

ALK+ Lung Cancer

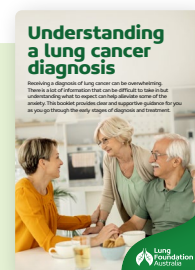


Important terms

ALK	Stands for Anaplastic Lymphoma Kinase.
ALK gene	a gene in our dna that gives instructions to cells to grow or stop growing.
Gene fusion	a genetic error that happens when one gene breaks and then joins (fuses) to another gene.
Abnormal ALK protein	a protein made by the ALK gene fusion that fuels the growth of cancer cells.
Tyrosine Kinase Inhibitor (or TKI)	a type of targeted medicine that blocks the abnormal ALK protein and stops it sending growth signals to cancer cells.



It is important to know if you have an ALK+ lung cancer because it allows you access to different types of treatments. This factsheet will describe what ALK is, how it relates to lung cancer and how it affects your treatment options. It should be read along with our **Understanding a Lung Cancer diagnosis booklet**.
Please click here to download booklet [🔗](#)



ALK gene explained

The ALK gene helps our nervous system and other parts of our body develop before we are born. It switches off soon after birth and remains off. However, the gene remains in our DNA for our whole life.



ALK and lung cancer

Sometimes a genetic error occurs when the ALK gene is broken and reattaches to another gene. When this happens the:

- ALK gene can be switched back on and locked in an active state.
- The activated gene produces an abnormal ALK protein.
- The abnormal ALK protein helps cancer cells grow, multiply, and form a tumour.

When lung cancer cells show the ALK gene fused to another gene, it is an ALK positive (ALK+) lung cancer. ALK+ lung cancers are a subtype of non-small cell lung cancer (NSCLC). It is most common in adenocarcinoma and squamous cell types of NSCLC.



Biomarker

You might also hear ALK called a **biomarker**. This means it is a marker found on or inside cancer cells that helps doctors identify specific cancers. Some treatments work by targeting these biomarkers to stop or slow the cancer from growing.



What are gene fusions in cancer cells?

A gene fusion is a change in the DNA sequence inside cancer cells. It happens when the gene is broken or does not form properly and then joins to another gene creating a faulty gene fusion.

These changes happen for many reasons including prolonged exposure to harmful substances like

- radon
- asbestos
- heavy chemicals
- tobacco smoke (through smoking or being around others when they smoke).

Some genetic errors are inherited – passed down from parent to child. However, the gene fusion in ALK+ lung cancers are usually not inherited.



Who is at risk of getting ALK+ lung cancer

We do not know what causes the gene fusion error that leads to ALK+ lung cancer. However, exposure to the substances listed above may increase your risk. ALK+ lung cancer often affects younger adults with an average age of 52 years at diagnosis. However, younger and older adults may still be diagnosed.

While exposure to tobacco smoke is a risk factor, many people diagnosed with this type of cancer have never smoked or have only smoked a small amount.



How do I know if I have ALK+ lung cancer?

Your doctor will do a biopsy if they think you have lung cancer. In this procedure, the doctor removes a small sample of the tumour and sends it to a laboratory. A scientist will then do several tests on the sample to help work out what type of cancer you have. This is called a **tissue biopsy** and is the main biopsy you will have to diagnose lung cancer.

You may also have a blood test or sample of some other fluid in your body to test for cancer cell fragments. This test is a **liquid biopsy**. Liquid biopsies are not as accurate as tissue biopsies but may be used if a tissue biopsy is not possible.

To determine if lung cancer is ALK+ the scientist does extra tests. "Molecular profiling" or "genomic testing" is done using tissue from your biopsy. Molecular profiling are special tests that look at changes in the DNA sequence of genes. In addition to ALK mutations, these tests will also look for other mutations or genetic changes that may result in lung cancer. Other names for genetic tests are **Fluorescence In-Situ Hybridisation (FISH)** and **Next Generation Sequencing (NGS)**.



A treatment target

Understanding how ALK promotes cancer growth helped researchers develop new ways to treat ALK+ lung cancer. They found that when the ALK protein is blocked, it switches off. By blocking the abnormal ALK protein, growth and survival signals that keep the cancer cell alive are also blocked. This can then slow or stop the growth of cancer cells.

Medicines used to block ALK are a type of targeted therapy called Tyrosine Kinase Inhibitors (or TKIs). TKIs are taken long-term as tablets or capsules.



Treatments for ALK+ Lung Cancer

Treatment may be a combination of chemotherapy, targeted therapy – such as a TKI, radiation therapy, or surgery – or just one of these.

The best treatment for you will depend on several factors including your:

- Stage and type of lung cancer
- Other treatments you've had
- Other health conditions
- Age and overall wellness
- Your personal preferences.



Early stage

Early-stage ALK+ lung cancers may only need surgery and/or radiation. Depending on your individual risk factors, you may also be offered a TKI to take after surgery.

TKIs that target ALK fusions have become the standard treatment for people with an ALK+ lung cancer. Examples of these medicines include:

Generic name	Brand name
Lorlatinib	Lorviqua
Alectinib	Alecensa
Brigatinib	Alunbrig
Ceritinib	Zykadia
Crizotinib	Xalkori



Notice the generic names all end in **nib**. This is a way to recognise medicine as being a Tyrosine Kinase Inhibitor.



Locally advanced or advanced

ALK+ lung cancer that has spread outside the lungs to lymph nodes or other organs is usually treated with medicine. This may include a TKI on its own (see list above), or other treatments such as chemotherapy. Ask your oncologist to explain the best treatment options for you based on your individual situation.



Clinical trials

You may be offered a clinical trial. Clinical trials are research studies that test new treatments to see if they are safe and work well before they become standard treatment. Ask your doctor about clinical trials if you are interested. For more information, please see page 38 of our **Understanding a lung cancer diagnosis booklet**. [↗](#)



Side-effects

Every medicine has the potential to cause unwanted side-effects. Ask your doctor what side-effects to expect and how to manage them at home. For more information on possible side-effects with targeted therapy such as Tyrosine Kinase Inhibitors (TKIs) please visit the **Cancer Council** [↗](#) website.



Questions to ask your doctor

What type and stage of lung cancer do I have?

Does my lung cancer have any mutations or targetable biomarkers?

How do these change my treatment options?

What side-effects should I expect?

What are the most serious side-effects of this treatment?

How can I manage these at home?

When do I need to seek medical advice, and who do I contact after hours?



Summary

ALK+ lung cancer occurs when the ALK gene fuses with another gene and is mistakenly switched on. This gene fusion produces an abnormal ALK protein that turns healthy lung cells into cancerous cells. These cells grow and multiply causing a tumour.

Tyrosine Kinase Inhibitors (TKIs) that block ALK effectively switch the ALK gene off, which stops or slows the growth of cancer cells.



Resources

- **Understanding a lung cancer diagnosis booklet**. [↗](#)
- **Questions to ask your healthcare team - Lung Foundation Australia** [↗](#)
- ALK Positive Australia www.alkpositive.org.au [↗](#)
- Facebook groups:
 - Lung Cancer Awareness Support in Australia
 - ALK and ROS1Cancer – Australia and New Zealand



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