Editorial

# The opioid crisis as it pertains to spine surgery

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We read a recent study from Rezaii *et al.* with great interest: "*Lumbar spine surgery reduces postoperative opioid use in the veteran population*" (1). We commend the authors on their work within the veteran population who concluded that veterans, despite being a high-risk population with a higher burden of mental health comorbidities, have a postoperative opioid dependence that mirrors the general population following lumbar spine surgery. In addition, results demonstrated that preoperative opioid exposure increased the likelihood of opioid use one year after surgery.

Furthermore, their results stressed the importance of proper preoperative opioid counseling and weaning strategies postoperatively. A study conducted at our institution examined opioid use after elective spine surgery in the general population (2). Our results echo Rezaii *et al.* with regards to the impact of preoperative opioid exposure on the degree of opioid use postoperatively. Additionally, our results demonstrated that the modern elective spine surgery patient's opioid utilization after surgery is less than routinely prescribed. Thus, our intent in this editorial is to briefly review the history of the opioid epidemic, its relation to orthopaedic surgery, and to provide remarks on mitigating strategies with regards to spine surgery.

## The opioid epidemic history & background

In 2017, the U.S. Department of Health and Human Services (HHS) declared a public health emergency to address the national opioid crisis after more than 40,000 deaths were attributed to opioid overdoses, which alarmingly exceeded all preceding years. In 2019, over 70,000 people died from all drug overdoses; 14,000 of those deaths involved prescription opioids, averaging 38 people dying each day from overdoses involving prescription opioids. More recent statistics show that in 2020: 10.1 million people misused prescription opioids and there were 1.6 million sufferers of opioid use disorder in the United States alone. The total economic burden of prescription opioid misuse in the United States is an estimated $78.5 billion per year according to the Center for Disease Control and Prevention (3-6).

The opioid epidemic dates back to the 1990's when physicians began increasing their opioid prescribing practices. This change in practice has been attributed in part by pharmaceutical companies misleading prescribers that the risk of addiction to some opioid pain relievers was extremely small (7). When it became clear that these medications were highly addictive, the damage was already done, as many of the large quantity of opioids prescribed became misused, abused, or diverted. At the same time, the American Pain Society declared pain as the "fifth vital sign" supporting the evaluation and treatment of pain, which was deemed as essential as monitoring temperature, blood pressure, respiratory rate, and heart rate (8,9). In 2001 this

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idea was supported by the Joint Commission as part of their Pain Management Standards, where pain control was put under the microscope.

## The opioid epidemic continues

Opioid prescriptions given to control pain after surgery are often the first time a patient is exposed to opioids and is a well-documented risk of chronic opioid dependence in the opioid naïve. However, the majority (70%) of prescription opioid users receive them through diversion, often from legitimate prescriptions of friends and family (8). Many surgeons prescribe opioids to control postoperative pain, with orthopedic surgeons rated as the third highest prescribers of opioids (10-12). Miscalculating the magnitude of postoperative pain can lead to over-prescribing opioids after surgery, thereby inadvertently contributing to the quantity of unused pills available for diversion (2).

Spine surgeons are faced with four unique challenges in managing their patients' pain. First, spine surgery is associated with substantial postoperative opioid requirements and consumption, demonstrated in several recent studies evaluating opioid use after a variety of elective orthopedic and non-orthopedic surgeries (8,10,13,14). Second, according to data extracted from the Global Burden of Disease, Injuries, and Risk Factors Study between 1990–2017, low back pain was the leading cause of disability globally and continues to remain among the top 5 causes of disability worldwide (15,16). Third, many patients are prescribed opioids prior to seeking treatment from a spine surgeon, therefore they are no longer opioid naïve and have greater risk of opioid misuse, abuse, and developing opioid dependence. Finally, the aging population with a longer life expectancy coupled with more minimally invasive spine surgery options has led to a greater number of spine surgeries being performed each year, estimated at nearly 1 million cases in the United States annually (17).

## Combating the opioid epidemic today

Despite these hurdles, spine surgery continues to evolve in significant and positive ways. The advent of minimally invasive spine surgery has brought robotic-guided, navigation-guided, augmented reality-assisted, and endoscopic spine surgery options which have been shown to reduce tissue disruption and operative times, giving the potential for a reduction of hospital length of stay and a faster recovery overall (18-20).

In addition to these innovative surgical techniques, implementation of enhanced surgical recovery (ESR) protocols has modernized the way spine surgery patients prepare for, undergo, and recover from surgery (21,22). Combining preoperative education on pain management and weaning after surgery, optimizing intraoperative non-opioid pain-relieving tactics, and a multi-modal approach to pain management postoperatively, adequate pain control can be achieved while opioid use is minimized after surgery.

Furthermore, we are able to better predict opioid utilization patterns by identifying certain patient characteristics, such as (I) preoperative opioid exposure, (II) surgery type, (III) age, (IV) BMI, (V) depression/anxiety diagnoses, (VI) length of hospital stay, and (VII) pain scores at hospital discharge. With this information, tailoring prescribing practices to the individual's needs is possible.

It is important to recognize that contributors to the opioid crisis are multifactorial, with social and economic determinants of health playing a major role in its trajectory (23). We acknowledge that supply and overdoses attributed to illicit fentanyl and heroin may be the lead driving force in today's version of the crisis, yet it is important to focus on all facets of the crisis, however small they may be.

## Conclusions

The Opioid Epidemic presents a serious challenge to orthopaedics and the US healthcare system overall. Adjustments in prescribing practices and patient education are paramount in combating this facet of the epidemic. The advent of innovative technologies, minimally invasive surgical techniques, and ESR protocols present promising opportunities in addressing this crisis as it relates to spine surgery. Additional high-quality studies continue to be necessary to provide further information on this timely topic.

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