# Spinal Cord Injury Pain

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**KEYWORDS**

• Spinal cord injury • Musculoskeletal pain • Neuropathic pain • Spasticity

**KEY POINTS**

- Spinal cord injury (SCI)-associated pain has a specific classification approach that assists in guiding treatment strategies.
- SCI-related pain seems to be prevalent, but there is considerable variability in the epidemiology of this condition.
- Evaluation of SCI-associated pain relies heavily on history and is supplemented by a neuromusculoskeletal examination and judicious use of laboratory and radiologic testing.
- Relatively few treatments for SCI-associated pain have been extensively studied.

## INTRODUCTION

Although traumatic SCI results in a number of serious impairments including paralysis, sensory loss, and neurogenic bowel/bladder function, perhaps no SCI-associated condition is more vexing to the treating physiatrist than chronic pain. Some of these SCI-related impairments can be accommodated with compensatory strategies, whereas chronic pain, especially neuropathic pain associated with injury to the spinal cord, remains quite recalcitrant. In addition to the expected challenges in treating any chronic pain condition, treatment of SCI-related pain has the difficulty of disruption of normal neural pathways that subserve pain transmission and attenuation. This article attempts to describe the classification, epidemiology, evaluation methods, and treatment strategies for this serious pain syndrome.

## CLASSIFICATION

Before 2000, there was no consistent approach to the classification of SCI-related chronic pain. This variability was described by Hicken and colleagues[1] during a review in 2002 in which 29 distinct schemes were described with potentially confusing and inconsistent terminology. By 2008, 3 classifications systems emerged as the leading systems based on their utility, comprehensiveness, validity, and reliability. These schemes included the Cardenas classification,[2] the taxonomy of the International

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Association for the Study of Pain,[3] and the Bryce-Ragnarsson classification.[4] Through the leadership of Bryce, a unified system was created and published in 2011. The International Spinal Cord Injury Pain Classification (ISCIP) has been adopted by many leading SCI and pain professional associations throughout the world.[5] This classification is visually depicted in **Fig. 1**.

Given the probable ubiquity of the ISCIP classification, some commentary on this approach is warranted. The first tier of this system is divided into nociceptive, neuropathic, other, and unknown categories. The distinction between the nociceptive and neuropathic categories is certainly approximate because the treatment approaches to these syndromes are often vastly different. As discussed later in this article, nociceptive pain can often be addressed by classic physiatric techniques (in the case of musculoskeletal pain) or other medical interventions (in visceral and other nociceptive pain). This fact is in contradistinction to neuropathic pain in which many treatment approaches are either pharmacologic or interventional. The ISCIP classification also demonstrates the continued difficulties of even expert clinicians and scientists to categorize every single pain condition associated with the SCI population, as demonstrated by the other and unknown categorizations. The reliability of the ISCIP

| Tier 1: pain type | Tier 2: pain subtype | Tier 3: primary pain source and/or pathology (write or type in) |
|---|---|---|
| ☐ Nociceptive pain | ☐ Musculoskeletal pain | ☐ _____<br>e.g., glenohumeral arthritis, lateral epicondylitis, comminuted femur fracture, quadratus lumborum muscle spasm |
| | ☐ Visceral pain | ☐ _____<br>e.g., myocardial infarction, abdominal pain due to bowel impaction, cholecystitis |
| | ☐ Other nociceptive pain | ☐ _____<br>e.g., autonomic dysreflexia headache, migraine headache, surgical skin incision |
| ☐ Neuropathic pain | ☐ At-level SCI pain | ☐ _____<br>e.g., spinal cord compression, nerve root compression, cauda equina compression |
| | ☐ Below-level SCI pain | ☐ _____<br>e.g., spinal cord ischemia, spinal cord compression |
| | ☐ Other neuropathic pain | ☐ _____<br>e.g., carpal tunnel syndrome, trigeminal neuralgia, diabetic polyneuropathy |
| ☐ Other pain | | ☐ _____<br>e.g., fibromyalgia, complex regional pain syndrome type I, interstitial cystitis, irritable bowel syndrome |
| ☐ Unknown pain | | ☐ _____ |

**Fig. 1.** The International Spinal Cord Injury Pain Classification (ISCIP). (*From* Bryce TN, Biering-Sorensen F, Finnerup NB, et al. International spinal cord injury pain classification: part I. Background and description. March 6–7, 2009. Spinal Cord 2012;50(6):415; with permission.)