

NITRO: Chemotherapy and nitroglycerin for lung cancer

The NITRO trial has helped answer an important question about the treatment of lung cancer. It has shown that using a nitroglycerin patch does not benefit people having chemotherapy for non-small-cell lung cancer.

We appreciate the part played by our volunteer participants. Their contribution improves the medical treatment of patients in the future. Here is a summary of the trial and results.

What was the trial about?

The trial was part of the search for better treatments for patients with advanced non-small-cell lung cancer.

The current standard treatment for advanced non-small-cell lung cancer is combination chemotherapy with two anticancer drugs.

Nitroglycerin improves blood flow and may help chemotherapy and radiotherapy work against tumours. Nitroglycerin is widely used to treat heart disease and has few side-effects. In an earlier lung cancer trial, patients treated with chemotherapy plus nitroglycerin did better than patients treated with chemotherapy alone. The results were promising, but the trial was small and a bigger trial was needed.

NITRO was designed to provide a reliable answer to the question: does adding nitroglycerin to standard chemotherapy improve survival in people starting chemotherapy for newly diagnosed, advanced non-small-cell lung cancer?

Participants were randomly allocated to chemotherapy plus nitroglycerin patches, or to chemotherapy alone.

The average age of the participants was 64, 40% were women, and two-thirds had smoked within the past 15 years.

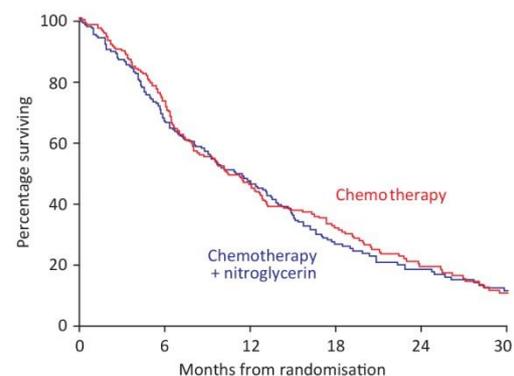
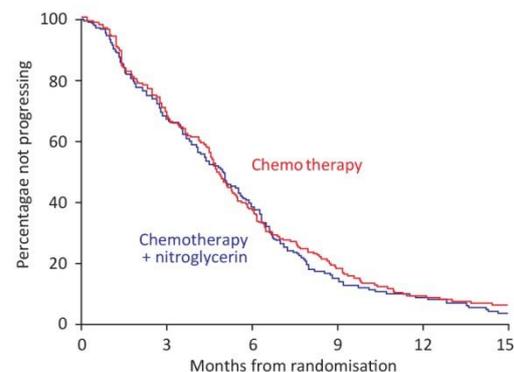
How was the effect of treatment measured?

The main measure was progression-free survival time—that is, the time from entering the trial until a scan showed that their disease had worsened. Overall survival time was another important measure.

The investigators also measured the response of the tumour to the treatment. The size of the tumour was measured with scans. The tumour was counted as responding if its size dropped by 30% or more.

Was the new treatment better?

The final results for all 372 participants showed that adding nitroglycerin did not improve the effects of chemotherapy. The two treatment groups had similar survival times (the red and blue lines in each graph look very much the same). 31% in each group responded to the treatment



The two groups were similar for progression-free survival (top) and overall survival (bottom).

What were the side-effects of the treatment?

Participants in both groups had the expected side-effects of chemotherapy, such as fatigue, reduced appetite, and low blood counts.

The participants in the nitroglycerin group were more likely to have headaches, low blood pressure and fainting.

Were there any serious side-effects?

Serious side-effects of chemotherapy were rare and equally common in both treatment groups. About 60% of participants required a hospital admission at some point during their treatment, mostly to treat possible infections, or to treat symptoms from their cancer

What does this mean for trial patients?

The trial has proven that using nitroglycerin does not improve standard chemotherapy for advanced lung cancer. The use of nitroglycerin was not beneficial, but it had few side-effects.

How will the results help patients and doctors in future?

The evidence from NITRO will help doctors and patients to make better decisions about treatment in future. That is, they will know that nitroglycerin is unhelpful, despite the apparently promising results from a small earlier study.

Two other trials of this treatment have recently finished. They had similar results to NITRO. The NITRO investigators have therefore recommended that in future, people with non-small-cell lung cancer not be treated with nitroglycerin.

What will the researchers do next?

Future trials should look at other ways of improving the treatment of people with advanced non-small-cell lung cancer.

Where can I find out more about the trial?

Talk with your GP or oncologist.

The results have been published in a scientific journal

Davidson A, and others. A phase 3 randomized trial of adding topical nitroglycerin to first line chemotherapy for advanced non-small-cell lung cancer: the Australasian Lung Cancer Trials Group NITRO trial. *Annals of Oncology* 2015; volume 26, issue 11: pages 2280–2286. [Link to summary](#)

Trial registration

Australian New Zealand Clinical Trials Registry
anzctr.org.au
Search for number 12608000588392

Australasian Lung Cancer Trials Group

altg.com.au

The sponsor was the Australasian Lung Cancer Trials Group (ALTG), and the trial was coordinated by the Clinical Trials Centre at the University of Sydney.

The study was funded by Cancer Australia, the National Health and Medical Research Council and the Cancer Council of New South Wales. It had no commercial funding, although Novartis provided the nitroglycerin patches. The investigators report no conflict of interest.

Results of any clinical trial do not represent complete knowledge about treatment. Patients should not change their therapy on their understanding of the results.