CONDITION

Stage 4 lung cancer

Stage 4 lung cancer is cancer that has spread beyond its original lung to distant areas of the body.

WHAT IT IS
Lung cancer that has spread beyond its original lung

BODY SYSTEM
Lungs and respiratory system

MAIN SYMPTOMS
Persistent cough, breathlessness, chest pain, weight loss

WHAT CAUSES IT
DNA changes in lung cells, often linked to smoking

HOW IT IS DIAGNOSED
Biopsy, imaging scans, and laboratory testing

MAIN TREATMENT
Systemic cancer treatment, radiotherapy, and supportive care

CAN IT BE CURED?
No - usually treated to control it

IS IT AN EMERGENCY?
Sometimes - severe breathlessness or coughing blood

LONG-TERM OUTLOOK
Serious condition with an individual and often uncertain course

Overview

Stage 4 lung cancer means cancer that began in a lung has spread beyond its original location. It may have reached the other lung, the lining around the lungs or heart, or distant organs such as the brain, liver, bones, or adrenal glands.

Doctors may also call it advanced or metastatic lung cancer. "Metastatic" means that cancer cells have travelled to another part of the body. For example, lung cancer in a bone is still lung cancer, not bone cancer.

There are two main types of lung cancer. Non-small cell lung cancer is the more common group. Small cell lung cancer tends to grow and spread more quickly. Small cell lung cancer is often described as limited-stage or extensive-stage, although the numbered staging system can also be used.

Stage 4 is a serious condition. Treatment usually cannot remove every cancer cell permanently, but it may shrink or slow the cancer, ease symptoms, and help some people live longer. Treatment options have expanded, especially for cancers with certain gene changes or features that make immunotherapy more likely to work.

ALK is not another name for stage 4 lung cancer. It is a gene involved in cell growth. A rearrangement in this gene can drive some non-small cell lung cancers. If a tumour is ALK-positive, targeted medicines may be an important treatment option.

Symptoms

Symptoms differ according to where the cancer is growing. Some people have several symptoms, while others have few when the cancer is found.

Symptoms affecting the chest can include:

Whole-body effects can include tiredness, reduced appetite, and weight loss that was not intended. These symptoms may come from the cancer, inflammation caused by it, or the body using energy differently.

Cancer that has spread elsewhere can cause symptoms linked to that area. Bone involvement may cause ongoing pain or make a bone easier to break. Brain involvement may cause headaches, weakness, seizures, confusion, or changes in balance or vision. Liver involvement may cause discomfort on the right side of the abdomen, swelling, or yellow skin and eyes.

These symptoms have many possible causes and do not confirm lung cancer. New or changing symptoms still deserve medical assessment, particularly if they persist.

- A cough that does not go away or changes
- Breathlessness, wheezing, or repeated chest infections
- Chest, shoulder, or back pain
- Coughing up blood
- A hoarse voice

Causes and risk factors

Stage 4 lung cancer develops when abnormal lung cells grow without normal control and acquire changes that let them spread. The immediate cause is damage or alteration in the cells' DNA. It is not always possible to identify why this happened in one person.

Smoking tobacco is the leading preventable risk factor for lung cancer. Risk generally rises with the amount and duration of exposure, but people who have never smoked can also develop the condition. This is particularly relevant to some cancers driven by gene changes such as ALK, EGFR, or ROS1 alterations.

Other recognised risk factors include long-term exposure to secondhand smoke, radon gas, asbestos, diesel exhaust, and certain workplace substances. Previous radiation treatment to the chest and a family history of lung cancer may also affect risk.

The gene changes found inside a tumour are usually acquired during life. An ALK rearrangement in lung cancer, for example, is generally limited to the cancer cells and is not an inherited ALK condition.

Nothing you did caused the cancer to become stage 4 at a particular moment. Lung cancer can spread before it produces clear symptoms.

Diagnosis

Diagnosis normally begins with imaging. A chest X-ray may find an abnormal area, but a CT scan provides more detail. PET-CT, brain MRI, bone imaging, or other scans may be used to see whether the cancer has spread.

A biopsy is usually needed to confirm the diagnosis. During a biopsy, a small sample of tissue or cells is removed. It may be collected with a needle through the chest, during a camera examination of the airways called bronchoscopy, from fluid around the lung, or from a site where the cancer has spread.

A pathologist examines the sample to identify the cancer type. For advanced non-small cell lung cancer, laboratory testing can look for tumour features that may guide treatment. These can include:

A blood test called a liquid biopsy can sometimes detect tumour DNA circulating in the blood. It may provide useful results when tissue is difficult to obtain, but a negative blood result does not rule out a treatable gene change.

Staging combines the biopsy and scan findings. Your general health, symptoms, lung function, and ability to manage everyday activities also help shape treatment choices.

- Gene changes such as ALK, EGFR, ROS1, BRAF, KRAS, RET, MET, or NTRK alterations
- PD-L1, a protein that may help predict whether immunotherapy could work
- Broader molecular testing that checks many cancer-related genes together

Treatment and management

Treatment is planned around the type of lung cancer, its molecular test results, where it has spread, your health, and what matters to you. It often involves more than one approach.

Systemic treatment travels through the bloodstream and can reach cancer in several areas. Options include chemotherapy, immunotherapy, targeted therapy, or combinations of these.

Targeted therapy blocks a specific feature that cancer cells use to grow. For example, ALK-positive non-small cell lung cancer may be treated with an ALK-targeted medicine. These treatments can sometimes control cancer for substantial periods, but resistance may eventually develop. A later biopsy or blood test may help identify another treatment option.

Immunotherapy helps the immune system recognise or attack cancer cells. Whether it is suitable is influenced by the cancer type, molecular findings, PD-L1 result, previous treatment, and overall health. It can cause the immune system to inflame healthy organs, so new symptoms need prompt reporting.

Chemotherapy damages rapidly dividing cells. It may shrink cancer, relieve symptoms, and slow progression. Side effects depend on the medicines used and may include tiredness, nausea, infection risk, mouth soreness, or changes in blood counts. Supportive medicines and treatment adjustments can help manage these effects.

Radiotherapy uses focused high-energy radiation. It may treat painful bone areas, bleeding, airway blockage, or cancer in the brain. In selected people with only a small number of metastatic areas, focused treatment to those sites may be considered alongside systemic therapy.

Supportive and palliative care address symptoms and quality of life at any stage. This care can be given while cancer treatment continues. It may help with pain, breathlessness, coughing, sleep, appetite, emotional distress, and practical planning. Palliative care does not mean that other treatment has stopped.

Complications

Stage 4 lung cancer can affect breathing or the function of organs where it has spread. Possible complications include fluid around a lung, airway narrowing, pneumonia, blood clots, or bleeding from the airways.

Cancer in bone can cause severe pain, high calcium levels, or fractures. Cancer involving the spine can press on the spinal cord. Brain metastases can cause swelling, seizures, weakness, or changes in thinking and behaviour.

Treatment can also cause complications. Chemotherapy may lower infection-fighting blood cells. Immunotherapy can inflame organs such as the lungs, bowel, liver, thyroid, or heart. Targeted treatment has medicine-specific effects, which may include diarrhoea, liver changes, swelling, heart effects, or lung inflammation.

Report new symptoms rather than assuming they are an expected part of cancer or treatment. Many complications are more manageable when recognised early.

Prevention

Stage 4 lung cancer cannot always be prevented. Some people develop it without a known avoidable exposure, and there is no proven way to prevent an acquired tumour change such as an ALK rearrangement.

Not smoking lowers the risk of developing lung cancer. Stopping smoking after diagnosis may also improve breathing, treatment tolerance, and healing. Support is available if stopping feels difficult.

Reducing exposure to secondhand smoke, testing a home for radon where this is recommended locally, and following workplace protection rules may reduce risk. These steps cannot guarantee prevention.

Screening with low-dose CT can find some lung cancers earlier in people at high risk, before symptoms develop. Eligibility is based mainly on age and smoking history and differs by country. Screening is not used to monitor symptoms that have already appeared.

Living with it and what to expect

Stage 4 lung cancer usually needs long-term monitoring and repeated treatment decisions. Scans and appointments assess whether treatment is shrinking the cancer, keeping it stable, or no longer controlling it. Blood tests may check organ function and treatment effects.

Some people have a strong and lasting response to targeted therapy or immunotherapy. Others have cancer that progresses more quickly or cannot tolerate certain treatments. Statistics describe groups and cannot predict exactly what will happen to one person.

Over months or years, treatment may continue, pause, or change. A change does not always mean that all options have been exhausted. Another medicine, radiotherapy, a clinical trial, or a greater focus on symptom relief may be appropriate.

Daily life can include periods of treatment, recovery, and relative stability. Fatigue and

breathlessness may affect work, exercise, driving, caring responsibilities, or social plans. Rehabilitation, gentle activity within your ability, nutrition support, and help with anxiety or sleep can make daily life more manageable.

It can be useful to discuss future care before a crisis. Advance care planning records your priorities if you later become too unwell to explain them. This can sit alongside active cancer treatment and can be changed as your wishes change.

When to get medical help

Contact your cancer team promptly about a new or worsening symptom, including increasing cough, pain, breathlessness, fever, poor fluid intake, repeated vomiting, diarrhoea, rash, unusual tiredness, or yellowing of the skin or eyes. If you are receiving treatment, use the contact instructions provided by your team rather than waiting for the next routine appointment.

Seek emergency help for:

Routine follow-up is the right place to discuss stable symptoms, scan results, treatment choices, side effects that are already controlled, and support with daily activities.

- Severe or rapidly worsening difficulty breathing
- Coughing up more than small streaks of blood
- New one-sided weakness, facial drooping, confusion, or trouble speaking
- A first seizure or a seizure lasting longer than instructed
- Sudden severe chest pain, collapse, or loss of consciousness
- New leg weakness, numbness around the groin, or loss of bladder control
- Fever with shaking, confusion, or severe illness during cancer treatment

Common questions

How long can you live with stage 4 lung cancer?

There is no reliable single answer. Survival is influenced by the cancer type, gene changes, spread pattern, response to treatment, general health, and available therapies. Group averages cannot tell you how long an individual person will live.

Can stage 4 lung cancer go into remission?

Yes. Remission means that signs of cancer have reduced or disappeared on available tests. A

complete response can occur, but it does not always mean the cancer has been permanently cured. Ongoing scans are usually needed.

What does ALK-positive lung cancer mean?

It means the cancer contains a rearrangement involving the ALK gene, which is helping the cells grow. It is most often found in non-small cell lung cancer. ALK-targeted medicines can block this signal.

Can someone with stage 4 lung cancer still feel well?

Yes. Some people have few symptoms at diagnosis or feel better after treatment begins. Feeling well does not show whether the cancer is active, so scheduled scans and follow-up remain important.

Is palliative care the same as end-of-life care?

No. Palliative care treats symptoms and supports quality of life from diagnosis onward. End-of-life care is one part of palliative care and is used when someone is approaching the end of life.

Does stage 4 always mean treatment should stop?

No. Stage 4 describes how far the cancer has spread, not whether treatment is worthwhile. Treatment may aim to control the cancer, ease symptoms, and extend life. Its benefits and burdens should be reviewed over time.

Sources

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