

Table 1: Randomized controlled trials of L-carnitine, acetyl-L-carnitine and propionyl-L-carnitine for cancer

Source: CAM-Cancer Consortium. L-Carnitine, [online document]. L-Carnitine | CAM Cancer (cam-cancer.org), December 2024

Author	Study design	Participants	Treatment	Outcomes	Results	Risk of bias
Campane 2013	Randomized, two arms, parallel, blinded, placebo control, 12 weeks follow-up	150 patients with ovarian or prostate cancer	Intervention: ALC 3x1g/day, daily during chemotherapy with sagopilone Control: placebo	CIPN incidence	CIPN incidence unchanged	low
Cavallini 2005	Randomized, three arms, parallel, blinded, placebo control, four months follow-up	96 men with erectile dysfunction after bilateral nerve-sparing radical retropubic prostatectomy for prostate cancer at least six months ago	Intervention: (1) Sildenafil 100mg (when needed); (2) Sildenafil 100mg + ALC 2g/day and PLC 2g/day (when needed) Control: placebo	IIEF Self-report of satisfactory sexual intercourse	IIEF increased Satisfactory intercourse increased	moderate
Cruciani 2009	Randomized, two arms, parallel, blinded, placebo control, two weeks follow-up	29 patients with various advanced malignancies (stage unclear), moderate to severe CrF, low plasma carnitine levels and low performance status	Intervention: LC 0.5g/day for two days, then 1g for two days, then 2g for 10 days Control: placebo	CrF Performance status	CrF unchanged (blinded phase) Performance status unchanged (blinded phase)	moderate
Cruciani 2012	Randomized, two arms, parallel, blinded, placebo control, four weeks follow-up	326 patients with invasive malignancies and moderate to severe fatigue	Intervention: LC 1g/day (oral liquid) twice daily for 4 weeks Control: placebo	CrF (BFI/FACIT-F) Pain (BPI) Depression (CES-D)	CrF unchanged Pain unchanged Depression unchanged	low
Hershman 2013	Randomized, two arms, parallel, blinded, placebo control, 24 weeks follow-up	409 women with breast cancer undergoing adjuvant taxane-based chemotherapy	Intervention: ALC 3g/day for 24 weeks Control: placebo	CIPN (FACT-NTX) Functional status (FACT-TOI) CrF (FACIT-F)	CIPN was significantly increased after 24 weeks Functional status increased CrF unchanged	low

Hershman 2018	2 years follow-up of Hershman 2013	See above.	Follow-up	Recovery of CIPN (FACT-NTX)	No significant differences in recovery of CIPN after 2 years follow-up	low
Kraft 2012	Randomized, two arms, parallel, blinded, placebo control, 12 weeks follow-up	72 patients with advanced pancreatic cancer	Intervention: LC 4g/day orally for 12 weeks Control: placebo	BMI Nutritional status QoL CrF	BMI increased Nutritional status increased Cognitive function (subgroup of QoL) CrF unchanged	moderate
Lissoni 1993	Randomized, two arms, parallel, no-treatment control, 18 weeks follow-up	30 patients with various metastatic cancers and concomitant heart diseases during high-dose interleukin-2 therapy	Intervention: LC 1g/day orally Control: no treatment	Cardiac symptoms/ ECG Other	Fewer cardiac complications	high
Mondal 2014	Randomized, four arms, parallel, nonblinded, control, 24 weeks follow-up	160 patients with lung, breast or ovarian cancer receiving either carboplatin or doxorubicin and cyclophosphamide as first- or second-line chemotherapy in addition to paclitaxel	Intervention: ALC 250mg/d, day 1-7 of each chemotherapy cycle Control: The other 3 groups received either vitamin E, glutamine or vitamin B12	CIPN symptoms (pain, sensory and motor function CTCAE 4.02)	In the patients who had received vitamin B12 or vitamin E, change in CIPN symptoms significantly lower than in those who had taken L-carnitine or glutamine	low
Sun 2016	Randomized, two arms, parallel, blinded, placebo control, 8 weeks follow-up	240 patients with various tumours and physician-assessed polyneuropathy grade ≥ 2 or 3 (NCI-CTC version 3.0) that occurred during chemotherapy with paclitaxel, cisplatin or vinblastine and persisted for at least one month after therapy	Intervention: ALC 3 *1g/day for 8 weeks Control: placebo	CIPN (NCI-CTC version 3.0) Nerve conduction velocity	significant improvement in CIPN defined as an improvement ≥ 1 grade (NCI-CTC version 3.0). Better regeneration of nerve conduction velocities in the L-carnitine group	low

Waldner 2006	Randomized, two arms, parallel, blinded, placebo control, 18 weeks follow- up	40 patients with different non- Hodgkin lymphoma	Intervention: LC 3g before each chemotherapy cycle followed by 1g/d during the following 21days for six cycles Control: placebo	ECG Survival QoL	ECG no differences Survival no differences QoL no differences	moderate
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ALC = Acetyl-L-carnitine

BFI = Body fat index

BMI = Body mass index

BPI = Brain performance index

CES-D = Centre for Epidemiologic Studies Depression Scale

CIPN = Chemotherapy-induced neuropathy

CrF = Cancer-related fatigue

CTC = Common toxicity criteria

ecECG = Echocardiography

FACIT-F = The Functional Assessment of Chronic Illness Therapy – Fatigue scale

FACT-NTX = Functional Assessment of Cancer Therapy - Neurotoxicity

FACT-TOI = Functional Assessment of Cancer Therapy - Trial Outcome Index

IIEF = International Index of Erectile Function

LC = L-carnitine

NCI = National Cancer Institute

PLC = Propionyl-L-carnitine

QoL = Quality of life