

Labs invite volunteers to lose their footing

Slips not problem just for the elderly

By Malcolm Ritter

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PITTSBURGH — Richard Grove, 73 years old and a robust 6 feet tall, set out with confident strides across a laboratory floor the other day. His first five steps went great.

Then his left foot hit a slippery

patch and skidded. His arms windmilled over his head as if he were throwing a baseball with each hand. His right foot shot forward to come even with his left. But he quickly regained his balance and kept on walking.

This was no accident. Grove had just slipped for science.

Millions of years after our ancestors started walking upright, researchers are looking for better ways to keep us from falling down.

And at this University of Pittsburgh lab, hundreds of volunteers like Grove — who was protected from falling by a special harness — have skidded their way into that effort.

The stakes for such research, specialists say, are enormous.

Last month's death of novelist Kurt Vonnegut, 84, who had fallen in his home, underlines the dangers of taking a spill. In fact, about a third of Americans 65 and older

fall each year, the federal government says.

In 2003, for example, some 1.8 million people over 65 were treated in emergency rooms after falling, and about 13,700 died.

But falling is not just a problem of the elderly. In the workplace, about a quarter-million workers each year suffer injuries from falls that are bad enough to make them take time off, according to the US Department of Labor. That costs billions of dollars. Even without hitting the ground, some 30,000 employees suffered sprains or strains from the wrenching experience that made them lose work-days in 2005.

And as the workforce gets older, the age-related problems of falling are starting to gain prominence on the job, says Mark Redfern, codirector of the University of Pittsburgh's Human Movement and Balance Laboratory. That's where Grove was tested.

Mark Grabiner of the University of Illinois in Chicago and a colleague recently sent 52 old and young adults for a stroll over artificial ice, to see what reactions make a difference between falling and just wobbling.

Two things stood out. People who were able to slow down the slipping foot were more likely to recover, Grabiner said. More surprising was a finding about the other foot. The crucial thing about its placement is how far to the left or right from the center it is.

Study analysis implies that "if I can improve the location of that foot in the sideways direction by only four centimeters [about 1.5 inches], I increase the likelihood of this person recovering by 50 percent," Grabiner said.

But can people be trained to react differently to an event that happens so quickly and unexpectedly? Grabiner said he's had success in training older women to keep from falling after tripping. So he believes the new data will help his efforts to train older men to recover from slips. In fact, studies suggest people who've practiced recovery moves can improve their reactions to slipping, Cham said.

There are many ways to fall, of course, but slipping is a prominent cause of workplace injury. And by some estimates, half to two-thirds of falls in the elderly come from slipping or tripping. It was a spill on an icy sidewalk in 2003 that led to the death of Dr. Robert Atkins, 72, the diet guru, for example.

At the Pittsburgh lab and maybe a dozen others of similar scale worldwide, scientists are still scrutinizing some basic questions about that distressingly common experience:

- Exactly how do some people save themselves from falling?

- How does aging affect that response?

- Can older people be trained to recover from a slip without falling?

Slipping research focuses on a very brief moment. Raki Cham, codirector of the Pittsburgh lab, says a severe slip leaves only about a quarter-second to save oneself from falling.

How do you do that?

One-tenth to two-tenths of a second after your foot hits a slippery spot, she said, your knee and hip joints react to try to bring the skidding foot back. And you try to push your hip forward to regain your balance.

If that doesn't work, you whip your other foot forward, just as Grove did in the lab. That happens between about one-fifth and one-quarter of a second after the skid starts.

"If you're a little late," Redfern said, "you're way late."

And if it doesn't work, you're going down.

It sounds simple, but scientists are still unraveling the details.