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CORR Insights®: Smoking is Associated with Increased Blood Loss and Transfusion Use After Lumbar Spinal Surgery

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Where Are We Now?

I recently performed a web search to get a sense of the scope of this topic; the search string “smoking and surgical complications” in Google [Mountain View, CA, USA] returned more than 8,100,000 sites, of which 157,000 were considered scholarly. The direct cost of chronic cigarette smoking is estimated to cost our healthcare system more than USD 170 billion dollars per year and represents the leading cause of preventable deaths [4]. Chronic cigarette smoking has

been associated with a wide range of systemic disorders [1], especially (although by no means exclusively) of the pulmonary and cardiovascular systems; smoking increases the risks of peripheral vascular occlusive disease, atherosclerotic cardiovascular disease, ischemic stroke, myocardial infarction, and lung cancers [2]. Musculoskeletal effects of smoking include impaired wound and bone healing, inhibition of spinal fusion, and surgical-site infection [3]. As the current study notes, intraoperative estimated blood loss and subsequent transfusion may be an

unrecognized additional problem caused by smoking cigarettes. Unquestionably, chronic cigarette smoking is a patient factor that is controllable, preventable, and depending on the longevity of the chronic cigarette smoking, partially reversible.

Where Do We Need to Go?

McCuniff and colleagues should be congratulated on bringing this issue to light. Surprisingly little has been published on this topic; to my knowledge, only one other study has evaluated the influence of smoking on blood loss and blood transfusions in patients undergoing spine surgery, and with only 112 patients, it may have been underpowered to detect differences. In fact, the study did not detect any significant differences [5]. Clearly, more work needs to be done on this important topic. Any retrospective study suffers from some degree of selection bias among other inherent and uncontrollable biases. Future studies might evaluate the findings of McCuniff and colleagues by broadening the

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populations evaluated to include more homogeneous treatment cohorts such as degenerative spondylolisthesis laminectomy and instrumented fusion, cervical laminectomy and instrumented fusion, or degenerative scoliosis decompression and instrumented fusions not covered in the current study by McCunniff and colleagues. Additionally, it would be interesting to see whether some contemporary approaches to minimizing blood loss during surgery—tranexamic acid and larger bipolar sealers, or collagen matrices and thrombin, for example—could mitigate the blood loss during spinal surgery in patients who smoke.

How Do We Get There?

We need to remember that statistical significance and association do not prove cause and effect. There is no clear scientific understanding at this point as to why chronic cigarette smoking may increase bleeding—although it may affect clotting at the platelet level. In

fact, more commonly, chronic cigarette smoking causes occlusive vascular problems. Clearly, further basic science study will be required to provide greater confidence in these observed associations, potential mechanics of action, and apparent dichotomies. That said, smoking certainly does not confer any benefits on patients, especially when it comes to surgery. It does seem that this is an area that is deserving of further prospective controlled investigation. Future questions such as: “Is this association reproducible in other studies in a variety of orthopaedic or other non-orthopaedic surgical techniques?” or “Is this effect of smoking reversible with cessation of a certain time period?” are worthy of investigation. However, this paper supports the notion that chronic cigarette smoking is associated with more blood loss and an increased likelihood of transfusion in patients undergoing lumbar spinal surgery, and so represents yet-another reason to counsel patients to stop smoking in preparation for that surgery.

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