

## ***Position Statement***

# **The Effects of Tobacco Exposure on the Musculoskeletal System**

*This Position Statement was developed as an educational tool based on the opinion of the authors. It is not a product of a systematic review. Readers are encouraged to consider the information presented and reach their own conclusions.*

An estimated 21 percent of all adults (45.3 million people) smoke cigarettes in the United States.<sup>1</sup> The consequences of smoking results in substantial health care costs and tobacco related deaths each year. The direct medical costs attributable to smoking total about \$75.5 billion a year.<sup>1</sup> In addition, the Centers for Disease Control and Prevention, estimates that tobacco-related diseases result in more than 400,000 deaths, or 1 out of every 5 deaths, among adults in the United States each year.<sup>2,3</sup> Smokers on average, die 14 years earlier than those who do not smoke.<sup>4</sup>

Cigarette smoking not only affects the quantity and quality of the smoker's life, but also the lives of those who are exposed to secondhand smoke. Approximately 60 percent of nonsmokers in the United States have biologic evidence of exposure to secondhand smoke, and studies suggest that even the smallest amount of exposure to secondhand smoke is associated to negative health effects.<sup>5-7</sup> The rates of exposure to secondhand smoke have lead it to be the third leading cause of preventable death in America.

The musculoskeletal system- the bones, muscles, tendons, ligaments and nerves in the body- is significantly affected by tobacco exposure. Tobacco smokers experience a decrease in bone mineral density which increases the risk of osteoporotic fractures.<sup>8-12</sup> Bone density loss is also found in people exposed to secondhand smoke.<sup>13</sup> Furthermore, smokers have impaired bone healing, which can delay the healing of fractures and wounds, and has shown to negatively influence wound healing, bone surgery results and patient satisfaction when compared to nonsmokers.<sup>14-17</sup>

There are many musculoskeletal risk factors associated with tobacco use:

- Smoking is associated with an increase in the incidence of rheumatoid arthritis.<sup>18-20</sup>
- Smokers have a greater chance of developing systemic lupus erythematosus. An inflammatory, multisystemic, autoimmune disease of the connective tissue, characterized by fever, skin lesions, joint pain or arthritis, and anemia, and often affecting the kidneys, spleen, and various other organs.<sup>21</sup>
- Smoking is associated with rotator cuff disease in the shoulder.<sup>22</sup>
- Nicotine, the most powerful substance in tobacco, causes a decrease in blood flow to all tissues in the human body. Proper blood flow is vital for wound healing.<sup>14,16,23</sup>
- Smoking has been shown to be related to poor wound healing and delayed fracture healing.<sup>14,16,23</sup>

- Each year more women will die from hip fractures than by breast cancer. Smoking has been identified as a major risk factor for the development of osteoporosis and osteoporotic related hip fractures.<sup>24,25</sup>
- There is a strong association between decreased bone density and altered reproductive functions in women.<sup>12</sup>
- Studies show that mothers who were exposed to tobacco delivered babies with low birth weight, and decreased bone development.<sup>7</sup>

Quitting smoking before surgery can help improve post-operative wound healing, and decrease recovery time.<sup>15,17,26</sup> Listed below are some resources for smoking cessation:

- American Lung Association-Smoking Cessation Support <http://www.lung.org/stop-smoking/>
- Health and Human Services <http://www.surgeongeneral.gov/priorities/tobacco/index.html>
- Centers for Disease Control and Prevention [http://www.cdc.gov/tobacco/quit\\_smoking/index.htm](http://www.cdc.gov/tobacco/quit_smoking/index.htm)
- American Cancer Society [http://www.cancer.org/docroot/PED/ped\\_10\\_3.asp?sitearea=PED](http://www.cancer.org/docroot/PED/ped_10_3.asp?sitearea=PED)

***The American Academy of Orthopaedic Surgeons (AAOS) is concerned that the American public is not fully aware that the use and exposure to tobacco products has harmful effects on the musculoskeletal system. The AAOS strongly recommends avoiding use and exposure to tobacco products due to the severe and negative impact on the musculoskeletal system.***

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