

Caring for your Spine

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According to the American Cancer Society, approximately 48 million adults (25.7 million men and 22.3 million women) were actively smoking in the United States in 1997. The adverse effects of smoking include nicotine addiction and a myriad of internal health conditions which include; increased risk of lung and other types of cancer, higher rates of blood vessel disease, heart disease, musculoskeletal disorders and reduced life expectancy.

Cigarettes contain dried tobacco leaves and multiple chemical additives. There are numerous chemicals within cigarettes that potentiate the effects of tobacco. Some of which are substances that can potentially harm the body when they are burned and inhaled.

The tissues of the spine are living and remodeling. The ability for these tissues to efficiently repair and rebuild depends upon a good blood supply, normal immune function and optimum hormonal influences, factors that are adversely affected by smoking. Cigarette smoking reduces the amount of oxygen in the blood and increases the level of harmful substances delivered to the tissues of the spine such as carbon monoxide. Tissues with a poor blood supply are more sensitive to low blood oxygen levels. Tissues of the spine which have a poor or absent blood supply are the cartilage, ligaments and the intervertebral discs. Smoking is known to be a significant risk factor for degenerative disc disease. Cigarette smoking also depletes vitamin C in the body. Vitamin C is essential for collagen production and tissue repair, collagen is a major protein component of all connective tissues.

Cigarette smoking affects hormone function in both men and women. Smoking has been reported to increase estrogen loss in women who are perimenopausal or postmenopausal. This can result in a loss of normal bone density and lead to the development of osteoporosis. Osteoporosis is associated with a loss of bone strength with increased bone fragility. This process typically occurs without obvious signs or symptoms. It is a silent disorder which is responsible for many spine and hip fractures in the United States.

Cigarette smoking increases the risk for complications associated with spine surgery. These risks include post-operative pain, increased inflammation, excessive scar tissue formation (fibrosis), reduced healing time, and impaired bone repair and growth. It also increases the risk for post-operative infection.

There is a growing body of evidence which confirms that cigarette smoking adversely affects the integrity of surgical spinal fusions. In order for a spinal fusion to heal, new bone growth must occur to bridge across adjacent spinal segments to provide stability. Smoking disrupts the normal capacity of bone in the spine to form and grow. Adequate bone growth is required for a spinal fusion to

work. Smoking compromises normal bone metabolism which involves the spine. The negative physiological changes include small artery (arteriolar) constriction, lack of oxygen to bone cells (cellular hypoxia), thinning of bone (demineralization), and delayed growth of new blood vessels (delayed revascularization). Research has shown that smokers who undergo fusion take longer to heal and have a higher incidence of non-union.

Bony fusion is often combined with the use of man made instrumentation to help ensure stability of the spine. Examples of fabricated instrumentation include hooks, rods, wires, screws and plates which are attached to the spine. These types of devices provide immediate stability and hold the spinal segments in place until the bony aspect of the fusion heals and provides biological stability. The long-term success of many types of spinal surgery is dependent upon successful spinal fusion. A failed fusion may lead to the need to undergo another operation. Subsequent operations are often associated with additional risk factors including the development of more scar tissue (fibrosis).

Cigarette smoking interferes with normal immune system function. It subsequently increases and individual's risk for acquiring an infection, of particular importance for the patient who is going to undergo spine surgery. Smoking also increases the likelihood of developing excessive scar tissue, a critical factor when considering spine surgery.

People who are going to have spinal surgery should make every effort to stop smoking. Quitting the habit before surgery will decrease the risk for complications and promote a better surgical outcome. Studies indicate that smoking is most likely to be a risk factor for LBP in people with jobs that require heavy physical exertion.