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# Personalized exercise to prevent chemotherapy-induced peripheral neuropathy: protocol for a randomized controlled trial (CIPN-EX Trial)

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Background: Chemotherapy-induced peripheral neuropathy (CIPN) is a common side effect of neurotoxic cancer treatments, primarily affecting sensory and motor functions in hands and feet. CIPN can interfere with daily activities and cancer treatment. Exercise may represent a promising approach to CIPN prevention; however, it is not currently reflected in international guidelines because evidence remains limited.

Objective: This randomized controlled trial (RCT) aims to determine the effectiveness of a personalized exercise program combining sensorimotor, strength, and aerobic training to prevent CIPN during taxane- or platinum-based chemotherapy. A secondary aim is a process evaluation investigating program barriers and facilitators (NCT06962579).

Methods: Patients with breast or colon cancer (n=206) scheduled for taxane- or platinum-based chemotherapy are randomized to usual care (control) or exercise (intervention). All participants receive an educational session on physical activity during chemotherapy and an activity tracker for 24 weeks. The intervention group follows a 12-week personalized exercise program: supervised sensorimotor and strength training twice weekly plus home-based aerobic sessions. The program is based on oncology exercise guidelines and the PREFERABLE II LION RCT (NCT06270628).

Results: The first patient was enrolled on June 5th, 2025. CIPN sensory symptoms (EORTC QLQ-CIPN20, primary outcome), motor and autonomic CIPN symptoms, CIPN signs, chemotherapy dose intensity, and physical and psychosocial functioning are assessed at baseline (prior to chemotherapy) and at 12 (primary endpoint) and 24 weeks. The effects of the exercise intervention will be analyzed using a linear mixed model. In addition, qualitative interviews with patients and health care providers will be analyzed using inductive and deductive approaches to identify barriers and facilitators.

Conclusion: This trial will provide evidence on the effectiveness of exercise for CIPN prevention during chemotherapy and identify factors influencing adherence and implementation. Results may inform evidence-based exercise recommendations and support integration of exercise into supportive cancer care to reduce CIPN burden.

## Keywords

chemotherapy-induced peripheral neuropathy, exercise, integrative oncology, prevention

## Conflict of Interest & Ethical Approval

yes

## Abstract submitters declaration

yes

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