



## The Smoker's Spine

By Michael N. Brown, DC, MD, DABPMR-PAIN. Reprinted with permission.

Smoking: why does my back not heal?

You may have been asked to read this article it is more than likely because you have been seen in our office for consultation and you are smoker. It is critical that you understand the effects of smoking on your spine and the contributions that smoking has made on your chronic pain may be a critical factor in whether or not we can help you or not.

As of yet, I have never met a smoker that was not at least aware of numerous health hazards and problems associated with smoking. Most smokers at least understand that there is a risk for cancer, etc. It is rare however that I talked to a smoker that has ever heard that smoking affects the spine, and chronic pain. Every smoker seems to understand their addicted to a habit that is slowly deteriorating their body. While I was in training I had a Stanford University professor tell me that it is more difficult to stop smoking that quit the use of heroin. It is rare to come across a smoker that knows smoking has potentially caused part of their back pain problem.

Many years ago spine surgeons began to make important observations with regard to failures of patients to respond to certain surgical procedures.<sup>1</sup> This was especially true with patients undergoing spinal fusion.<sup>1</sup> Patients who smoke were much more likely to have their fusions fail resulting in a failed surgical syndrome. This led to many of these people having to resort to additional surgeries that also generally failed and adding one more person to the spine disabled population. Why was it that smokers seem to have a higher failure and lumbar spine fusions? Spine researchers began to search for answers to this problem. Today, through the dedicated efforts of researchers we have a much more thorough understanding of how smoking affects the spine.

Smoking has several important effects on the spine. The disc has essential no blood supply. The disc gains its nutrition through imbibing fluids and nutrients from small vascular bloods from the end plates of the vertebra as seen in figure to the right.<sup>2</sup> In this picture you can see the disc does not obtain its nutrients for building and maintaining the tissue from blood vessels that do in directly to the disc. One of the important discoveries of the effects of smoking on the spine was that smoking cigarettes causes a specific constriction of the blood flow to these small vascular buds in the vertebral endplates that supply the disc its nutrients. Without important nutrients and minerals to disk cannot replenish itself under stress. Over years, this can lead to breakdown of the disc and a more rapid degeneration.<sup>3</sup> When the spine surgeons were performing fusions they were failing because the new fusion graphs require a good blood supply for the fusion to take. No wonder the patients undergoing spinal fusions were failing and having more complications after spinal surgery. The smokers were cutting off their blood supply to diffusion site and disk.

Oh, there is one more thing! The disc is comprised of complex proteins and molecules. These complex proteins and molecules cannot be put together in such an incredible way without the use of special helpers called enzymes. Enzymes help drive the chemical reactions that put these complex proteins and molecules together faster than a normally would be able to be put together on their own. If it wasn't for enzymes driving the chemical reactions of our body faster we would not be the complex organisms that we are and would probably be a slug! These important enzymes require a very specific pH ( acid / base balance ) in order to operate. If the pH is too high or too low the enzymes simply stop functioning.

Guess what? If you smoke one pack of cigarettes in one day, you have lowered the pH of your disk to a point where the enzymes no longer function. For that day your disk cannot put any of the proteins together to help replenish any damage that you may have caused by physical activity. Smoking for one day also constricts the tiny blood vessels in the endplates of the vertebra and feed the disc.<sup>3,4</sup>

Because the disk is such a “metabolic slug” with slow chemical reactions one day of smoking does not cause any significant harm. Smokers do not smoke just one day. They smoke every day and do so for years. It is more common that smokers will use at least one pack of cigarettes per day. If you smoke two or three packs of cigarettes per day the problem becomes much worse. If you have smoked one pack of cigarettes per day for a period of ten years you have eliminated any ability of your disk to put together the proteins that repair and strengthen your disk from the breakdown caused by physical activity. You have “choked off” the circulation to the disc for a decade. The annular fibers of the disk began to crack, weaken and breakdown.<sup>5</sup> This causes tearing and fissures in the annulus as seen in figure to the right. To understand more thoroughly the serious problems associated with these tears and fissures please read our article on disc pain and the annular tear.

It is thought by some researchers and spine specialists that the disk becomes biochemically sick during such degeneration breakdown. The elevation of specific chemicals within the disk sets the stage for chronic pain. These chemicals can leak out into the spinal canal through the fissures and tears in the disk. Spilling these chemicals around the spinal nerves and spinal canal is like unto pouring gasoline on a fire. These chemicals sensitize the nerve and soft tissues to pain. They can cause nerve swelling, inflammation and congestion.

As the disk begins to breakdown you become more predisposed to disc herniations, internal disruptions, annular fissures and the myriad of associated problems that set you up for chronic pain the rest of your life. It is truly possible to smoke your way into chronic pain and to cause enough disk pathology that it is impossible to fix despite our technology and advancements that we have made. If you're a chronic back pain sufferer and are seeking multiple medical opinions and requesting help from these health-care providers, I ask you one question. Where is your responsibility in all of this?

What are you willing to do to help yourself? You are an important partner in the team that is required to help you recover. Are you a team player or are you going to continue to ask everyone to put out

their best effort to help you without you trying to help yourself? One of the common questions that I am asked after revealing the perils of smoking and its effect on the spine, is whether or not the changes that have been created by smoking are reversible.

Unfortunately, many of the changes and that follow after smoking are irreversible. Any potential for healing that you have left is going to depend on whether or not you are willing to make a change. Are you over medicated and under willing, or are you willing to take charge and make the necessary changes.

## REFERENCES

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