

Vitamin C for complex regional pain syndrome prophylaxis

Complex regional pain syndrome (CRPS), previously known as reflex sympathetic dystrophy (RSD) and causalgia, can be a debilitating complication of pain associated with limb trauma, including surgery. CRPS is associated with autonomic, sensory, and motor abnormalities, as well as physical changes to the skin and bone. Diagnosis is based on the Budapest Criteria (see box). CRPS can affect patients' work, social activities, and psychological well-being. If started early, available treatments can be effective, but some patients suffer indefinitely.

With limited treatments and often poor outcomes, prevention of CRPS would be ideal. A 1999 randomized, double-blind study proposed vitamin C as possible prophylaxis for CRPS after distal radius fracture. Subsequent studies varied in supporting these findings or found no difference in outcomes. A 2013 systematic review and meta-analysis found that vitamin C 500 mg daily for 45 to 50 days posttrauma may help reduce the occurrence of CRPS; while a 2015 meta-analysis of only three larger studies found no difference in outcome. The latter meta-analysis noted that one study showing no difference used different diagnostic criteria than the two that found vitamin C prophylactic (all used pre-Budapest criteria). A 2017 systematic review and meta-analysis found that vitamin C (500 mg daily for 50 days) may halve the risk of CRPS within the first year after a distal radius fracture.

So that's nice, but should we be giving vitamin C after distal radius fracture or foot and ankle trauma, the areas with the most research so far? The Royal College of Physicians in the UK updated its guidelines for diagnosis and

management of CRPS in 2018. While the College did not include vitamin C in the main section, appendix 7, Post-fracture/operation patient information leaflet, states that "Vitamin C 500 mg daily for the first 6 weeks may help to reduce the risk of complications." The American Academy of Orthopaedic Surgeons Clinical Practice Guidelines on Distal Radius Fractures recently downgraded the recommendation of adjuvant vitamin C to moderate, noting limitations in the available literature. And that probably says it best: the literature suggested that vitamin C may reduce the chance of developing CRPS but is not conclusive and further studies are needed. In the meantime, vitamin C (500 mg daily for 5 to 6 weeks) is extremely low risk and there is moderate evidence that it reduces the chance of developing a potentially debilitating complication. ■

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Suggested reading

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surgery—systematic review and meta-analysis. *J Foot Ankle Surg* 2013;52:62-66.

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Zollinger PE, Tuinebreijer WE, Kreis RW, Breederveld RS. Effect of vitamin C on frequency of reflex sympathetic dystrophy in wrist fractures: A randomised trial. *Lancet* 1999;354(9195):2025-2028.

Budapest criteria for CRPS

- Continuing pain, which is disproportionate to any inciting event.
- Report of at least one symptom in three of the four following:
 - Sensory—hyperesthesia and/or allodynia
 - Vasomotor—temperature asymmetry and/or skin color changes and/or skin color asymmetry
 - Sudomotor/edema—edema and/or sweating changes and/or sweating asymmetry
 - Motor/trophic—decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin)
- Evidence of at least one sign at time of evaluation in two or more of the following:
 - Sensory—hyperalgesia (to pinprick) and/or allodynia (to light touch and/or deep somatic pressure and/or joint movement)
 - Vasomotor—temperature asymmetry and/or skin color changes and/or skin color asymmetry
 - Sudomotor/edema—edema and/or sweating changes and/or sweating asymmetry
 - Motor/trophic—decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin)
- No other diagnosis that better explains the signs and symptoms.

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