

Lung cancer:

What is immunotherapy?



Lung
Foundation
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If you have been diagnosed with advanced non-small cell lung cancer your oncologist may consider a treatment called immunotherapy. Immunotherapy is a type of treatment that activates the body's own immune system to fight cancer.

Cancer starts when abnormal cells begin growing out of control. The immune system usually prevents cancers from developing because it recognises abnormal or mutated cells and destroys them. However, sometimes the immune system response does not fight against cancer.

This can occur for a few different reasons:

- Cancer comes from normal cells that have changed (mutated) and therefore the immune system may not see the cancer as a cell that should be destroyed
- Cancer cells can trick the immune system so it cannot recognise the abnormal cell to fight the cancer as it normally would.

The goal of immunotherapy is to boost or “fire up” the immune system so it will identify, attack and kill cancer cells. This breakthrough therapy is improving quality of life (and in some instance overall survival) for people living with lung cancer. There are a number of different types of immunotherapy treatments used to treat cancer, with the most common known as checkpoint inhibitors.

What are checkpoint inhibitors?

While it is important for our immune system to recognise threats (including cancer cells) and act to remove them, it is just as important that our immune response is not so strong that it destroys healthy cells.

A key part of our body's immune response is a T cell. It is a type of white blood cell that helps to tailor the body's immune response to specific invaders.

Proteins on the surface of T cells recognise and attach to partner proteins on the surface of other cells. When these proteins bind together a “checkpoint” is formed which stops the T cell from identifying the cell as an invader and destroying it. Sometimes, cancer cells also have these checkpoints, and trick the T cells so they will not recognise them as a threat. Immunotherapy drugs block these proteins on cancer cells, thereby allowing the T cell to recognise the cancer cell as a threat and destroy it ^[2].

In Australia, there are a number of immunotherapies or checkpoint inhibitors approved for use in advanced non-small cell lung cancer.

These include:

- pembrolizumab
- nivolumab
- durvalumab
- atezolizumab.

Most patients who receive immunotherapy treatment for lung cancer are on a type of a checkpoint inhibitor.

Cancers sometimes make a protein called PD-L1 (Programmed Death-Ligand 1).

Immunotherapy treatment targets either the PD-L1 or the PD-1 partner protein, stopping (inhibiting) the checkpoint from turning on. This allows T cells to recognise and destroy the cancer cell.

At diagnosis, a biopsy of your lung cancer will be performed to test your cancer cells for the PD-L1 protein as well as for other changes in your genes (known as mutations). If you have metastatic lung cancer (cancer that has spread

outside of the lungs) as well as the PD-L1 protein in more than half (50%) of your lung cancer cells, immunotherapy is known to be a very effective treatment, and can be commenced straight away.

If you do not have the PD-L1 protein or any other mutation on your lung cancer cells, immunotherapy may still be a prescribed and potentially effective, treatment for you. This treatment decision is made by your doctor and is often dependent on your type and stage of lung cancer, previous treatment outcomes or disease progression.

How is immunotherapy given?

Immunotherapy is given in an outpatient oncology clinic.

Checkpoint inhibitor immunotherapy for lung cancer is given via an intravenous (IV) infusion directly into a vein in your arm or via a central line (portacath or PICC). These treatments are usually prescribed every two, three or four weeks, in a repeating cycle. A cycle is the administration of treatment followed by a period of rest. The rest period gives your body a chance to recover, respond to the immunotherapy and build new, healthy cells. Checkpoint inhibitors can be given on their own (as a single infusion) or in combination with another therapy.

How will I know if immunotherapy is working?

Whilst having immunotherapy treatment you will be reviewed by your oncologist with each treatment, as well as having blood tests and scans to monitor and assess your response to the treatment.

Cancer response to immunotherapy is different for everybody. For some, the cancer may shrink. For others, the cancer remains stable, meaning the cancer does not increase or decrease in size. People with stable disease can continue to have a good quality of life, while continuing on treatment.

Unfortunately, immunotherapy does not work for everyone and for some people, their lung cancer may not respond to immunotherapy treatment. Whilst this can be disheartening, there are other cancer treatment options which can be explored with your oncologist, including chemotherapy, targeted therapy, radiation or participation in a clinical trial.

To find out more, read our fact sheet **Immunotherapy and side effects.**

^[1] Cancer Council (2019) Understanding Immunotherapy: A guide for people affected by cancer. <https://www.cancer.org.au/cancer-information/treatment/immunotherapy>

^[2] National Cancer Institute (2019) Immune checkpoint inhibitors. <https://www.cancer.gov/about-cancer/treatment/types/immunotherapy/checkpoint-inhibitors>



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- Peer-to-peer connections
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