Structural integrity is something most of us take for granted. Walk across a floor, and you probably don’t consider whether it will collapse. Drive down the freeway, and you likely don’t think about the wheels falling off your car. But even if we avoid thinking about it, floors rot. Car parts rust. With osteoporosis, the human skeleton is quite similar.

Sometimes called a silent disorder because it is too often undiagnosed and untreated, osteoporosis is characterized by a gradual loss of bone mass and density. This loss, while not immediately apparent to patients, can ultimately lead to debilitating fractures of the spine, hips, and other bone structures. For older patients, these fractures can be life changing, leading to reduced mobility and independence; in the worst cases, they can be life ending. Unfortunately, those worst cases are all too common.

Porous pores beget broken bones

The Latin roots of the word osteoporosis reflect the roots of the disorder itself: osteo, or “bone,” and porosis, or “porous condition.” Anything porous is less dense, less heavy, and less strong—and, therefore, that much easier to break.

The first manifestation of the silent disorder is often a fracture of the bone, most commonly in the spine, hip, arm, or pelvis, says Nelson B. Watts, MD, director, Mercy Health Osteoporosis and Bone Health Services in Cincinnati. Fractures in the hands, feet, or skull are probably not indicative of osteoporosis, adds Dr. Watts, while fractures in the elbows, knees, or shoulders may be. Based on the patient’s profile and risk factors, follow-up testing of bone density and treatment may be needed.

These risk factors include being female, older than 50, and postmenopausal, notes Kent Jason Lowry, MD, an orthopedic sports medicine surgeon with Northland Orthopedics, quality improvement chairman at Ministry Saint Mary’s Hospital in Rhinelander, Wisconsin, and spokesperson for the American Academy of Orthopedic Surgeons. Dr. Lowry notes that white and Asian women are at higher
As the average age of Americans continues to increase, the rates of osteoporosis rise as well. By 2020, 1 in 2 Americans 50 years of age and older will have or be at risk of developing osteoporosis of the hip, and even more will be at risk of developing osteoporosis of any part of the skeleton.

Compounded with the pain and suffering for the individual patient, the financial fallout from osteoporosis is significant as well. A 2004 report from the surgeon general concludes “annual direct care expenditures for osteoporotic fractures range from $12 billion to $18 billion per year in 2002 dollars. Indirect costs (e.g., lost productivity for patients and caregivers) likely add billions of dollars to this figure.” The report also warns that these costs will increase two- or threefold in the coming decades.

As a silent disease, osteoporosis may not be apparent in a given patient until a fracture occurs—and a fracture can be life changing—“not a bump in the road, a total wreck,” says Dr. Watts. Patients with hip fractures often die from hospital-acquired infections, pneumonia,
embolisms, deep vein thrombosis, or other side effects. In addition, he adds, “Twenty percent of hip fracture survivors become nursing home residents, and only 50 percent of them return to fully independent living.”

For most of a person’s life, routine trips and falls do not result in hip fractures, notes Dr. Lowry. A car crash or, say, a fall from a significant height is more likely the cause of such a fracture. However, as people age and bone density decreases, a trip and fall in the bedroom may very well lead to a broken hip—which, in turn, contributes to the spiral of comorbidities noted previously. “Just by having a hip fracture, you increase your mortality rate from 15 percent to 33 percent in the first year,” notes Dr. Lowry. The fact that such patients are generally older and less active only emphasizes the serious nature of osteoporotic fractures.

The primary goal of treating osteoporosis, then, is to prevent fractures. In fact, “Having osteoporosis doesn’t really matter unless you sustain a fracture,” states Julie Switzer, MD, assistant professor of orthopedic surgery at the University of Minnesota and director of geriatric trauma at Regions Hospital in St. Paul, Minnesota. “If we can help prevent fractures in folks that have compromised bone health, we’d be doing a great service.”

**Stand and be recognized**

One basic tool that can aid diagnosis during a primary care visit is the stadiometer, which measures human height, notes Dr. Watts. Patients should be instructed to remove foot wear and stand with their backs to the wall, in order to ensure an accurate measurement. By regularly recording this information, providers can monitor any decrease in height, which may be caused by the characteristic stooping of the spine seen in osteoporosis.

A more sophisticated diagnostic test is DEXA, or dual energy X-ray absorptiometry, which is performed by a radiologist. A simple, noninvasive, and painless test, DEXA exposes the patient to no more radiation than a transcontinental flight, says Dr. Watts. The test uses two X-ray beams to measure bone marrow density at specific areas (generally the hip and spine) and compares those measurements to averages based on the patient’s age, adds Dr. Lowry. Patients who are one or two standard deviations below the norm for their population are considered at risk of developing osteoporosis.

If the bone density levels are within normal ranges, retesting is not needed for five to 10 years, or sometimes not needed at all, says Dr. Watts. If the patient has osteoporosis, however, annual testing is needed to measure the effectiveness of the treatment regimen. Medicare covers DEXA, which should be performed on women at age 65 and on men at age 70, except in the case of higher-risk patients.

**Boons for bones**

Throughout childhood, adolescence, and into a person’s 20s, the generation of new bone tissue exceeds the loss of old tissue in healthy individuals. As we age, however, this cycle gradually reverses, and osteoporosis may develop. Therefore, young people must establish lifestyles that promote development of healthy, dense bones, as a way to forestall the inevitable decline in bone tissue.

A preventive approach and early intervention improves patients’ odds. As Dr. Watts notes, older individuals are less likely to change their habits.

Concerning osteoporosis specifically, patients should be coached to address modifiable risk factors through lifestyle changes. These general health practices are important for everyone, of course, but especially important for individuals with osteoporosis, says Dr. Watts. Such practices include the following:

- Increased activity
- Weight-bearing activity
- Healthy eating (with particular attention to vitamin D and calcium)
- Tobacco and alcohol avoidance

Weight-bearing activities are those that stress the muscles and joints, and require one to work against gravity. A few examples include walking and weight lifting, as well as tai chi and yoga. Meanwhile, swimming, water aerobics, and biking are non-weight-bearing activities, although they do promote overall good health, of course.

**Body of drugs**

Once osteoporosis develops or becomes evident (i.e., when a fracture occurs), more targeted interventions are indicated. A number of medications are available for treatment; most commonly, these are the bisphosphonates, which include the following:

- Alendronate (Fosamax)
- Risedronate (Actonel)
- Ibandronate (Boniva)
- Zoledronic acid (Reclast)

In the past, hormones, such as estrogen and hormone-like medications, were prescribed for osteoporosis. Recent studies, however, have implicated estrogen replacement therapy in women as a factor for increased risk of heart attacks and some types of cancer.

These pharmaceutical treatments, known as antiresorptive medications, slow the amount of bone loss. Anabolic drugs, meanwhile, actually increase the rate of bone formation. Currently, teriparatide (Forteo) is the only anabolic drug approved by the U.S. Food and Drug Administration. The drug is administered by daily self-injection, for a maximum of two years. Use of this medication can reduce risk of fractures by up to 70 percent, and is effective within six to 12 months of treatment, notes Dr. Watt.

The current state of osteoporosis treatment through pharmaceuticals is good, but could be better, notes Dr. Switzer. “We are always working to improve the medications that we have. As a body of drugs, they have helped prevent millions of fractures, but each of the medications has side effects, so we are working on the development of medications that have the same benefits but fewer of the side effects.” For example, a common side effect of bisphosphonate pills is an upset stomach or heartburn.
The good news on osteoporosis drugs is that, through advanced and continued monitoring of at-risk patients, the physician can watch and wait until bone mass density has declined before actually prescribing a given medication. “I can wait another 30 to 35 years [from initial diagnosis] because the drugs are so effective and fast acting,” says Dr. Watts. “Once the patient has reached the point where risk is high enough, we need to keep doing something on an indefinite basis.” At the same time, he adds, the medications accumulate in the body, so after a few years of treatment, a “drug holiday” could be instituted, until the reservoir runs out and bone mass density declines, at which point the treatment has to be restarted.

**Breaks in communication**
Orthopedic surgery to repair a fracture, while needed, treats the results of osteoporosis, but not osteoporosis itself. To address the root causes of the condition, health professionals must play a role in helping diagnose possible onset of the disease and counsel patients accordingly. In addition to healing the fracture, the orthopedic surgeon should follow up with the patient’s primary care physician to ensure testing for osteoporosis, says Dr. Lowry.

Unfortunately, adds Dr. Watts, that management may not occur. Approximately 1 in 4 patients obtain the appropriate post-fracture testing and treatment. Even among those who do obtain a prescription, up to 30 percent never have the prescription filled—and fewer than half who fill that prescription are still taking their medication a year later. When asked why, he says, patients generally respond that they did not get enough information about the treatment, did not fully understand the benefits, or heard about possible side effects.

This highlights the need for clear and active communication, Dr. Watts says. “Nothing in life is completely risk-free, but for these patients [with osteoporosis risk factors], the benefits far outweigh the risks. We can usually come up with something that is safe, tolerated, and effective.”

**Joint efforts**
“A lot of the work [for these patients] can be done by folks who are not necessarily physicians,” says Dr. Switzer. Medical assistants in particular can take on that work. They can follow up with patients who have sustained a fracture to inform them of the risk of another fracture and communicate with patients on risk-factor remediation.

Males make up only 20 percent of individuals with osteoporosis. Despite the relatively low incidence, men who sustain an osteoporotic fracture “have a considerably higher mortality rate than a woman of the same age and similar comorbidities,” notes Dr. Switzer. This increased rate should lead to a higher sense of urgency in treating male patients with osteoporosis.

A final piece to the puzzle is ensuring collaboration among all members of the health care team. “There is no question that the best care for bone health issues includes significant collaboration between orthopedic surgeons, primary care physicians, possibly endocrinologists, nutritionists, [and] physical therapists,” Dr. Switzer says. “It really is an opportunity for excellent provider communication and collaboration.” Medical assistants can help ensure these connections are made so that patients get the care they need and this silent disease gets the attention it deserves.

**References**