

Standardizing Extremity Cooling in Oncology

An Evidence Informed Approach to CIPN Prevention Using SMI Chemo Cooling Wraps

WHITE PAPER

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Executive Summary

Chemotherapy-induced peripheral neuropathy can affect sensation, mobility, dexterity, independence, treatment tolerance, and quality of life. Extremity cryotherapy has emerged as a promising nonpharmacologic strategy for patients receiving selected neurotoxic chemotherapy. The practical challenge for oncology programs is not simply whether cooling is available, but whether it can be delivered consistently, safely, efficiently, and measurably across infusion chairs and practice locations.^{1,2}

A 2026 Tennessee Oncology evidence-based quality-improvement project offers encouraging real-world evidence. During an eight-week implementation of a standardized, nurse-led limb cryotherapy protocol, 92% of eligible patients were screened by Cycle 1, Day 1; 96% initiated cryotherapy on that day and continued with each cycle; 96% reported no neuropathy; and 100% maintained stable quality of life on the QLQ-CIPN20. The project reported minimal workflow disruption and no treatment delays.³

These findings do not establish definitive product-specific efficacy. The project was conducted at one site with a small sample and short follow-up. They do, however, demonstrate that a structured extremity-cooling program can be incorporated into outpatient oncology care with high utilization and measurable outcomes. SMI Chemo Cooling Wraps provide a practical platform for building that repeatable supportive-care pathway.

The Clinical Need

CIPN is a common, potentially persistent adverse effect of taxane-, platinum-, and other neurotoxic chemotherapy. It often presents as bilateral numbness, tingling, burning, pain, or weakness in a glove-and-sock distribution. Symptoms may interfere with walking, balance, fine motor tasks, work, sleep, and normal daily activities. In more severe cases, neuropathy can contribute to dose modification or discontinuation, creating a difficult tradeoff between treatment intensity and long-term function.^{1,4}

Pharmacologic options for preventing CIPN remain limited. This has increased interest in nonpharmacologic approaches, including cooling of the hands and feet during infusion. Local cooling produces vasoconstriction and is intended to reduce blood flow and chemotherapy exposure in distal tissues during treatment. Evidence varies by regimen and cooling method, and patient selection remains a clinical decision. Even so, a growing body of research supports continued implementation and evaluation of extremity cryotherapy, particularly with taxane-based therapy.^{2,5}

Why Standardization Matters

Evidence alone does not create a reliable clinical program. When patients purchase different gloves, bring ice from home, or follow different cooling schedules, variability enters the intervention. Products can differ in coverage and thermal performance. Application, compression, duration, monitoring, and replacement schedules may vary. Nurses may be asked to support unfamiliar products, while patient education and documentation remain inconsistent.

A standardized program replaces this variability with defined decisions: who is eligible, when cooling begins and ends, how wraps are applied, how compression is adjusted, how skin and tolerance are monitored, what is documented, and when cooling should be modified or stopped.

Screen > Educate > Prepare > Apply > Monitor > Remove > Document

This approach transforms cooling from an informal option into a defined supportive-care workflow. It also makes performance measurable across patients and sites.

A Practical Platform for Consistent Delivery

SMI Chemo Cooling Wraps are designed for reusable cooling of the hands and feet during chemotherapy. The system combines hand and foot wraps, reusable gel bags, adjustable compression straps, and a protective antimicrobial liner. Broad coverage includes the fingertips and toes, while adjustable straps allow fit and compression to be managed according to clinical protocol and patient tolerance.

Standardizing around one system can provide several operational advantages:

- **Consistent application.** Staff learn one preparation and placement method instead of troubleshooting multiple consumer products.
- **Defined nursing workflow.** Application, monitoring, removal, and documentation can be integrated into the infusion process.
- **Consistent patient education.** Patients receive the same explanation of purpose, expected sensations, safety checks, and reporting expectations.
- **Measurable outcomes.** A common intervention supports more meaningful comparison of CIPN severity, adherence, tolerability, and quality of life.
- **Scalability.** A successful process can be replicated across infusion chairs, locations, and health-system practices.

Tennessee Oncology Quality Improvement Results

Tennessee Oncology implemented a standardized, nurse-led limb cryotherapy protocol for adults receiving neurotoxic chemotherapy. The project addressed an identified practice gap: the clinic lacked a consistent process for CIPN identification, prevention, and management. The intervention incorporated screening, eligibility assessment, patient education, cryotherapy initiation on Cycle 1, Day 1, continued use during subsequent cycles, and standardized outcome measurement.³

Measure	Eight week result
Screened on or before Cycle 1 Day 1	92 percent
Initiated on Cycle 1 Day 1 and continued each cycle	96 percent
Reported no neuropathy	96 percent
Maintained stable QLQ CIPN20	100 percent
Infusion workflow	Minimal disruption
Treatment schedule	No delays

Source: Tennessee Oncology evidence-based quality-improvement project³

The results are important for two reasons. First, they provide encouraging patient-reported outcomes during implementation. Second, they show operational feasibility: nurses achieved high screening and utilization while the clinic reported minimal workflow disruption and no treatment delays. The project concluded that nurse-led standardization enhanced consistency and feasibility and that the protocol was suitable for permanent integration and expansion.³

Emerging Evidence Involving SMI Wraps

The Tennessee Oncology evidence review also cited a 2024 Advocate Health evidence-based practice initiative involving SMI limb cryotherapy wraps. According to the presentation, only 2% of participating patients developed severe CIPN. The Advocate work, titled Freezing Chemo Induced Neuropathy in Its Tracks, was presented at the Advocate Health Midwest Region Nursing Research and Professional Development Conference and later appeared as an abstract in Oncology Nursing Forum.^{3,6,7}

Together, the Tennessee Oncology and Advocate Health experiences provide an emerging real-world evidence base for standardized limb cryotherapy and continued evaluation of SMI wraps. The findings should be interpreted within their study designs. They are not substitutes for large randomized controlled trials, and they should not be presented as definitive proof that SMI wraps prevent CIPN. Their value lies in demonstrating promising outcomes, feasibility, protocol adherence, and the ability to incorporate cooling into routine oncology care.

Making Outcomes Measurable

Standardization allows oncology practices to evaluate performance rather than rely on anecdotal impressions. A common protocol can track CIPN incidence and severity, CTCAE grade, QLQ-CIPN20 or other patient-reported outcomes, adherence, tolerance, skin events, dose modifications, treatment delays, and nursing workflow impact. The Tennessee Oncology project illustrates the value of this approach: standardized screening and assessment allowed the team to quantify both clinical and operational measures.³

Measurement also supports continuous improvement. A practice can identify where eligible patients are missed, whether application varies by location, when patients discontinue cooling, and how outcomes compare across regimens or cycles. This creates accountability while giving leadership a clearer basis for decisions about expansion.

Implementation Priorities

A clinic adopting extremity cooling should build the program around clinical governance rather than the product alone. At minimum, the protocol should define eligibility and contraindications; timing in relation to infusion; wrap preparation, placement, and exchange; compression adjustment; skin and comfort checks; escalation and discontinuation criteria; cleaning and storage; documentation; and validated outcome assessment. Education should prepare both nurses and patients to recognize expected cold sensations and report pain, numbness beyond the intended effect, skin changes, or poor tolerance.

The goal is not to cool every patient automatically. Evidence and safety considerations differ by chemotherapy regimen, and the treating team must determine whether cryotherapy is appropriate. The objective is consistency when cooling is selected as part of care.

Conclusion

CIPN can have lasting consequences for function, independence, treatment experience, and quality of life. Extremity cryotherapy offers a promising supportive-care strategy, but its clinical value depends on reliable delivery. The Tennessee Oncology experience shows that a standardized, nurse-led protocol can achieve high utilization, favorable reported neuropathy outcomes, stable quality of life, minimal workflow disruption, and no treatment delays, while also highlighting the need for larger and longer studies.³

SMI Chemo Cooling Wraps provide a practical platform for that standardized approach: one cooling system, one application process, one nursing workflow, one documentation standard, and one method for measuring outcomes. The opportunity is to move beyond optional, variable icing and establish an evidence-informed pathway that is consistent, teachable, measurable, scalable, and centered on patient safety and quality of life.

References

1. Starobova H, Vetter I. Pathophysiology of chemotherapy-induced peripheral neuropathy. *Frontiers in Molecular Neuroscience*. 2017;10:174. doi:10.3389/fnmol.2017.00174.
2. Peterson JD, Clark C. Extremity Cooling for Peripheral Neuropathy Prevention: A Rapid Synthesis of Evidence. *Clinical Journal of Oncology Nursing*. 2026;30(2):96-100. doi:10.1188/26.CJON.96-100.
3. Kearney M, Brown C, Steinfeld M. Standardized Limb Cryotherapy Protocol for Chemotherapy-Induced Peripheral Neuropathy: An Evidence-Based Intervention in Oncology Care. Evidence-based quality-improvement project presentation. *Tennessee Oncology*; 2026.
4. Loprinzi CL, Lacchetti C, Bleeker J, et al. Prevention and Management of Chemotherapy-Induced Peripheral Neuropathy in Survivors of Adult Cancers: ASCO Guideline Update. *Journal of Clinical Oncology*. 2020;38(28):3325-3348. doi:10.1200/JCO.20.01399.
5. Jordan B, Margulies A, Cardoso F, et al. Systemic anticancer therapy-induced peripheral and central neurotoxicity: ESMO Clinical Practice Guidelines. *Annals of Oncology*. 2020;31(10):1306-1319. doi:10.1016/j.annonc.2020.07.003.
6. Granada A, Turri A. Freezing Chemo Induced Neuropathy in Its Tracks. Evidence-based practice poster presented at the Advocate Health Midwest Region Nursing Research and Professional Development Conference; November 13, 2024.
7. Granada A, Turri A. Freezing Chemo Induced Neuropathy in Its Tracks P232. *Oncology Nursing Forum*. 2025;52(2):140.

Clinical use notice

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