Choosing surgery or radiation therapy as a treatment for stage I lung cancer

Surgery and radiation therapy are both used as treatments for stage I lung cancer.
If you have stage I lung cancer, you can use this guide to:

- Learn more about surgery and radiation therapy
- Help you make a decision about treatment
- Talk with your doctor about your treatment options

About stage I lung cancer

Stage I lung cancer is when the cancer is small and has not spread outside of the lung.

When doctors find lung cancer early, before it has spread to other parts of the body, it has a much better chance of being treated successfully. Thanks to new ways to screen (checking for lung cancer before you have symptoms), doctors can find more lung cancers at an early stage today than in the past.

About 80 out of 100 (80%) of people with stage I lung cancer do not have their cancer come back in their body after treatment with surgery or radiation therapy.

Choosing between surgery and radiation therapy

Every person with cancer is different. For some people, surgery is the best choice. For other people, radiation therapy is the best choice. Or, either treatment can be a good choice.

Talk to your health care team about which choice might work best for you. They can help you decide based on:

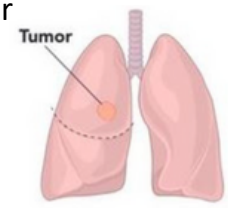
- What they know about your cancer
- Your other health issues
- How you feel about the pros and cons of each treatment

You may need to see a surgeon and radiation oncologist (a doctor with special training treating cancer with radiation therapy) to find out which of these treatment options might work for you.

Learn about surgery

How does surgery work?

The goal of surgery is to take the cancer out of your body. In surgery for stage I lung cancer, doctors remove part of the lung and the cancer with it.



Lobectomy

Segmentectomy

Wedge Resection

What are the types of surgeries?

Lung cancer surgery can involve taking out different parts of the lung:

- **Lobectomy:** takes out a **lobe**, a large section of the lung. The right lung has 3 lobes, and the left lung has 2 lobes.
- **Segmentectomy:** takes out a **segment**, a part of a lobe. This surgery removes less of the lung than a lobectomy, but more than a wedge resection.
- **Wedge resection:** takes out a **piece** or **wedge**, which is a small part of lung. In a wedge resection, the surgeon removes the cancer and a small amount of healthy tissue around it.

The type of surgery you get depends on the size of the cancer and where it is in your lung.

What happens during surgery?

There are 2 ways doctors can do surgery. Your surgeon will talk with you about which way will work best for you:

- **Open surgery:** a large cut in your skin is made to get to the cancer.
- **Minimally invasive surgery:** surgery that uses tools, cameras, and lights to be able to work with several tiny cuts in your skin.

You will also have a lymph node biopsy during your surgery. This is when your doctor takes out one or more lymph nodes to see if there are cancer cells in it. The goal of a lymph node biopsy is to see if the cancer has spread.

Surgery usually takes about 1 to 3 hours. You will stay overnight in the hospital for a few days to recover.

After your surgery, you will need to see your surgeon for follow-up visits:

- Every 6 months for the first 2 years.
- Then, once a year for the next 3 years, to check if the cancer has come back or not.

What are the pros (benefits) of surgery?

Many people like knowing that the tumor has been taken out.

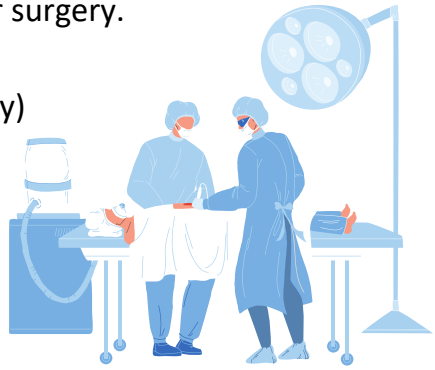
Surgery can also give your doctors more information about your cancer because they are able to look at the tumor after they take it out. With surgery, doctors can:

- **Check the edges (margins) of the tumor.** This lets doctors know if they have removed the whole tumor.
- **Check your lymph nodes.** With a lymph node biopsy, doctors can check if the cancer has spread to your lymph nodes.
- **Send a sample of the tumor to a lab.** A lab can look closely at the cancer cells to learn more about your cancer and give it an accurate cancer stage.
    - Sometimes, doctors think a cancer is stage I (only in the lungs) but find out during surgery that it might have started to spread.
    - If that happens to you, your health care team might suggest other treatments after your surgery like chemotherapy, immunotherapy, and/or radiation.

What are the cons (drawbacks) of surgery?

You will need to take time to **recover** from surgery:

- It takes people about 2-6 weeks to get back to regular activities after surgery.
- Your recovery time may depend on:
    - How the surgery will be done (minimally invasive or open surgery)
    - How much of your lung will be removed



There are possible **side effects** after surgery:

- About 5-10% feel pain weeks, months, or years after surgery.
- People sometimes feel short of breath for a long time.

There is a chance of **complications** (something going wrong) because of the surgery:

- About 5-10% have serious complications, such as:
    - Pneumonia
    - Bleeding
    - Blood clots
- There is a small chance of dying from surgery. About 1 out of 100 (1%) of people die from surgery.
- Some people have a higher risk (chance) of complications. **Talk to your doctor about how your health might raise your chance of complications.**

Learn about radiation therapy

How does radiation therapy work?

Radiation therapy uses high-energy beams (like X-rays) to destroy cancer cells, or damage their DNA so they can no longer grow and make more of themselves.

What happens during radiation therapy?

During radiation therapy, you will lie still while a machine delivers radiation to your body. Your treatment team can see you on a screen and talk to you through a speaker while you get radiation therapy.

Radiation is aimed precisely at the tumor so it affects the surrounding healthy tissue as little as possible. You will not feel pain or lose your hair from the radiation. The radiation does not stay in your body after each session is over. You are safe to be around others after each session is over.

Radiation therapy is done in **sessions** over a period of time. Each session is about 30 minutes long. Your doctor will tell you how many sessions you will need to complete your treatment.

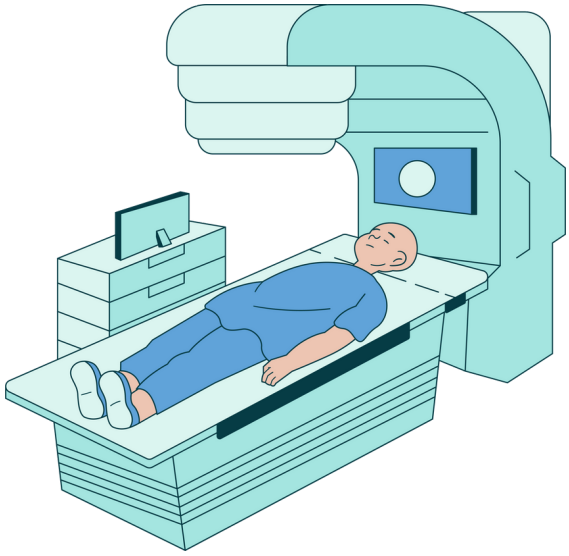
If you have stage I lung cancer, you will have:

- Most likely, 3 to 5 sessions given over 1 to 2 weeks.
- Some people have as few as 1 session or as many as 12 sessions.

After radiation therapy, you will need to see your radiation oncologist for follow-up visits:

- Every 3 months for the first 2 years.
- Then every 6 months to 1 year for the next 3 years, to check if the cancer has come back or not.

Radiation therapy makes a scar in your lung. It will need to be checked by your doctor in follow-up visits.



What are the pros (benefits) of radiation therapy?

It is **simpler** than surgery:

- You will not need to stay overnight in the hospital.
- You will not need any anesthesia or blood draws.

It is **easier to recover** from than surgery:

- You can keep doing all of your regular activities, even if you feel tired.

There is a **lower chance of complications** than surgery:

- Radiation can be done in most people, even if they have other health problems.
- The chance of serious complications is very low.

What are the cons (drawbacks) of radiation therapy?

There are possible **side effects** after radiation therapy:

- A few months after their treatment, about 5% of people have lung discomfort for a short time. This can be treated with steroids.
- After 9 months to 1 year after their treatment, about 10% have chest pain for a short time.
- People sometimes feel short of breath for a long time.

How do I choose a treatment, if both are good options for me?

Comparing surgery and radiation therapy

Common concerns and questions	Surgery	Radiation therapy
How it works to treat the cancer cells in your body	Takes the cancer cells out of your lung.	Kills the cells with radiation therapy.
The chance of cancer coming back after treatment	Slightly lower chance of the cancer coming back. Doctors will keep checking for this with scans.	Slightly higher chance of the cancer coming back. Doctors will keep checking for this with frequent scans.
Hospital stay	You will have to stay a few nights in the hospital.	You will **not** have to stay overnight in the hospital.
Recovery	It takes people about 2-6 weeks to get back to regular activities after surgery.	You can keep doing your regular activities, even if you feel tired.
Chance of serious complications such as bleeding, pneumonia, lung damage, or life-threatening issues	About 5-10% of people have serious complications from surgery. Some people with other health problems should not have lung surgery.	Very few people (<1%) have serious complications from radiation therapy. It can be done in most people.
Follow-up scans needed (such as CT scans) to see if the cancer has come back or spread	You will have scans every 6 months for the first 2 years, then once a year for the next 3 years.	Scans will be more frequent. You will have scans every 3 months for the first 2 years, then every 6 months to 1 year for the next 3 years.
Accuracy of staging	You may get a more accurate stage because doctors can look at your lymph nodes to see if your cancer has spread and send a sample of the tumor to a lab.	There is a chance that doctors may miss cancer that has spread to other parts of your body, leading to a less accurate stage.

How to decide

Making a choice between two treatment options can be hard. Please use this guide as a starting point and talk to your health care team about your questions and concerns. They can answer questions and give you resources to help.

As you think about the best choice for you, it is important to **consider**:

1. What are my overall goals for my cancer care?
2. What worries me about this choice?
    - My overall health
    - Regular activities that are hard to skip while I recover (such as work or childcare)
    - Finding support from others while I recover
    - Be able to get to and from my treatment and follow-up scans
    - Something else: _____
3. Is there someone else I want to talk to about my treatment plan?

Where can I go to learn more?

Scan the QR codes with your phone to visit websites where you can learn more.

NCCN guidelines for patients:
nccn.org/patients/guidelines/content/PDF/lung-early-stage-patient.pdf

More about types of lung cancer:
rtanswers.org/cancer-types/lung-cancer

More about radiation therapy:
rtanswers.org/how-does-radiation-therapy-work/stereotactic-radiation-therapy

Who made this guide?

People who helped with the clinical review:

- Benjamin Kozower, MD, MPH
- Pamela Samson, MD, MPHS
- Kathryn E Engelhardt, MD MS
- Clifford Robinson, MD
- Varun Puri, MD, MSCI

People who helped with the editorial review:

- Mary C. Politi, PhD
- Ashely Housten, OTD, MSCI

Updated September 2023