



TODAY'S QUESTION:

Should I Prescribe Vitamin B6 for Everyone Receiving Chemotherapy?

Background:

Chemotherapy-induced peripheral neuropathy (CIPN) is a severe adverse effect that can result from cancer treatment with antineoplastic agents. CIPN often requires reductions in chemotherapy dose and frequency, which can lead to increases in cancer related death and treatment failure. Not only is CIPN painful it is also very common with a prevalence of 68% in the first month after chemotherapy. Vitamin B6 functions within the nervous system as a coenzyme for neurotransmitter synthesis and neuronal membrane synthesis. A deficiency in vitamin B6 is associated with nerve dysfunction and damage. It has been hypothesized that the use of vitamin B6, or pyridoxine, could prevent and even treat CIPN in patient at a higher risk.

Importance:

Palliative care providers often care for patients with chemotherapy-induced peripheral neuropathy. It is important to be aware of what preventative/treatment measures work and what measures do not. Currently many institutions use vitamin B6, or pyridoxine, as a supplement to prevent CIPN, but there is much debate as to the efficacy of this supplement.

The Literature:

- [Curr Oncol Rep. 2017 Oct 5;19\(12\):76.](#)
B Vitamin Complex and Chemotherapy-Induced Peripheral Neuropathy.
 - Mini review aimed to evaluate the literature on B vitamins and chemotherapy-induced peripheral neuropathy
 - **Recent Findings:** 9 articles included in review

Table 1 Journal articles for B vitamin complex and chemotherapy-induced peripheral neuropathy

Author	Year	Type of study	B vitamin	Chemotherapy agent	No of participants	Result
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Human studies						
Wiernik PH, Yeap B, et al. [12]	1992	RCT	Vitamin B ₆	Cisplatin, HMM	248	Pyridoxine administration of 300 mg orally from day 1-21 significantly reduced the neurotoxicity but was found to interfere with response duration.
Rostock M, Jaroslowski K, et al. [13]	2013	RCT	Vitamin B ₁₂ , B ₆	CIPN from various agents	14	Four-arm trial on cancer patients with CIPN. n = 14 with electric acupuncture, n = 14 with hydroelectric baths, n = 15 with vitamin B ₆ /B ₁₂ (30 mg/300 mg daily), n = 17 placebo. No significant differences were noted for all groups compared to placebo.
Hirayama Y, Ishitani K, et al. [14**]	2015	Open label crossover RCT	Vitamin B ₁₂ versus duloxetine	Taxane or platinum-based CIPN	34	Group A received duloxetine 20 mg/day orally for 1 week, then 40 mg/day for the next 3 weeks. Group B received vitamin B ₁₂ 1.5 mg/day orally for 4 weeks. After 2- to 4- week washout period, treatment was crossed over for another 4 weeks. Duloxetine was superior to B ₁₂ for numbness (p = 0.03) and pain reduction (p = 0.04).
Schloss JM, Colosimo M, et al. [9]	2015	Case study	Vitamin B ₁₂ and B complex	Paclitaxel	1	A case study on a patient in a trial showed vitamin B ₁₂ deficiency post-taxane chemotherapy with grade 3/4 CIPN. Administration of IM vitamin B ₁₂ and a vitamin B complex for 3 months reversed CIPN to Level 1 (in finger tips and top of toes).
Soloman L. [5**]	2016	Retrospective study	Vitamin B ₁₂		241	Palliative care patients with CIPN and neuropathic pain were evaluated for functional vitamin B ₁₂ deficiency through homocysteine and MMA and B ₁₂ status. B ₁₂ therapy decreased MMA and improved neurologic symptoms.
Schloss JM, Colosimo M, et al. [15]	2017	RCT	B vitamin Complex	Paclitaxel, vincristine, Taxol/carboplatin	71	Placebo controlled trial assessing the protective effect of B vitamins for CIPN. A trend was observed, particularly for vitamin B ₁₂ in reducing the onset and severity, but no statistical significance on the TNS was found. Significance was found for patient reported reduced sensory CIPN with the B vitamin complex.
Han X, Wang L, et al. [16]	2017	RCT	Vitamin B ₁₂	CIPN treatment after multiple myeloma Tx	104	Patients randomised into: Group A: 500mcg IM methylcobalamin every second day for 20 days followed by 2 months of 500mcg oral methylcobalamin TDS (1.5 mg/day) Group B: acupuncture combined with methylcobalamin (same regime). Results found the combination of acupuncture and methylcobalamin showed a better outcome than methylcobalamin alone.

- Conclusion: “Currently, there are still no conclusive protective or treatment options. B vitamins have been found to play a role in CIPN prevention, but further studies are required to ascertain possible protection and treatment options

- [Evid Based Complement Alternat Med. 2013;2013:349653.](#)

Chemotherapy-induced peripheral neuropathy in cancer patients: a four-arm randomized trial on the effectiveness of electroacupuncture.

- Methods: Randomized, placebo-controlled study comparing German remission cancer patients after receiving chemotherapy with taxanes, platinum derivatives, or vinca alkaloids and have symptoms of CIPN.
- Results: CIPN complaints improved by 0.8 ± 1.2 (EA), 1.7 ± 1.7 (HB), 1.6 ± 2.0 (VitB), and 1.3 ± 1.3 points (placebo) on a 10-point numeric rating scale without significant difference between treatment groups or placebo. In addition no significant differences in sensory nerve conduction studies or quality of life (EORTC QLQ-C30) were found.
- Conclusion: “VitB was not superior to placebo”
- Discussion: In this study patients were evaluated via detailed questionnaire before the start of therapy, after therapy on day 21 and during follow-up on day 84 about extension and intensity of their CIPN, so this study had a sufficient duration

So... What does this all mean Jenn Bianca?

- Vitamin B6 supplementation does not appear to prevent or treat CIPN although more research is necessary
- A recent study (<https://clinicaltrials.gov/ct2/show/NCT00659269>) completed in 2016 also did not show an improvement

- If you are considering utilizing this treatment modality, check a patient's B6 levels first. Deficiencies would be the only reason to treat with supplementation.
- We are still searching for a way to prevent CIPN, but until then we can continue to treat patients with medications that show effectiveness like duloxetine (see previous PCP Phast Phacts regarding the management of CIPN – remember gabapentin has not been shown to be effective!)

Geriatric Considerations:

- Although not supported by evidence, older adults may be at higher risk of vitamin B6 deficiencies, therefore may be appropriate for vitamin B6 therapy. As above consider testing for this deficiency before treatment

Stay tuned for future PCP Phast Phact on CIPN!

CLINICAL PEARL:

There is insufficient evidence to support the role of vitamin B6 for the prevention or management of CIPN.