

Spinehealth and Disease

The Aging Spine

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The rapidly growing baby boomer portion of the population poses numerous challenges to the healthcare system. This includes the field of spine care. Degenerative changes involving the spine are present to varying degrees in all elderly individuals. As individuals get older, their bodies go through many age-related changes including the spine. It is a natural process that is influenced by lifestyle and healthcare. The spine is no different than any other area of the body as it ages; it undergoes changes associated with genetic and environmental influences.

The Census Bureau projects that the number of individuals 65 years of age and older will double from approximately 33 million to 65 million in the year 2030, placing a greater demand on the healthcare system and individual physicians. There will be a greater prevalence of cognitive disorders, physical disabling conditions, urinary incontinence, insomnia and back-related problems. Spinal stenosis and osteoporosis of the spine are already costly dilemmas.

The genetic makeup of the tissues of the spine, postural habits, work responsibilities, level of physical activity and body weight all influence the age-related process. Some of the more common age-related degenerative conditions that afflict the spine include osteoporosis, osteoporotic compression fractures, degenerative joint disease (facet arthropathy), spinal stenosis, degenerative disc disease, adult-acquired scoliosis and degenerative spondylolithesis.

As the spine ages, the bones, ligaments and intervertebral discs undergo degenerative changes. The vertebrae lose calcium content.

The intervertebral discs become progressively dehydrated subsequently become thinner and stiffer. Ligaments of the spine become thinner and less resilient to stress placed upon them. Age-related degenerative changes of the spine often first become evident during the third decade.

One of the earliest age-related changes involves the intervertebral discs. On X-ray this process is usually recognized by thinning of the intervertebral disc space, whereas on MRI much more detail is provided and there is typically evidence of a loss of water content in the disc along with diminished volume of the disc. The loss of vertical disc height leads to increased stress placed upon the pair of facet joints that lie behind the intervertebral disc at each spinal level. Age-related degeneration typically progresses to involve other tissues of the spine such as thickening of the joint capsules and loss of some of the supportive qualities of ligaments that support spinal segments.

Degenerative disc changes associated with loss of disc height and flexibility contribute abnormal movement between vertebral

segments. Degenerative changes can result in an increase in vertebral mobility from tears in the supportive ligaments or degeneration can create a loss of mobility. Increased mobility is termed segmental hypermobility or instability and loss of mobility is termed hypomobility or fixation. In the later stages of spinal degeneration, ankylosis or complete bony fusion of adjoining segments may occasionally occur. With advanced degeneration, soft tissues of the spine are at risk for disruption, which can lead to disc herniation, compression fractures and ligamentous discontinuity. When the soft tissues of the spine are unable to maintain spinal stability or bony alignment, vertebral slippage or listhesis can develop.

Spinal degeneration is an inevitable part of the aging process for most individuals. It may be associated with intermittent and/or persistent signs and/or symptoms. For some, it will significantly compromise the quality of their life and diminish their ability to adequately perform activities of daily living. A growing body of evidence shows that maintaining an active lifestyle, improving posture and exercising on a regular basis can be very helpful in reducing the symptom presentation associated with age-related degenerative changes. Spinal tissues remodel and repair in response to stresses placed upon them. Subsequently, efficient posture and regular exercise positively impact the tissue remodeling and conditioning process.

There is an interrelationship between aging, degeneration and deconditioning, however, they are not one and the same. The spine specialist may find the distinguishing features between deconditioning, degeneration, and aging somewhat challenging. The spine specialist may become preoccupied with the disease state and overlook the problems related to aging and deconditioning.

The benefits of exercise for age-related muscle atrophy are well documented. The active individual can slow the aging process and often reduce back pain-related syndromes.

For some elderly people, a severe decline of motor or muscle function results in institutionalization and the loss of independence. There are other disease processes commonly associated with ageing such as osteoporosis, cardiovascular, and osteoarthritis, which further contribute to degeneration of the spine in elderly decline. Because of the rapid growth of the ageing population there will be an increased demand placed on spine specialists for recognizing, preventing, and treating age-related disorders.

Many theories have been proposed for the ageing process, yet no single theory fully explains the underlying mechanisms and the mystery of how and why we age.