

Perioperative Pain Management – Peripheral Nerve Blocks as the Central Component of a Multimodal Approach to Allow for Effective Pain Management and Cost Savings

Traditionally, pain has been considered a rather typical “symptom” of surgical care and treatment concepts were often mono-modal in nature, usually using opioids as the single tool to achieve the goal. In addition, therapy was usually initiated after the insult and was often associated with significant delays and lack of continuity, resulting frequently in “analgesic gaps”. Consequently, several studies and investigations reported on the under-management of perioperative pain as recent as 2003, both in the ambulatory and in-house surgical setting, and questioned the efforts of healthcare providers regarding their patient’s pain experience. This very problematic situation finally triggered the declaration of pain to be the fifth vital sign by hospital accreditation organizations, demanding change and improvement.

The case can be made that some of the most significant advances in this field that have occurred over the last 10 years were based on the widespread recognition of the benefits of regional anesthesia and especially peripheral nerve blocks as an ideal tool for perioperative pain management and the introduction of a multimodal concept of perioperative pain therapy frequently utilizing continuous peripheral nerve blocks as the centerpiece. The term “perioperative “ refers to the fact that ideally pain management is implemented preemptively, meaning prior to the surgical insult. There is a strong school of belief that such a preemptive approach may have the potential to avoid the development of excessive postoperative pain by inhibiting biochemical processes such as

“wind-up” phenomena. A multimodal approach to pain therapy is based on the concept that perioperative pain is usually transmitted via multiple different pathways and mediators targeting a variety of pain receptors. Consequently, the multimodal approach utilizes agents from different drug classes and work mechanism in combination in an attempt to block different pain pathways and/or prohibit mediators from reaching their specific receptors. Such a multimodal approach utilizing several agents in combination with peripheral nerve blocks as the key ingredient has consistently been shown to result in significantly better patient outcomes such as pain control, avoidance of unwanted side effects and patient satisfaction.

Moreover a multimodal strategy for perioperative pain management has the potential to result in significant cost savings for a healthcare organization as well as for the entire healthcare system. While only very few investigations analyze the cost efficacy of an evidence based multimodal approach to pain management, a study in 2009 by Brooks et al. evaluated a “translating research into practice” behavioral intervention, designed to increase the use of evidence-based acute pain management practices for patients hospitalized with hip fractures. The authors investigated 12 acute care hospitals that at least treated 30 in-patients older than 65 years per year for hip fractures. The hospitals were randomized to an intervention or a comparison group. Hospitals in the intervention group were provided with evidence-based practice guideline on Acute Pain Management in the Elderly. While the initial cost to implement such an evidence based multimodal acute pain management concept totaled \$ 17,714 per hospital, this investment resulted in cost savings of more than \$1500 per inpatient stay. This reduction in costs was mainly achieved by a shortened hospital length of stay, less utilization of radiation, laboratory,

pharmacy, pulmonary and respiratory services as well as savings related to fewer blood transfusions and other material supplies. The findings by Brooks et al. are supported by multiple other studies reporting that effective perioperative pain management in deed shortens hospital length of stay and reduces the incidence of adverse events such as respiratory complications. Especially in an elderly population, such as studied by Brooke et al., early mobilization and ambulation is crucial to avoid adverse events associated with being bed-bound and immobile. Effective multimodal pain management plays a key role to allow for such early mobilization since adequate pain control is frequently a prerequisite for patients to actively participate in their rehabilitation process.

Another important economic benefit associated specifically with the preemptive application of a multimodal perioperative pain management concept is the prevention of chronic pain development. Billions of dollars are spend every year in the United States due to costs accrued by a significant portion of the population who suffers from debilitating chronic pain. There are now encouraging data available demonstrating that a preemptively initiated multimodal pain treatment approach with peripheral nerve blocks as the main modality can inhibit the progression from acute perioperative pain to chronic pain.

In summary, while cost saving calculations may vary from institution to institution depending on local circumstances, setups, types of surgery performed, and types of patients, the literature provides compelling evidence that a multimodal approach to perioperative pain management utilizing peripheral nerve block techniques as the major component has the potential for tremendous cost savings. At the same time, patients benefit significantly due to improved outcomes.