

Continuous Infusion of Peripheral Nerve Block for Chronic Pain

Clinical Policy ID: CCP.1347

Recent review date: 4/2026

Next review date: 8/2027

Policy contains: Cancer pain; chronic pain; continuous peripheral nerve block; perineural infusion.

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Coverage policy

Continuous infusion of a peripheral nerve block is clinically proven and, therefore, may be medically necessary for prolonged (days or weeks) treatment of chronic cancer pain for any of the following indications (National Comprehensive Cancer Network, 2026):

- Pain that is likely to be relieved by a regional block (such as chest wall pain with an intercostal nerve block, or other common examples like pancreatic pain with a celiac plexus block).
- There is a desire to reduce reliance on systemic opioids due to inadequate pain relief or intolerable side effects.
- Regional chronic pain syndromes are present in members with cancer.

Limitations

Continuous infusion of a peripheral nerve block may not be suitable in members with ongoing infection or blood clotting disorders (National Comprehensive Cancer Network, 2026).

All other uses of a continuous infusion of a peripheral nerve block are investigational/not clinically proven and, therefore, not medically necessary.

Alternative covered services

Standards of care involve a range of multimodal approaches depending on pain severity and underlying condition, including, but not limited to:

- Non-pharmacologic interventions (e.g., acupuncture, physical therapy and exercise, cognitive behavioral therapy, and mindfulness meditation).
- Systemic opioid and non-opioid pharmacotherapy.
- Local anesthetic injections.
- Epidural or intrathecal regional infusions.
- Neuro-ablation.
- Peripheral nerve stimulation.
- Surgical intervention.

Background

Chronic pain is defined as either ongoing pain persisting three to six months longer than the usual recovery period or a result of a pain-inducing medical condition (complex regional pain syndrome, arthritis, cancer, phantom limb pain) that can be continuous or intermittent in nature. It is a significant and challenging health problem to manage, particularly in those of African American descent and Hispanic ethnicity, with lower socioeconomic income and education, with cognitive impairment, and in pediatric populations (Rikard, 2023). It is among the most common reasons to seek medical treatment and is associated with a decreased quality of life, opioid dependency, and declining mental health leading to chronic depression (Zelaya, 2020).

Treatment goals are to decrease pain intensity and improve functional outcomes. Prescription opioids are effective, but their long-term use is associated with an increased risk of opioid dependency, overdose, and other adverse outcomes (e.g., cardiovascular events or fractures). In consideration of this, treatment of chronic pain poses a significant public health challenge that has resulted in multidisciplinary and multimodal non-opioid approaches to reduce opioid misuse and abuse and manage pain more effectively (National Academies of Sciences, Engineering, and Medicine, 2017).

A peripheral nerve block is neuromodulatory therapy delivered as a single injection or by continuous infusion. Peripheral nerve blocks are versatile and can be tailored to the specific anatomical region. Single-injection peripheral nerve block offers effective pain relief for up to 24 hours but requires a dense motor block, and important sensory loss must be taken into account (Chang, 2025). Continuous infusion of a peripheral nerve block comprises an indwelling catheter, a long-acting local anesthetic, and an infusion pump. The catheter is inserted percutaneously in the proximity of the target nerve to deliver local anesthetic, most commonly bupivacaine and ropivacaine (Ilfeld, 2017).

Multiple small portable infusion pumps are available, each with benefits and limitations. They are most often used for post-surgical pain control in the hospital setting, but lightweight, portable pumps allow for ambulatory infusion as well. A continuous peripheral nerve block offers adjustments of volume or concentration of local anesthetic, which reduces the need for a large initial bolus. It also lowers the risk of systemic toxicity, falls, positioning injury, and potentially improves patient outcomes.

Findings

Guidelines

Evidence-based guidelines provide little direction on the optimal use of continuous infusion of a peripheral nerve block in chronic nonmalignant pain care. Where peripheral nerve block is mentioned as a treatment option,

guidelines recommend single-injection peripheral nerve block as an alternative when more conservative treatment has failed, with no specific mention of continuous delivery systems, except when recommending neuraxial techniques (Kopp, 2025; Manchikanti, 2013; Martelletti, 2013; Neal, 2015).

The American Academy of Pain Medicine's guideline on complex regional pain syndrome states that brachial plexus blockade has been used successfully in numerous case reports. Catheters have been kept in place in the same position for as long as three weeks (Harden, 2022).

For malignant pain, the American Society of Clinical Oncology (Paice, 2016) recommends peripheral nerve blocks as an interventional therapy option based on a Cochrane review (Arcidiacono, 2011) demonstrating improved pain and lower opioid consumption at four weeks in adults receiving a single-injection celiac plexus block for pancreatic cancer pain. Neither the review nor the guideline specifically mentioned continuous infusion except with neuraxial techniques.

The National Comprehensive Cancer Network Guidelines for Adult Cancer Pain (2026) states that percutaneous catheters with external infusion pumps may be used for prolonged (days or weeks) continuous drug delivery of selected peripheral nerve and regional plexus blocks. Interventional methods may not be suitable in situations of ongoing infection or blood clotting disorders, based on typical medical practice. Reasons for considering interventional options include:

- Pain is likely to be relieved by a regional block (such as chest wall pain with an intercostal nerve block, or other common examples like pancreatic pain with a celiac plexus block).
- There is a desire to reduce reliance on systemic opioids due to inadequate pain relief or intolerable side effects.
- Regional chronic pain syndromes are present in patients with cancer.

Evidence review

The evidence of continuous peripheral nerve block for chronic pain indications is anecdotal, consisting of case reports and small case series describing continuous peripheral nerve block in adult and pediatric populations for complex regional pain syndrome, intractable phantom limb pain, terminal cancer pain, trigeminal neuralgia, postsurgical chronic (greater than three months) pain syndromes, ischemia-induced pain, and ulcer-derived pain (Ilfeld, 2017). The evidence suggests continuous peripheral nerve block is feasible and may offer effective analgesia for certain chronic pain types that would respond to a peripheral nerve block, but the relative safety or efficacy compared to other treatment options, optimal delivery, or patient selection criteria cannot be determined.

Ilfeld (2021) reported the results of a blinded, multisite trial of participants with phantom limb pain randomized to receive a six-day ambulatory perineural local anesthetic infusion with ropivacaine ($n = 71$) or normal saline placebo ($n = 73$). The primary outcome was mean phantom pain severity measured with a Numeric Rating Scale (0 to 10) at four weeks, followed by an optional crossover treatment for up to an additional 12 weeks. Baseline pretreatment pain severity scores were similar in both groups. Compared to the placebo group, those receiving the local anesthetic infusion had substantially reduced phantom limb pain four weeks after the initiation of treatment (mean phantom pain intensity $\pm$ standard deviation 3.0 ± 2.9 versus 4.5 ± 2.6 , $P = .003$). The main study limitation was that self-selection of optimal crossover treatment introduced significant selection bias for data collected subsequent to the primary and secondary endpoints. The authors recommended additional research to investigate the optimal perineural infusion parameters and define the precise duration of analgesic benefits.

Ilfeld (2023) reanalyzed outcome data from the Ilfeld (2021) clinical trial to provide more clinically meaningful patient-centered outcomes. A clinically relevant difference was defined as an improvement > 1.5 points on a validated 11-point numeric rating scale based on individual data collected at baseline and four weeks post-

baseline. Among participants who were given a six-day ropivacaine infusion, 57% experienced at least a 2-point improvement in their average and worst phantom pain four weeks post-baseline, compared with 26% ($P < .001$) and 25% ($P < .001$) for those given a placebo infusion, respectively. The percentage of participants experiencing a clinically relevant improvement in phantom and residual limb pain varied by their baseline pain intensity, as those with severe pain at baseline (defined as numeric rating scale > 7) experienced a lower probability of a clinically meaningful improvement in both phantom and residual limb pain.

A network meta-analysis evaluated the effectiveness of various treatments for chronic phantom limb pain, analyzing 12 randomized controlled trials ($n = 783$). Continuous perineural block ranked third among all treatments for reducing pain, showing modest improvement compared to placebo (average pain reduction of 1.5, 95% confidence interval -3.10 to -0.10), based on the results of the Ilfeld (2021) study. This reduction approached but did not clearly surpass the minimal clinically important difference threshold of 1.7 to 2.0 established for chronic pain. Neuromodulation techniques, particularly repetitive transcranial magnetic stimulation, demonstrated greater effectiveness (average pain reduction of 2.9, 95% confidence interval -4.62 to -1.18). The authors noted limitations such as low number of studies for each treatment, differences in patient characteristics across trials, and lack of long-term outcome data (Chung, 2025).

The experience with ambulatory continuous peripheral nerve block in the perioperative pain settings offers some insight into its potential use for chronic pain. Regardless of technique or block location, major complications of peripheral nerve block, though rare, include vascular puncture and bleeding, nerve damage, infection, and local anesthetic systemic toxicity; minor complications involve catheter dislodgement, obstruction, and fluid leakage at the catheter site. Ambulatory support systems that are evidence-based and incorporate rapid diagnosis and early treatment algorithms can positively influence patient outcomes (Neal, 2015).

The complexity associated with an indwelling catheter and pump assembly raises the likelihood of technique failure. Successful home use of continuous peripheral nerve block depends on appropriate patient selection, adequate ambulatory care support to detect and address adverse events promptly, and education on pump management and catheter removal. While age alone is not an absolute exclusion criterion, patients for whom continuous peripheral nerve block may not be appropriate include those with (Ilfeld, 2011):

- Known renal and hepatic insufficiency to avoid possible local anesthetic toxicity.
- Heart disease, lung disease, or obesity in patients who may not be able to compensate for mild hypoxia or hypercarbia (interscalene and cervical paravertebral infusions).
- Altered mental status or psychosocial issues that prevent understanding of, or cooperation with, protocol and care requirements.
- Inability to be contacted after discharge or to access a medical facility in case of emergency.

In 2018, we updated the references. No policy changes are warranted. The policy ID was changed from CP# 10.02.06 to CCP.1347.

In 2019, we updated the references with no policy changes warranted. We identified no other newly published, relevant literature to add to the policy.

In 2020, we updated the references and added no new published information to the policy, which resulted in no material changes to the policy.

In 2021, we updated the references. These results warrant no policy changes.

In 2022, we updated the references and added content that did not change coverage.

In 2023, we updated the references. No policy changes are warranted.

In 2024, we updated the references and found no newly relevant published literature to add to the policy. No policy changes are warranted.

In 2025, we updated the references with no policy changes warranted.

In 2026, we updated the references and modified coverage to align with National Comprehensive Cancer Network treatment recommendations for adult cancer pain.

References

On March 10, 2026, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “Nerve block/methods (MeSH),” “Chronic pain (MeSH),” and free text terms “continuous peripheral nerve block,” “percutaneous nerve block,” and “perineural infusion.” We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

- 10/2017: initial review date and clinical policy effective date: 12/2017
- 10/2018: Policy references updated. Policy ID changed from CP# 10.02.06 to CCP.1347.
- 4/2019: Policy references updated.
- 4/2020: Policy references updated.
- 4/2021: Policy references updated.
- 4/2022: Policy references updated.
- 4/2023: Policy references updated.
- 4/2024: Policy references updated.
- 4/2025: Policy references updated.
- 4/2026: Policy references updated. Coverage modified.

Related codes

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy CCP.1347. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

Code	Code description
G9770	Peripheral nerve block (PNB)
64416	Injection(s), anesthetic agent(s) and/or steroid; brachial plexus, continuous infusion by catheter (including catheter placement)

Code	Code description
64446	Injection(s), anesthetic agent(s) and/or steroid; sciatic nerve, continuous infusion by catheter (including catheter placement)
64448	Injection(s), anesthetic agent(s) and/or steroid; femoral nerve, continuous infusion by catheter (including catheter placement)
64449	Injection(s), anesthetic agent(s) and/or steroid; lumbar plexus, posterior approach, continuous infusion by catheter (including catheter placement)