Learn about minimally invasive da Vinci Surgery.

Facing Surgery for Lung Cancer?
The Condition: Lung Cancer

Your lungs are spongy, air-filled organs that move oxygen through your body. You have two lungs - one on each side of your heart.

Lung cancer is a disease that attacks the lung tissue. It usually develops in adults older than age 65.\(^1\) It is the most common cancer worldwide, with 1.2 million new cases every year.\(^2\)

Tobacco smoke is the leading cause of lung cancer. Smoking cigarettes, pipes, cigars or being exposed to secondhand smoke can increase your risk for this disease.\(^2\)

Of the two main types of lung cancer, non-small cell is the most common. Fortunately, it is also the slower growing of the cancers.\(^3\)

In the early stages, lung cancer may not cause any symptoms but may be found during a routine X-ray. If symptoms are present, they may include a chronic cough, trouble breathing, chest pain and unexplained weight loss.\(^3\)
After your doctor makes a diagnosis and determines the stage (extent) of the cancer, he/she will suggest a treatment plan. Treatment and surgical options for the most common lung cancer, non-small cell lung cancer, can vary. Patients may have surgery, chemotherapy, radiation therapy or a combination of treatments.

Radiation uses high-energy X-rays to kill cancer cells. External radiation is the most common type of radiation for lung cancer. Side effects depend on the dose and type of radiation. While it is non-invasive, this treatment may harm your esophagus and ability to swallow.

Chemotherapy uses anti-cancer drugs to kill cancer cells. These drugs can be given through a vein or taken by mouth. Your doctor will discuss the side effects of chemotherapy with you, as well as the pros and cons of all treatments and surgical options.

During lung cancer surgery, your surgeon will remove: a small section of your lung with the tumor and a
margin of healthy tissue (wedge resection); a larger portion of the lung, but not an entire lobe (segmental resection); an entire lobe of one lung (lobectomy); or an entire lung (pneumonectomy). The amount of tissue/lung removed will depend on the stage of the cancer.

Lung cancer surgery is often performed using open surgery through a long chest incision. Your surgeon may also need to spread your ribs to access your lung. Open surgery allows doctors to see and touch your organs while operating.

An alternative to open surgery is thoracoscopy (also called video-assisted thoracic surgery or VATS). Doctors insert a tiny camera (thorascop) and surgical instruments into your chest through small incisions. The camera takes images inside your body and sends them to a video monitor in the operating room to guide doctors as they operate.

A minimally invasive option for lung cancer patients facing lobectomy is da Vinci Surgery.
*da Vinci Surgery:*
A Minimally Invasive Surgical Option

Using the *da Vinci* System, surgeons make a few small incisions - similar to thoracoscopy procedures. The *da Vinci* System features a magnified 3D high-definition vision system and tiny wristed instruments that bend and rotate far greater than the human wrist. These unique features enable surgeons to operate with enhanced vision, precision, dexterity and control.

As a result of *da Vinci* technology, *da Vinci* Lobectomy offers precise removal of cancerous tissue, as well as the following potential benefits compared to open surgery:

- Lower rate of complications
- Less blood loss
- Shorter hospital stay
- Less pain
- Fewer days with chest tube (used to drain excess lung fluid)
- Improved mental quality of life soon after surgery
- Small incisions for minimal scarring

*Risks & Considerations Related to Lobectomy & da Vinci Surgery:*
Potential risks of any lobectomy procedure, including *da Vinci* Lobectomy, include:

- Abnormal heartbeat following surgery
- Bronchopleural fistula (abnormal passageway develops between lung airways and the membranes that line the lungs)
- Blood loss requiring transfusion

*Important Information for Patients:*
All surgery presents risk, including *da Vinci* Surgery. Results, including cosmetic results, may vary. Serious
Complications may occur in any surgery, up to and including death. Examples of serious and life-threatening complications, which may require hospitalization, include injury to tissues or organs; bleeding; infection; and internal scarring that can cause long-lasting dysfunction or pain. Temporary pain or nerve injury has been linked to the inverted position often used during abdominal and pelvic surgery. Patients should understand that risks of surgery include potential for human error and potential for equipment failure. Risks specific to minimally invasive surgery may include: a longer operative time; the need to convert the procedure to other surgical techniques; the need for additional or larger incision sites; a longer operation or longer time under anesthesia than your surgeon originally predicts. Converting the procedure to open could mean a longer operative time, long time under anesthesia, and could lead to increased complications. Research suggests that there may be an increased risk of incision-site hernia with single-incision surgery. Patients who bleed easily, have abnormal blood clotting, are pregnant or morbidly obese are typically not candidates for minimally invasive surgery, including da Vinci Surgery. Other surgical approaches are available. Patients should review the risks associated with all surgical approaches. They should talk to their doctors about their surgical experience and to decide if da Vinci is right for them. For more complete information on surgical risks, safety and indications for use, please refer to http://www.davincisurgery.com/safety.
The friable nature of pulmonary tissue enhances the risk of vascular, bronchiolar, or other injury that will be difficult to control when using this device. Published clinical experience, as well as clinical studies performed to support this marketing clearance have demonstrated that even surgeons considered expert in laparoscopy/thoracoscopy have substantial learning curves of 10 to 12 cases.

The Enabling Technology:  
*da Vinci* Surgical System

The *da Vinci* Surgical System is designed to provide surgeons with enhanced capabilities, including high-definition 3D vision and a magnified view. Your doctor controls the *da Vinci* System, which translates his or her hand movements into smaller, more precise movements of tiny instruments inside your body.

Though it is often called a “robot,” *da Vinci* cannot act on its own. Surgery is performed entirely by your doctor. Together, *da Vinci* technology allows your doctor to perform routine and complex procedures through just a few small openings, similar to traditional laparoscopy.

The *da Vinci* System has been used successfully worldwide in approximately 1.5 million various surgical procedures to date. *da Vinci* - changing the experience of surgery for people around the world.