# Cooling or Compressing Hands During Chemo Can Prevent Neuropathy

Using frozen or tight gloves to limit blood flow to the hands during chemotherapy reduced the likelihood of painful nerve damage.

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Women who wear frozen or tight-fitting gloves during taxane-based chemotherapy for breast cancer are less likely to develop painful peripheral neuropathy, according to research published in JAMA Oncology. While both methods were effective, compression is more accessible and may be better tolerated than cold temperature.

Cytotoxic chemotherapy is an effective treatment for many types of cancer, but the medications can harm or kill normal cells along with malignant cells, leading to side effects. Taxane drugs, such as paclitaxel (Taxol), which interfere with cell division, are especially likely to cause peripheral neuropathy, or damage to nerves in the extremities. Symptoms—which can persist long after the end of treatment—may include pain, burning, tingling, numbness or reduced sensation in the hands and feet, which can interfere with daily activities and quality of life. What's more, chemo doses may need to be reduced to lessen neuropathy, which can compromise treatment effectiveness.

One way to prevent neuropathy is to limit the circulation of blood to the hands and feet during chemo, which decreases the amount of toxic drugs that reach the peripheral nerves. This may be accomplished by wearing chilled or tight-fighting gloves or socks that reduce blood flow. A similar approach uses tight-fitting cooling caps to prevent chemo-induced hair loss.

Laura Michel, MD, of University Hospital and the German Cancer Research Center in Heidelberg, and colleagues evaluated whether cooling or compression of the hands could reduce peripheral neuropathy among women undergoing chemo for breast cancer. (Results from this trial were previously presented in part at the 2022 European Society for Medical Oncology Congress.)

The POLAR study (NCT06541769) included 122 patients undergoing weekly chemotherapy using paclitaxel or nab-paclitaxel (Abraxane) before or after surgery. The median age was 50 years. Some participants also received other types of chemotherapy, trastuzumab (Herceptin) or immune checkpoint inhibitors. Women with prior chemotherapy or preexisting neuropathy were excluded.

The study participants were randomly assigned to receive either cooling or compression of their dominant hand, with no intervention for the other hand. The cooling group wore a frozen gel glove while the compression group wore two tight-fitting surgical gloves. The gloves were worn for 30 minutes prior to chemotherapy, during infusions and for 30 minutes afterwards.

The primary study endpoint was prevention of moderate to severe (grade 2 or higher) peripheral neuropathy, assessed using standard questionnaires. The researchers also assessed skin problems, nail damage and quality of life, as well as the need for chemo dose reduction or treatment discontinuation. Follow-up was performed one week, one month and six to eight months after the last chemo dose; 21 women withdrew from the study early, so 52 patients in the cooling group and 49 in the compression groups were included in the final analysis.

The study showed that hand cooling and compression were both effective for preventing painful peripheral neuropathy. In the cooling group, 15 people (29%) experienced high-grade neuropathy in the treated hand compared with 26 (50%) in the untreated hand at one month. In the compression group, 12 people (24%) experienced painful neuropathy in the treated hand compared with 19 (38%) in the untreated hand. Both differences were statistically significant.

Neuropathy symptoms decreased over time with or without treatment. At six to eight months after the last chemo dose, few women in either group still hand painful neuropathy in the treated or untreated hand, and the numbers were too small to draw valid statistical conclusions about long-term effectiveness.

The main neuropathy risk factors were the cumulative dosage of taxane chemotherapy and use of drugs known to be more neurotoxic. Participants who developed moderate to severe neuropathy reported reduced overall health status during treatment and for six to eight months thereafter.

Both methods were safe and generally well tolerated, but more women had trouble tolerating hand cooling. Painful neuropathy was the main reason for early treatment discontinuation. Of the nine people who dropped out in the cooling group, six cited intolerance of the frozen gloves. Of the 12 who dropped out in the compression group, only one cited intolerance of the tight gloves.

An additional advantage of the compression method is that tight surgical gloves are cheap and readily available, whereas frozen gel gloves can be expensive and must be prepared in advance.

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