

Hip Protectors -- A Breakthrough in Fracture Prevention

Hip fractures are one of the most devastating and costly problems commonly faced by elderly people. Each year in the United States, more than 300,000 people 65 years old or older are hospitalized because of hip fractures, (1) and about a quarter of these people survive for less than one year because of the fracture or its complications. (2) Of those who survive, most have substantial reductions in their ability to function in daily life and in their ability to walk, and a sizable minority are living in long-term care institutions by the end of the year after injury. (2)

Most previous attempts to prevent hip fractures have focused on reducing underlying causes and risk. Hip fractures usually result from two interacting processes: a fall or other traumatic event resulting in direct impact to the greater trochanter and an underlying weakness in the bone caused by osteoporosis. Each of these processes has underlying risk factors that have been reasonably well studied. The leading risk factors for falls in older adults include weakness, gait and balance disorders, functional impairment, visual impairment, cognitive impairment, and the side effects of drugs, together with the presence of hazards in the environment, such as icy pavements or objects on the floor. Multifactorial assessments of risk, combined with targeted interventions such as exercise programs and inspection and control of hazards in the living environment, can significantly reduce the incidence of falls, by 10 to 30 percent, but these measures do not prevent the majority of falls. (3,4,5,6) The second key process underlying hip fractures, osteoporosis, can be treated with a variety of medications, such as estrogen, calcium, vitamin D, and bisphosphonates. However, these interventions also provide only partial protection. Clearly, reducing the risk of falls and the risk of osteoporosis is only part of the solution to the problem of hip fractures; other approaches are needed.

In 1993, Lauritzen et al. reported the results of a clinical trial that tested just such a different approach. (7) In 10 Danish nursing homes randomly assigned either to provide all their ambulatory residents with impact-absorbing hip protectors for routine use or to give all their ambulatory residents usual care, the rate of hip fracture after 11 months of follow-up was 53 percent lower in the hip-protector group. Even more impressive was that none of the subjects who did have a hip fracture were actually wearing hip protectors at the time of fracture -- a finding that both magnified the potential size of the effect of this intervention and pointed to an important limitation, which is the difficulty in convincing people to wear the protectors consistently.

These results were received with great excitement, and there was clamor to see them reproduced. However, the results were also met with some skepticism because of the large effect as well as the open design inherent to this kind of study, in which both the subjects and the investigators are aware of the study assignments. Furthermore, the base-line rate of hip fracture in these Danish nursing homes was high -- many times higher than in the United States -- perhaps because of a greater prevalence of osteoporosis in Scandinavia. Nonetheless, the study was widely cited, and companies worldwide began manufacturing and marketing hip-protector devices. It soon became apparent that most elderly people were not yet sufficiently concerned or motivated to endure the inconvenience of wearing hip protectors. Relatively few are currently in use, although some nursing homes have begun using hip protectors as part of programs aimed at preventing falls and injuries. Confirmatory data have been urgently needed. The results of a small Swedish study appeared to confirm the findings of the Danish study, (8) but until now, no large-scale studies have been published.