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## CONSEQUENCES OF OSTEOPOROSIS AND SPINAL FRACTURES FACT SHEET

### Background on osteoporosis<sup>1</sup>

- **Definition:** Osteoporosis is a disease characterized by low bone mass and structural changes that gradually weaken bones, making them fragile and more prone to fracture.
- **Incidence/Prevalence:** Ten million Americans (80% women and 20% men) have osteoporosis. It is estimated that nearly 44 million more have low bone mass and are at risk for developing osteoporosis. One in two women and one in four men over age 50 will have an osteoporosis-related fracture in their remaining lifetime.
- **Symptoms:** Bone loss occurs without symptoms, making osteoporosis a “silent disease.” Many people do not realize they have osteoporosis until they have a fracture. Fractures can cause pain or occur without pain.
- **Fractures:** Osteoporosis causes more than 2 million fractures each year in the U.S.
- **Detection:** Bone density tests can detect osteoporosis, help predict risk for future fracture and measure the degree of bone loss. X-rays are usually the first diagnostic test done to determine if a spinal fracture has occurred.
- **Prevention:** Peak bone mass is acquired during the first two decades of life. The critical years for building bone mass begin in adolescence, peaking at about age 30 in women. From about age 30 onward, there is a steady loss of bone mass of 1 -2 percent that accelerates to 2 -3 percent per year at menopause. The best prevention for osteoporosis is to build strong bones (maximize peak bone mass) during childhood and early adulthood. Prevention consists of a combination of adequate calcium and vitamin D intake, weight-bearing exercise and healthy lifestyle, including avoiding smoking and excessive alcohol intake.
- **Medications:** There is no cure for osteoporosis, but medications in several categories have been approved by the U.S. Food and Drug Association (FDA) to treat osteoporosis: hormone replacement therapy (for post-menopausal women), selective estrogen receptor modulators, bisphosphonates, teriparatide and calcitonin. New drugs are under investigation.
- Over 80% of spinal fractures are caused by osteoporosis, whereas only a small percentage are caused by diseases such as cancer or localized bone disease.<sup>4</sup>
- Patients with painful spinal fractures have traditionally received palliative (pain reducing) treatments, such as analgesics and/or external bracing. These treatments may alleviate pain, but they do not repair the broken bone. Severe pain caused by spinal fractures may require bed rest for up to six months.<sup>2</sup>



### **Vertebral compression fractures (VCFs) / spinal fractures**

- A vertebral compression fracture occurs when a bone in the spine collapses, causing the spine to shorten and often curve forward. Multiple spinal fractures can result in spinal deformity and is seen in elderly patients. Deformity of the upper spine is referred to as kyphosis, more commonly known as a dowager's hump.
- Spinal fractures are the most common osteoporotic fracture; over 700,000 spinal fractures occur every year in the U.S. alone<sup>2</sup>
- Only one-third of the spinal fractures that occur each year are diagnosed; the majority of spinal fractures are overlooked by patients and healthcare professionals alike.<sup>3</sup>
- There are 150,000 hospitalizations per year for the medical management of spinal fractures.<sup>2</sup> Vertebral fracture accounted for over 400,000 total hospital days and generated charges in excess of \$500 million.<sup>5</sup>
- In an examination of 2002 U.S. hospital and nursing home direct expenditures, the economic cost to care for osteoporotic fractures was more than \$18 billion. That is a daily cost of \$49 million. The 2030 projected cost: more than \$60 billion, or \$164 million daily.<sup>1</sup>

### **Long-term consequences of VCFs /spinal fractures**

- Magnitude of the problem:
  - Five-fold increase in risk for future spinal fractures after the first spinal fracture and 75-fold increase in risk after two or more spinal fractures, coupled with low bone mass, have occurred.<sup>9</sup> Multiple spinal fractures can affect the alignment of the spine, shifting the body's center of balance, thus increasing the risk for falls and additional fractures, particularly of the spine and hip.
  - Vertebral fractures have been linked to a 3-fold increase in fractures of the humerus (the long bone of the arm) and a 5-fold increase in fracture of the ribs.<sup>10</sup>
  - A study shows that men and women aged 65 and older who had vertebral fracture had a 5-year risk of femoral/hip fracture of 6.7% and 13.3% respectively.
- Mortality:
  - There is an increased mortality rate in patients with vertebral fracture compared to patients without spinal fractures.<sup>12</sup>
  - Women 65 years or older with one or more spinal fracture had a 23% increased mortality rate compared to women without spinal fractures.<sup>12</sup>
  - In women there is a 9-fold increase in the relative risk of dying following a spinal fracture and a 7-fold increase following a hip fracture compared to women without any fractures.<sup>13</sup>
  - Women with vertebral fractures are two to three times more likely to die of pulmonary complications than those without fractures.<sup>12</sup>
- Deformity:
  - Change in spinal alignment after a spinal fracture has healed - The change in the shape of the vertebral body following fracture alters body's center of gravity. Multiple spinal fractures can affect the alignment of the entire spine. Over time, this alteration in spinal configuration may lead to reduction of motion and strength and well as visible spinal deformity known as kyphosis or dowager's hump.<sup>8</sup>
- Morbidity:
  - Decreased pulmonary function and increased respiratory disorders – Multiple fractured and collapsed vertebrae shorten and curve the spine, moving the ribs down toward the pelvis and contributing to compression of the chest and abdominal cavities. Compression of the chest cavity can create new, or worsen existing, respiratory disorders, including chronic obstructive lung disease and pneumonia.
  - Increased incidence of sleep disorders - Affected patients may experience fitful, non-restorative sleep as a result of back pain or depression.<sup>6</sup>
  - Decreased appetite and potential for malnutrition due to stomach compression.<sup>3</sup>
- Functional Decline:

- Acute and chronic debilitating pain<sup>6,7</sup> - Acute back pain is common among patients suffering from spinal fractures whether caused by osteoporosis or cancer. In addition, the spinal deformity caused by vertebral fractures can affect adjacent muscles and ligaments, contributing to chronic pain. In a 1998 study of 7,223 women aged 65 and older, women who had just one spinal fracture were two times more likely to suffer back pain than equivalently aged women without spinal fractures.<sup>7</sup>
- Significant performance impairments in physical, functional, and psychosocial domains in older women<sup>8</sup> - According to osteoporosis experts, a patient with severe kyphosis is likely to experience profound physical, psychological and social consequences than a patient with less severe kyphosis.<sup>6</sup>
- Loss of quality of life in patients with radiographic spinal fractures is comparable to patients with chronic obstructive pulmonary disease or cardiac disease. Patients with three or more VCFs had loss of quality of life comparable to patients with cancer or stroke.<sup>14</sup>
- Increased dependence on family and friends<sup>11</sup> - Family/support members may find constant care demanding; patients may fear that their decline in physical function makes them a burden to others.<sup>11</sup>
- Psychological Impairments
  - Clinical anxiety and/or depression<sup>3</sup> - Studies have demonstrated that the physical deformity caused by spine fractures, as well as a fear of falling, contributes to patient anxiety and clinical depression, leading to a reduction in normal daily and social activities.<sup>3</sup>
  - Loss of self-esteem and compromised social roles<sup>11</sup> For women, self esteem is based largely on a comparison between the woman and others around her—a comparison in terms of how she looks and what she can do. According to Debra Gold, Ph.D., “As women develop osteoporotic fractures and associated deformities, they no longer view themselves as desirable human beings.”<sup>11</sup>

For more information about osteoporosis and spinal fractures, please visit the National Osteoporosis Foundation web site at [www.nof.org](http://www.nof.org). For more information on Medtronic and spinal fractures, go to [www.kyphon.com](http://www.kyphon.com).

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Sources:

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- <sup>11</sup> Gold, *The Clinical Impact of Vertebral Body Fractures: Quality of Life in Women with Osteoporosis*, Bone, 1996, 18:3:S185-189.

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- <sup>13</sup> Cauley, et al. *Risk of Mortality Following Clinical Fractures*, Osteoporosis Int, 2000;11:556-61.
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