

## A Comprehensive Review of Central Post-Stroke Pain

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### ■ ABSTRACT:

Although central post-stroke pain is widely recognized as a severe chronic neuropathic pain condition, its consolidated definition, clinical characteristics, and diagnostic criteria have not been defined due to its clinically diverse features. The present study was undertaken to comprehensively review current literature and provide a more complete picture of central post-stroke pain with respect to its definition, prevalence, pathophysiology, clinical characteristics, and diagnostic problems, and to describe the range of therapies currently available. In particular, nursing care perspectives are addressed. It is hoped that this review will help nurses become knowledgeable about central post-stroke pain and provide valuable information for the drafting of effective nursing care plans that improve outcomes and quality of life for patients with central post-stroke pain.

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### BACKGROUND

Pain is a serious problem after stroke, and two major types of pain must be differentiated in patients with post-stroke pain: central post-stroke pain (CPSP) and pain primarily triggered by peripheral mechanisms (such as shoulder pain, painful spasticity, persistent headache, and musculoskeletal pain) (Klit, Finnerup, & Jensen, 2009; Seifert, Mallar Chakravarty, & Sprenger, 2013). CPSP was originally referred to as Dejerine-Roussy syndrome after the French neurologists who first described an unusual pain syndrome following thalamic stroke (Dejerine and Roussy, 1906).

Although CPSP is widely recognized as a severe chronic neuropathic pain condition, no consolidated definition or clinical characteristics have been agreed upon due to its clinically diverse features. In addition, the prevalence of CPSP has not been precisely determined, partly because of difficulties associated with distinguishing this syndrome from other pain types that can occur after stroke (Klit et al., 2009). Furthermore, the detailed mechanism responsible for CPSP has not been elucidated and no standard treatments have been established (Tamiya, Yoshida, Harada, Nakamoto, & Tokuyama, 2013). CPSP is known to be resistant to conventional analgesics (Nandi et al., 2002; Pickering, Thornton, Love-Jones, Steeds, & Patel, 2009), and although a wide variety of treatment options have been suggested, no universally applicable rules have been presented for treatment selection.

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It has been proposed that CPSP reduces quality of life; undermines rehabilitation efforts; and leads to depression, anxiety, sleep disturbance, drug dependence, and poor social interactions (Hansson, 2004; Kumar & Soni, 2009). Because CPSP has been confused with a number of other conditions, and because treatment strategies for CPSP and pain from other causes differ (Kim, 2009; Kumar & Soni, 2009), an understanding of the clinical features of CPSP is important for its proper diagnosis and successful management. Furthermore, as the aging population continues to increase, CPSP is set to become a more important issue in pain management nursing.

## PURPOSE

The present study was conducted to provide a more comprehensive picture of CPSP based on an up-to-date review of CPSP with respect to definition, prevalence, pathophysiology, and clinical characteristics. Diagnostic problems and the range of therapies currently available are also discussed and nursing care perspectives are addressed.

## METHODS

### Search Methods

Although the present study was not intended as a systematic review, literature searching was systematically conducted to identify all available evidence. The primary patient population of interest was stroke patients with central neuropathic pain; both hemorrhagic and ischemic stroke patients were included. The main outcomes (targets of the literature search) were issues regarding the definition, prevalence, pathophysiology, clinical characteristics, diagnosis, and management of CPSP. In terms of the study designs chosen for review, all study designs—traditional and systematic reviews and randomized controlled, nonrandomized controlled, observational comparative, and case studies—were included to avoid information loss.

The information sources used primarily were the PubMed, CINAHL, MEDLINE, and SCOP databases, which were searched using the key terms “central post-stroke pain,” “central neuropathic pain,” “central pain after stroke,” and “neuropathic pain after stroke.” The search terms were decided upon after several rounds of trials and by continuous discussion between authors until consensus was reached. The search encompassed entire databases and yielded 399 studies (published from 1989 to June 2013). Inspections of these studies resulted in the identification of 212 duplicates. Thus, 187 studies were primarily identified and their abstracts were closely reviewed. However, 76 of

the 187 were excluded because they were animal studies ( $n = 5$ ), not written in English ( $n = 13$ ), or early studies ( $n = 58$ ) in which CPSP was not differentiated from other types of neuropathic pain. Further searching was performed by tracking down all related studies cited in the bibliographies of the primarily searched studies, and this resulted in the inclusion of another 21 studies. In the end, 132 studies were included in the present study. A schematic of study selection process is provided in Figure 1.

### Data Extraction

For preliminary data collection, 10 studies were randomly selected to devise a data sheet. The devised data sheet included the following information: author; year of publication; study design; subjects; and the definition, prevalence, temporal pattern, clinical characteristics (pain nature, intensity, and location), pathophysiology, and CPSP management. All data were primarily extracted by the first author, and confirmed by the corresponding author. Cross-checking between the authors was conducted and disagreements were resolved by consensus. Because of the heterogeneous nature of the information gathered, methodological quality was not assessed.

## RESULTS

### Definition of CPSP

Pain has been categorized in a variety of different ways, but is widely classified as nociceptive or neuropathic (Nicholson, 2006). Nociceptive pain refers to pain caused by damage to muscles, bones, skin, or internal organs, and is the type of pain most consider when pain is mentioned. On the other hand, neuropathic pain is defined by the International Association for the Study of Pain (IASP, 1994) as “pain initiated or caused by a primary lesion or dysfunction in the

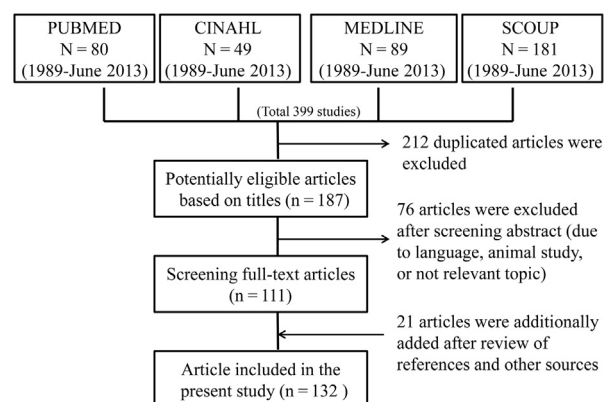


FIGURE 1. ■ A schematic of the study selection process.

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