 causes of disability. It is still a central event in the life of an older

person. Many who were living independent lives until the fracture still need assistance with daily living a year later.


Orwig cites improvements in medical management—smaller incisions for surgical procedures, implants, shorter hospitalization, and improved management of infections.

“However, there is still a significant decline in bone mineral density and in functioning a year later,” she says. “There is still a need to improve care once a patient leaves the hospital. We’re hoping our current studies will shed light on the necessary next steps.”

Magaziner adds “No single intervention will solve the problem of hip fracture. Surgeons can fix the bones, but it’s up to others to provide physical rehabilitation, treatments for delirium and depression, and medications.”

He adds that it is critical to find more ways to ensure that patients remain active and socially engaged after their fracture. He says the problem of getting all the different pieces together for better care is an enormous one that demands a tremendous amount of collaboration and coordination among providers from multiple social and medical disciplines, along with those who deliver the methods by which care systems operate.

“As care delivery systems for hip fracture change to improve outcomes at reduced costs, there is a need to design interventions and rapidly evaluate their cost-effectiveness, Magaziner concludes.

In the meantime, the Maryland’s center for research on aging through its hip fracture program and the Baltimore Hip Studies initiative, continue to engage in groundbreaking interdisciplinary research on hip fracture recovery. 



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