



## Pain and Neuromodulation

Seyed Mansoor Rayegani<sup>1,\*</sup>

<sup>1</sup>Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

\*Corresponding author: Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: rayegani@gmail.com

Received 2021 August 18; Accepted 2021 August 18.

**Keywords:** Pain, Neuromodulation, Pain Management

### Dear Editor,

Pain is the most common and well-known complaint of patients. History and literature of medicine is full of various diagnostic and therapeutic methods for pain management, and physicians' competencies had been measured by their success in reducing pain. Throughout the written history of mankind, the description of complaints about pain and how to treat them has always had a special place. Even poets and philosophers used pain and its effects in expressing their romantic and mystical descriptions. With the advent of modern medicine and increased understanding of human anatomy and physiology, the view of scientists regarding pain has changed. The topics of neurophysiology, neuroanatomy, and pharmacology, along with biochemistry and radiology, have played an absolutely valuable role in the recognition and treatment of pain in recent decades. Physical measures, such as heat, cold, pressure, and massage, as well as plant and animal components, have been used for pain management. The advent of chemical drugs following physiology, biochemistry, and pharmacology was a major revolution in overcoming chronic pain. The growth and branching of medical specialties and the orientation of these trends have provided a background for the emergence of specific disciplines related to pain. Specialized disciplines such as anesthesia, physical medicine and rehabilitation, neurosurgery, neurology, and psychiatry have begun supplementary and sub-specialty pain courses since the late seventies and early eighties. Among the effective and growing measures in the treatment of pain are interventional methods and the use of neuromodulation and surgical procedures. According to the International Neuromodulation Society, therapeutic neuromodulation is "the alteration of nerve activity through targeted delivery of a stimulus, such as electrical stimulation or chemical agents, to specific neurological sites in the body". Researchers Shealy and Mortimer were the first to implant an electrode and successfully treat the intractable pain by stimulation of nerves in the spinal

cord. Their work opened up a new area of modern applications of neuromodulation in pain relief and treatment (1). Similar to pacemaker for the heart that deliver electrical shock to restore a normal heart rhythm, neuromodulation therapies help to improve normal function of the nervous system. Spinal cord stimulation (SCS) is one of the most-established examples of neuromodulation treatments. Intrathecal pump, which release drugs directly into the spinal fluid surrounding the spinal cord, is another state-of-the-art implantable device for neuromodulation. This approach allows for dramatically lower doses of medications as the drug does not become metabolized by body prior to reaching the target area (1). Interventional pain management means any therapeutic application to deliver drugs and/or medical devices to target organs. Interventional measures are required during additional training courses after passing the specialization courses in the fields of anesthesia, physical medicine and rehabilitation, neurosurgery, neurology, and radiology. Several neuromodulation methods can be used with interventional measures.

Timely and appropriate application of interventional and neuromodulation measures can reduce disability and pain, especially in cases where pain is resistant to conventional methods. The combination of conservative measures, physical medicine, rehabilitation, drugs, and interventional and neuromodulation methods, along with cognitive therapy has the highest effect on reducing pain and its complications. Emphasizing the rational use and scientific application of interventional and neuromodulation methods, this journal announces its readiness to publish scientific articles in the field of pain with an emphasis on interventional and neuromodulation measures.

### Footnotes

**Authors' Contribution:** SMR drafted the manuscript, revised the manuscript, and approved the final version for publication.

**Conflict of Interests:** The author declares that there are no conflicts of interest.

**Funding/Support:** The author received no financial support for the research, authorship, and/or publication of this article.

## References

1. Shealy CN, Mortimer JT, Reswick JB. Electrical inhibition of pain by stimulation of the dorsal columns: Preliminary clinical report. *Anesth Analg.* 1967;**46**(4):489-91. [PubMed: [4952225](#)].