Standardized Limb Cryotherapy Protocol for Chemotherapy-Induced Peripheral Neuropathy: An Evidence-Based Intervention in Oncology Care

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BACKGROUND

- Chemotherapy-Induced Peripheral Neuropathy (CIPN) is a dose-limiting neurotoxic side effect of chemotherapy.
- Bilateral numbness, tingling, or burning in a glove-and-sock distribution, with possible progression to motor weakness, gait imbalance, and impaired fine motor coordination.
- CIPN presents most frequently in patients receiving taxane- and platinum-based chemotherapy, affecting >85% of treated individuals.
- Over one-third develop chronic neuropathy, leading to functional decline, treatment modifications, and reduced quality of life.

LOCAL PROBLEM

- Management was mainly reactive and palliative.
- No standardized CIPN prevention protocol was in place.
- Inconsistent screening for cryotherapy eligibility and risk.
- Patients lacked access to preventive interventions.

METHODS

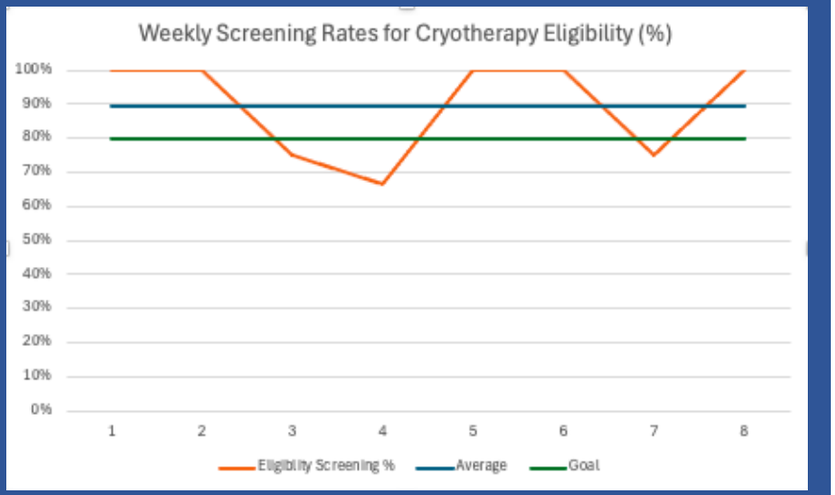
- Guided by the Evidence-Based Practice Improvement Plus (EBPI+) Model.
- Modified PDSA Design: Implemented at site level, treating the clinic as the unit of change.
- American Society of Clinical Oncology (ASCO) standards recommend routine CIPN monitoring using validated tools.

MEASURES

Specific Aims

1. ≥80% of adult cancer patients starting high-risk neurotoxic chemotherapy will be screened for eligibility on or before C1D1.
2. ≥80% of eligible patients will receive cryotherapy with frozen hand and foot wraps beginning C1D1 and continuing through all cycles
3. ≥75% of cryotherapy recipients will report *Common Terminology Criteria for Adverse Events version 5.0 (CTCAEv5.0) neuropathy grade ≤2.*
4. ≥75% of patients will maintain a stable quality of life (< 10-point increase in QLQ-CIPN20 scores).

Standardized limb cryotherapy improves neuropathy outcomes and preserves quality of life.



INTERVENTIONS

Cryotherapy device: SMI Cold Therapy Chemotherapy Infusion Cooling Wrap
Standardized Cryotherapy protocol :

- Pre-screening eligibility checklist to identify possible contraindications.
- Frozen hand & foot wraps applied 15 minutes before, during, and removed 15 minutes after completion of infusion, beginning day 1 and at each subsequent cycle.
- Validated, standardized assessment tools were utilized to systematically guide clinical management and monitor symptom severity and progression.
  1. *Common Terminology Criteria for Adverse Events version 5.0 (CTCAEv5.0).*
     - A grading system used to classify and quantify the severity of adverse events associated with cancer therapy.
     - Embedded within the electronic medical record (EMR).
  2. European Organization for Research and Treatment Quality-of-Life Chemotherapy-Induced Peripheral Neuropathy 20-Item Scale (QLQ-CIPN20)
     - A patient-reported outcome measure that assesses the sensory, motor, and autonomic impact of CIPN on quality of life.
     - Printed and administered to each patient prior to chemotherapy initiation and following completion of the final chemotherapy cycle.

RESULTS

Specific Aim 1

- 92% of patients initiating high-risk neurotoxic chemotherapy were screened for eligibility on or before C1D1.

Specific Aim 2

- 96% of patients received cryotherapy on C1D1, and at each subsequent cycle.
- 1 patient began cryotherapy on C2D1 after initially declining intervention.

Specific Aim 3

- 96% of patients reported no neuropathy.
- 1 patient reported Grade 1 neuropathy (no change from baseline)

Specific Aim 4

- 100% of patients maintained a stable quality of life
- Greatest QLQ-CIPN20 score change: +2 points

CONCLUSIONS

- The cryotherapy protocol was easily integrated into routine oncology care.
- Strong collaboration between nursing and support led to consistent implementation.
- Cryotherapy demonstrated potential to preserve neurologic function and quality of life during chemotherapy.
- Findings highlight the value of evidence-based, nurse-led interventions in improving supportive cancer care.
- The project team will work with the organization to refine and permanently integrate the protocol into the clinical workflow.