

Groin Hernia

Inguinal and Femoral Repair



AMERICAN COLLEGE OF SURGEONS
*Inspiring Quality:
 Highest Standards, Better Outcomes*

Patient Education

This educational information is to help you be better informed about your operation and empower you with the skills and knowledge needed to actively participate in your care.

Keeping You Informed

Information that will help you further understand the operation and your role in your recovery.

Education is provided on:

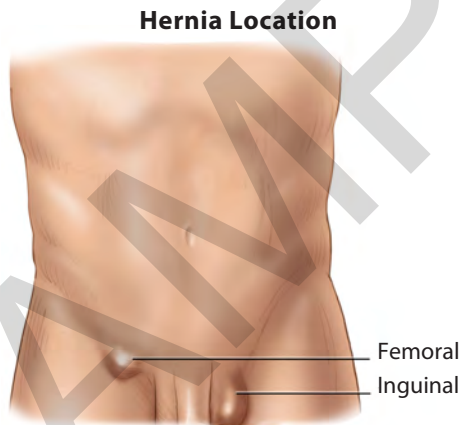
- Hernia Repair Overview 1
- Condition, Symptoms, Tests 2
- Treatment Options 3
- Risks and Possible Complications 4
- Preparation and Expectations 5
- Your Recovery and Discharge 6
- Pain Control 7
- Glossary/References 8

The Condition

A hernia occurs when tissue bulges out through an opening in the muscles. Any part of the abdominal wall can weaken and develop a hernia, but the most common sites are the groin (inguinal), the navel (umbilical) and a previous surgical incision site.

Common Symptoms

- Visible bulge in the scrotum or groin area, especially with coughing or straining
- Pain or pressure at the hernia site



Treatment Options

Surgical Procedure

Open hernia repair—An incision is made near the site and the hernia is repaired with mesh or by suturing (sewing) the muscle closed.

Laparoscopic hernia repair—The hernia is repaired by mesh or sutures inserted through instruments placed into small incisions in the abdomen.

Nonsurgical Procedure

Watchful waiting is a safe and acceptable option for adults with inguinal hernias that are not uncomfortable.^{1,2} Many

patients become symptomatic after the first 1 to 2 years and crossover to surgery due to increased pain on exertion, chronic constipation or urinary symptoms.³

Benefits and Risks of Your Operation

Benefits—An operation is the only way to repair a hernia. You can return to your normal activities and in most cases will not have further discomfort.

Possible risks include—Return of the hernia; infection; injury to the bladder, blood vessels, intestines or nerves, difficulty passing urine, continued pain, and swelling of the testes or groin area.

Risks of not having an operation—Your hernia may cause pain and increase in size. If your intestine becomes trapped in the hernia pouch you will have sudden pain, vomiting, and need an immediate operation.

Expectations

Before your operation—Evaluation may include blood work and urinalysis. Your surgeon and anesthesia provider will discuss your health history, home medications, and pain control options.

The day of your operation—You will not eat or drink for 6 hours before the operation. Most often you will take your normal medication with a sip of water. You will need someone to drive you home.

Your recovery—If you do not have complications you usually will go home the same day.

Call your surgeon—If you have severe pain, stomach cramping, chills, or a high fever (over 101°F or 38.3°C), odor or increased drainage from your incision, or no bowel movements for 3 days.

SURGICAL PATIENT EDUCATION PROGRAM
 Prepare for the Best Recovery

This first page is an overview. For more detailed information, review the entire document.

The Condition, Symptoms, and Diagnostic Tests

Keeping You Informed

Who Gets Hernias?

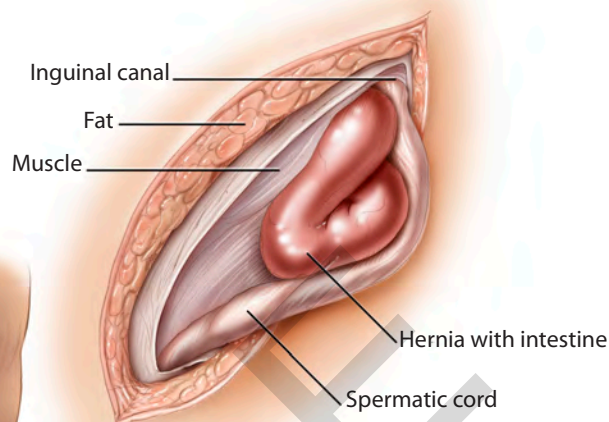
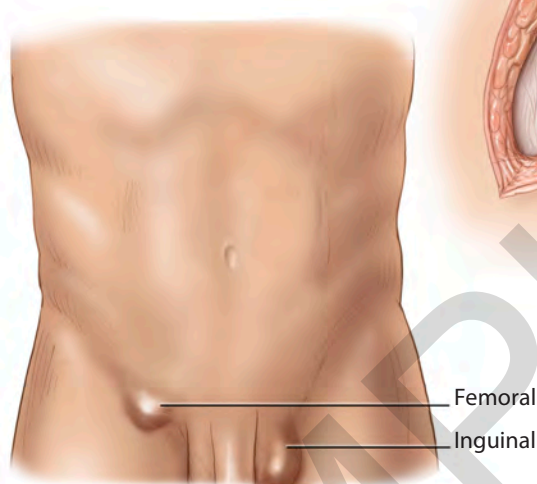
There may be no cause for a hernia. Some risk factors are:

- Older age—muscles become weaker
- Obesity—increased weight places pressure on abdominal muscle
- Sudden twist, pulls, or strains
- Chronic straining
- Family history
- Connective tissue disorders
- Pregnancy—1 in 2,000 women develop a hernia during pregnancy.²

Other medical disorders

that have symptoms similar to hernias include enlarged lymph nodes, cysts, and testicular problems such as scrotal hydrocele.²⁻⁴

Groin Hernia



The Condition

The Hernia

An **inguinal hernia** occurs when the intestine bulges through the opening in the muscle in the groin area. A **reducible hernia** can be pushed back into the opening. When intestine or abdominal tissue fills the hernia sac and cannot be pushed back, it is called **irreducible or incarcerated**. A hernia is **strangulated** if the intestine is trapped in the hernia pouch and the blood supply to the intestine is decreased. **This is a surgical emergency.**²

There are two types of **groin hernias**.

An **inguinal hernia** appears as a bulge in the groin or scrotum. Inguinal hernias account for 75% of all hernias and are most common in men.²

A **femoral hernia** appears as a bulge in the groin, upper thigh, or labia (skin folds surrounding the vaginal opening). Femoral hernias are ten times more common in women.² They are always repaired because of a high risk of strangulation.¹⁻³

Herniorraphy is the surgical repair of a hernia.

Hernioplasty is the surgical repair of a hernia with mesh.

Symptoms

The most common symptoms are:

- Bulge in the groin, scrotum, or abdominal area that often increases in size with coughing or straining.
- Mild pain or pressure at the hernia site.²
- Numbness or irritation due to pressure on the nerves around the hernia.²
- Sharp abdominal pain and vomiting can mean that the intestine has slipped through the hernia sac and is strangulated. **This is a surgical emergency and immediate treatment is needed.**

Common Tests

History and Physical exam²

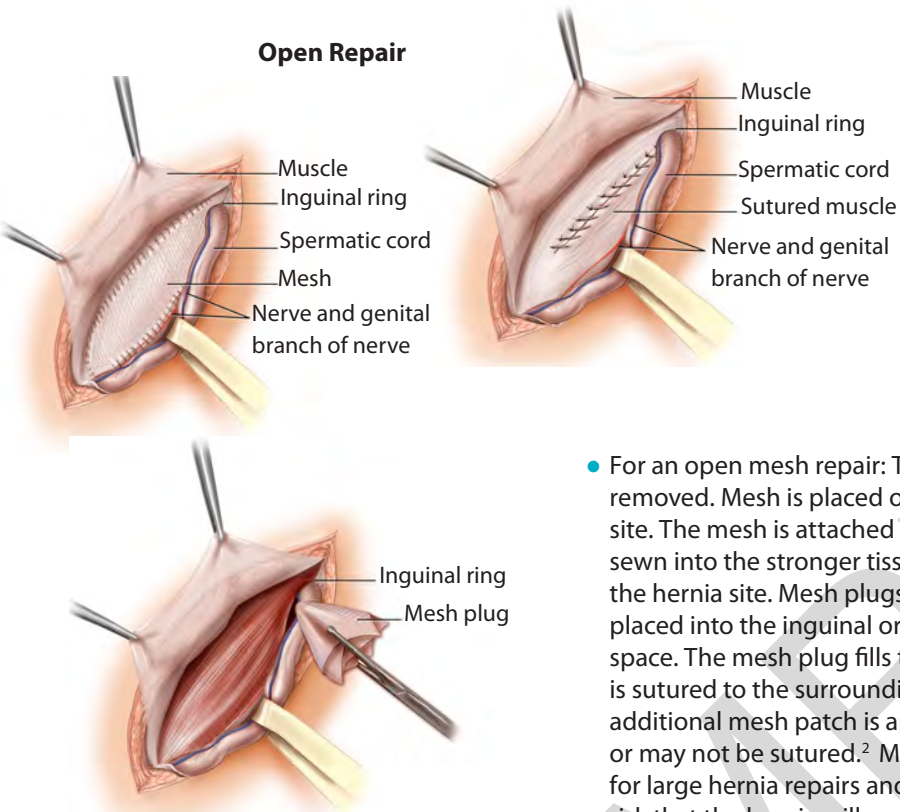
The site is checked for a bulge.

Other tests may include (**see glossary**):

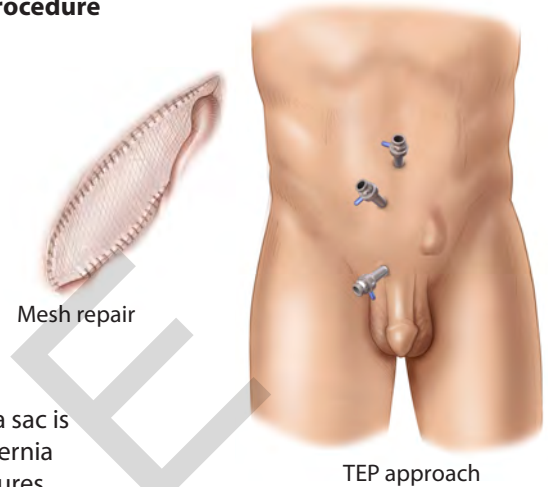
- Digital Exam
- Blood tests
- Urinalysis
- Electrocardiogram (ECG)—for patients over 45 or if high risk of heart problems
- Ultrasound
- Computerized tomography (CT) scan

Surgical and Nonsurgical Treatment

Open Repair



Port-sites Vary Depending On Procedure



- For an open mesh repair: The hernia sac is removed. Mesh is placed over the hernia site. The mesh is attached using sutures sewn into the stronger tissue surrounding the hernia site. Mesh plugs can also be placed into the inguinal or femoral hernia space. The mesh plug fills the open site and is sutured to the surrounding tissue. An additional mesh patch is applied and may or may not be sutured.² Mesh is often used for large hernia repairs and may reduce the risk that the hernia will come back. The site is closed using sutures, staples, or surgical glue.

Trusses or belts can help manage the symptoms of a hernia by applying pressure at the site. A truss requires correct fitting and complications include testicular nerve damage and incarceration may result.⁴

Surgical Treatment

The type of operation depends on hernia size and location, and if it is a repeat hernia. Your health, age, anesthesia risk, and the surgeon's expertise are also important. An operation is the only treatment for incarcerated/strangulated and femoral hernias.

Your hernia can be repaired either as an **open or laparoscopic approach**. The repair can be done by using sutures only or adding a piece of mesh.

Open Hernia Repair

The surgeon makes an incision near the hernia site and the bulging tissue is pushed back into the abdomen. Most inguinal hernia repairs use mesh to close the muscle.⁵ An open repair can be done with local anesthesia.

- For a suture-only repair: The hernia sac is removed. Then the tissue along the muscle edge is sewn together. This procedure is often used for strangulated or infected hernias or small defects (less than 3 cm.).

Laparoscopic Hernia Repair

The surgeon will make several small punctures or incisions in the abdomen. Ports (hollow tubes) are inserted into the openings. The abdomen is inflated with carbon dioxide gas to make it easier to see the internal organs. Surgical tools and a laparoscopic light are placed into the ports. The hernia is repaired with mesh and sutured or stapled in place. The repair is done as a TransAbdominal PrePeritoneal (TAPP) procedure, which means the peritoneum (the sac that contains all of the abdominal organs) is entered, or the repair is done as a Totally ExtraPeritoneal (TEP) procedure.²⁻⁴

Nonsurgical Treatment

Watchful waiting is an option if you have an inguinal hernia with no symptoms.¹ Hernia incarceration occurred in 1.8 per 1,000 men who waited longer than 2 years to have a repair.² Femoral hernias should always be repaired because of the high risk (400 of 1,000) of incarceration and bowel strangulation within 2 years of diagnosis.²

Keeping You Informed

Open vs. Laparoscopic Incisional Repair

A laparoscopic repair of inguinal hernia may result in less pain and numbness, lower infection rate, and faster return to normal activity when compared with open surgery.⁶ Laparoscopic repair may lengthen the operative time and may cost more.⁵ A recurrence from a previous open hernia repair is best repaired laparoscopically because you avoid scar tissue from previous incisions.⁷ Laparoscopic repair of a bilateral (both sides of the groin) inguinal hernias also resulted in earlier return to work than open repairs.⁸

The risk of complications increases for both the open and laparoscopic procedure if the hernia extends into the scrotum.⁹

Risk of this Procedure

RISKS	WHAT CAN HAPPEN	KEEPING YOU INFORMED
Long-term pain	75 of 1,000 of patients reported chronic pain of the leg or groin lasting at least 3 months. ¹⁰ The rate of pain was 60 of 1,000 for the laparoscopy group and 90 of 1,000 for open repair.	Pain may be less with laparoscopic procedures than open procedures. ² Pain is reported as mild and continues to decrease over time. ¹¹ Pain can be treated with nonsteroidal anti-inflammatory medications.
Recurrence (hernia comes back)	Recurrence is reported in 37 of 1,000 patients. Recurrence occurs half as often when mesh is used versus nonmesh repair. ²	There is no difference in recurrence between mesh plugs, flat mesh, and open mesh. ² Laparoscopic repair is recommended for recurrent hernias because the surgeon avoids previous scar tissue. There is a higher rate of recurrence in older men with laparoscopic repair.
Urinary retention	Having trouble urinating occurs in 22 of 1,000 patients receiving general or regional anesthesia and 4 of 1,000 patients for local anesthesia. ⁹⁻¹²	General or regional anesthesia, older age and enlarged prostate are associated with urinary retention. A temporary urinary catheter may be inserted. ²⁻⁴
Seroma	A seroma (collection of clear/yellow fluid) can occur in 80 of 1,000 mesh repairs and 31 of 1,000 for nonmesh procedures.	Seromas can form around the former hernia site. Most disappear on their own. Removal of fluid with a sterile needle may be required. ²⁻⁴
Injury to internal organs: bowel, bladder, vas deferens, blood vessels	Injury can be caused by instruments inserted with laparoscopic repair. Bowel/bladder injury is reported as 1 per 1,000 and blood vessel injury is less than 1 in 1,000. ⁹⁻¹² The risk of (vas deferens) spermatic cord damage is rare. ¹³	For bladder injury, a Foley catheter remains in place to drain the urine until the bladder is healed, or surgical repair may be needed. For bowel injury, the site is repaired and/or a nasogastric tube is placed to keep the stomach empty. Any injury to a blood vessel is repaired. ²⁻⁴
Infection	Wound infection occurs in an average of 1-2 of 1,000 open repairs and 1 of 1,000 laparoscopic repairs. ¹⁴	Antibiotics may be given for inguinal or femoral hernia repair. ¹⁵ Smoking and having other diseases can increase the infection rate. ²
Hematoma	Hematoma, (collection of blood in the wound site or scrotum) occurs in 22 of 1,000 mesh procedures and 70 per 1,000 when mesh is not used. ⁹⁻¹²	Hematomas are treated with anti-inflammatory medications, elevation, and rest. Rarely blood replacement or further testing for a blood vessel injury is needed. ⁴
Testicular pain/swelling	Testicular pain is reported in 8 of 1,000 patients for mesh repair. Less than 1 of 1,000 men reported decreased libido following repair. ⁹⁻¹²	Postoperative testicular swelling (orchitis) may be due to manipulation of the veins near the testes. The swelling often appears 2-5 days after the operation and can last 6 to 12 weeks. Treatment includes anti-inflammatory medications. ²
Hernia at endoscopic site	Hernia at the site where the laparoscopic trochar (tube) was inserted occurs in less than 4 per 1,000. ⁴	This risk is reduced with the use of smaller trochars and instruments. ²⁻⁴
Nerve pain—tingling or numbness	Tingling and numbness in the groin or scrotum is reported less after laparoscopic procedures (74 of 1,000) than for open procedures (107 of 1,000). A nerve getting trapped at the site is reported in 2 of 1,000 patients. ⁹⁻¹²	Pressure, staples, stitches or a trapped nerve in the surgical area can cause nerve pain. Inform your doctor if you feel severe, sharp, or tingling pain in the groin and leg immediately after your procedure. An operation may be required if the nerve is trapped. ²
Heart/breathing	There are no reports of heart or breathing complications related specifically to a hernia operation.	Problems with your heart or lungs (breathing) may be aggravated by general anesthesia. Your anesthesia provider will suggest the best anesthesia option for you.
Elderly risks	Complications related to general anesthesia may be higher because of a health problem such as high blood pressure and shortness of breath in those 80 years and older. ¹⁶	If general anesthesia is a concern, an open surgery with local anesthesia may be recommended. ⁷
Death	No deaths are reported directly related to elective inguinal and femoral hernia repair. Death can occur after treatment of a strangulated hernia or in exceptionally high risk patients.	Stopping smoking and being at the ideal body weight before surgery reduces the risks of complications. Your surgical team is prepared for all emergency situations.

*The data has been averaged per 1,000 cases

Expectations: Preparation for Your Operation

Preparing for Your Operation

Home Medication

Bring a list of all of the medications and vitamins that you are taking. Your medication may have to be adjusted before your operation. Some medications can affect your recovery and response to the anesthesia. Most often you will take your morning medication with a sip of water.

Anesthesia

Let your anesthesia provider know if you have allergies, neurologic disease (epilepsy, stroke), heart disease, stomach problems, lung disease (asthma, emphysema), endocrine disease (diabetes, thyroid conditions), or loose teeth; if you smoke, drink alcohol, use drugs, or take any herbs or vitamins; or if you have a history of nausea and vomiting with anesthesia.

If you smoke, you should let your surgical team know and you should plan to quit. Quitting before your surgery can decrease your rate of respiratory and wound complications and increase your chances of staying smoke-free for life. Resources to help you quit may be found at www.facs.org/patienteducation or www.lungusa.org/stop-smoking.

Length of Stay

If you have local anesthesia, you will usually go home the same day. You may stay overnight if you had a repair of a large or incarcerated hernia, laparoscopic repair with a longer anesthesia time, postanesthesia issues such as severe nausea and vomiting, or you are unable to pass urine.

The Day of Your Operation

- Do not eat or drink for at least 6 hours before the operation.
- Shower and clean your abdomen and groin area with a mild antibacterial soap.
- Brush your teeth and rinse your mouth out with mouthwash.
- Do not shave the surgical site; your surgical team will clip the hair nearest the incision site.

What to Bring

- Insurance card and identification
- Advance Directives
- List of medicines
- Loose-fitting, comfortable clothes
- Slip-on shoes that don't require that you bend over
- Leave jewelry and valuables at home

What You Can Expect

An identification (ID) bracelet and allergy bracelet with your name and hospital/clinic number will be placed on your wrist. These should be checked by all health team members before they perform any procedures or give you medication. Your surgeon will mark and initial the operation site.

Fluids and Anesthesia

An intravenous line (IV) will be started to give you fluids and medication.

For general anesthesia, you will be asleep and pain free. A tube will be placed down your throat to help you breathe during the operation. For spinal anesthesia, a small needle with medication will be placed in your back near your spinal column. You will be awake and pain free.

After Your Operation

You will be moved to a recovery room where your heart rate, breathing rate, oxygen saturation, blood pressure, and urine output will be closely watched. Be sure that all visitors wash their hands.

Preventing Pneumonia and Blood Clots

Movement and deep breathing after your operation can help prevent postoperative complications such as blood clots, fluid in your lungs, and pneumonia. Every hour take 5 to 10 deep breaths and hold each breath for 3 to 5 seconds.

When you have an operation, you are at risk of getting blood clots because of not moving during anesthesia. The longer and more complicated your surgery, the greater the risk. This risk is decreased by getting up and walking 5 to 6 times per day, wearing special support stockings or compression boots on your legs, and, for high risk patients, taking a medication that thins your blood.

Questions to Ask

About my operation

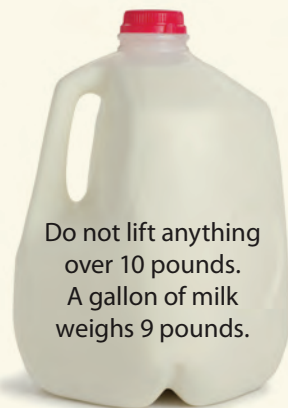
- What are the risks and side effects of general anesthesia?
- What technique will be used to repair the hernia—laparoscopic or open; mesh or with sutures?
- Ask your surgeon how frequently they perform laparoscopic hernia repairs?
- What are the risks of this procedure?
- Will you be performing the entire procedure yourself?
- What level of pain should I expect and how will it be managed?
- How long will it be before I can return to my normal activities—work, driving, lifting?

Your Recovery and Discharge

Keeping You Informed

High-Fiber Foods

Foods high in fiber include beans, bran cereals and whole-grain breads, peas, dried fruit (figs, apricots, and dates), raspberries, blackberries, strawberries, sweet corn, broccoli, baked potatoes with skin, plums, pears, apples, greens, and nuts.



Do not lift anything over 10 pounds. A gallon of milk weighs 9 pounds.

Your Recovery and Discharge

Thinking Clearly

If general anesthesia is given, or if you are taking narcotic pain medication, it may cause you to feel different for 2 or 3 days, have difficulty with memory, and feel more fatigued. You should not drive, drink alcohol, or make any big decisions for at least 2 days.

Nutrition

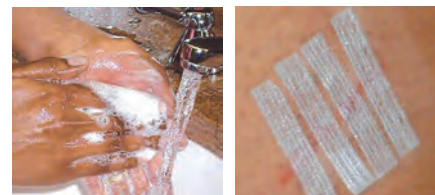
- When you wake up from the anesthesia, you will be able to drink small amounts of liquid. If you do not feel sick, you can begin eating regular foods.
- Continue to drink about 8 to 10 glasses of water per day.
- Eat a high-fiber diet so you don't strain while having a bowel movement.

Activity

- Slowly increase your activity. Be sure to get up and walk every hour or so to prevent blood clot formation.
- Patients usually take 2 to 3 weeks to return comfortably to normal activity.⁷
- You may go home the same day after a simple repair. If you have other health conditions or complications such as nausea, vomiting, bleeding, or difficulty passing urine, you may stay longer.
- Persons sexually active before the operation reported being able to return to sexual activity in 14 days (average).

Work and Return to School

- You may return to work after 1 to 2 weeks after laparoscopic or open repair, as long as you don't do any heavy lifting. Discuss the timing with your surgeon.
- Do not lift items heavier than 10 pounds or participate in strenuous activity for at least 4 to 6 weeks.
- Lifting limitation may last for 6 months after complex or recurrent hernia repairs.



Handwashing

Steri-strips

Wound Care

- Always wash your hands before and after touching near your incision site.
- Do not soak in a bathtub until your stitches, Steri-strips, or staples are removed. You may take a shower after the second postoperative day unless you are told not to.
- Follow your surgeon's instructions on when to change your bandages.
- A small amount of drainage from the incision is normal. If the dressing is soaked with blood, call your surgeon.
- If you have Steri-strips in place, they will fall off in 7 to 10 days.
- If you have a glue-like covering over the incision, just allow the glue to flake off on its own.
- Avoid wearing tight or rough clothing. It may rub your incisions and make it harder for them to heal.
- Protect the new skin, especially from the sun. The sun can burn and cause darker scarring.
- Your scar will heal in about 4 to 6 weeks and will become softer and continue to fade over the next year.

Bowel Movements

Avoid straining with bowel movements by increasing the fiber in your diet with high-fiber foods or over-the-counter medicines (like Metamucil and Fibercon). Be sure you are drinking 8 to 10 glasses of water each day.

Pain

The amount of pain is different for each person. The new medicine you will need after your operation is for pain control, and your doctor will advise how much you should take. You can use throat lozenges if you have sore throat pain from the tube placed in your throat during your anesthesia.

When to Contact Your Surgeon

Contact your surgeon if you have:

- Pain that will not go away
- Pain that gets worse
- A fever of more than 101°F or 38.3°C
- Continuous vomiting
- Swelling, redness, bleeding, or bad-smelling drainage from your wound site
- Strong or continuous abdominal pain or swelling of your abdomen
- No bowel movement by 2 to 3 days after the operation

Pain Control

Everyone reacts to pain in a different way. A scale from 0 to 10 is used to measure pain. At a "0," you do not feel any pain. A "10" is the worst pain you have ever felt. Following a laparoscopic procedure, pain is sometimes felt in the shoulder. This is due to the gas inserted into your abdomen during the procedure. Moving and walking helps to decrease the gas and the right shoulder pain.^{2,3}

Extreme pain puts extra stress on your body at a time when your body needs to focus on healing. Do not wait until your pain has reached a level "10" or is unbearable before telling your doctor or nurse. It is much easier to control pain before it becomes severe.

Common Medicines to Control Pain

Narcotics or opioids are used for severe pain. Possible side effects of narcotics are sleepiness, lowered blood pressure, heart rate, and breathing rate; skin rash and itching; constipation; nausea; and difficulty urinating. Some examples of narcotics include morphine and codeine.

Non-Narcotic Pain Medication. Most non-opioid analgesics are classified as non-steroidal anti-inflammatory drugs (NSAIDs). They are used to treat mild pain and inflammation or combined with narcotics to treat severe pain. Possible side effects of NSAIDs are stomach upset, bleeding in the digestive tract, and fluid retention. These side effects usually are not seen with short-term use. Let your doctor know if you have heart, kidney, or liver problems. Examples of NSAIDs include ibuprofen, Motrin, Aleve, and Toradol (given as a shot).

Pain Control without Medicine

Distraction helps you focus on other activities instead of your pain. Listening to music, playing games, or other engaging activities can help you cope with mild pain and anxiety.

Guided imagery helps you direct and control your emotions. Close your eyes and gently inhale and exhale. Picture yourself in the center of somewhere beautiful. Feel the beauty surrounding you and your emotions coming back to your control. You should feel calmer.



Guided imagery

OTHER INSTRUCTIONS:

FOLLOW-UP APPOINTMENTS

WHO:

DATE:

PHONE:

Keeping You Informed

Pain after Inguinal Hernia Repair

Pain that continues one year after inguinal hernia repair is reported as 110 of 1,000 patients, with moderate/severe pain reported in 17 of 1,000. 80% of patients with severe groin pain had pain before the operation. The pain decreased by 50% in one year. The incidence of pain is higher in women than in men.¹¹ Pain was higher when heavy versus light-weight mesh was used.¹¹ Most studies don't report a difference in chronic pain between open versus laparoscopic repair.

Glossary of Terms and More Information

For more information, please go to the American College of Surgeons Patient Education website at <http://www.facs.org/patienteducation/>. For a complete review of hernia repair, consult *Selected Readings in General Surgery*, "Hernia" 2012 Vol. 37 No. 8 at www.facs.org/SRGS/.

GLOSSARY

Advance Directives: Documents signed by a competent person giving direction to health care providers about treatment choices.

Computerized tomography (CT) scan: A diagnostic test X ray and a computer to create a detailed, three-dimensional picture of your abdomen. A CT scan is commonly used to detect abnormalities or disease inside the abdomen. It is sometimes used to find a hernia not obvious during the physical exam.

Digital exam: The examiner will place their gloved index finger gently into the scrotal sac and feel up to the inguinal ring in the groin. Then the patient is asked to strain.

Electrocardiogram (ECG): Measures the rate and regularity of heartbeats and any damage to the heart.

General anesthesia: A treatment with certain medicines that puts you into a deep sleep so you do not feel pain during surgery.

Hematoma: A collection of blood that has leaked into the tissues of the skin or in an organ, resulting from cutting in surgery or the blood's inability to form a clot.

Incarceration: The protrusion or constriction of an organ through the wall of the cavity that normally contains it.

Local anesthesia: The loss of sensation only in the area of the body where an anesthetic drug is applied or injected.

Nasogastric tube: A soft plastic tube inserted in the nose and down to the stomach which is used to empty the stomach of contents and gases to rest the bowel.

Seroma: A collection of serous (clear/yellow) fluid.

Strangulation: Part of the intestine or fat is squeezed in the hernia sac and blood supply to the tissue is cut off.

Ultrasound: Sound waves are used to determine the location of deep structures in the body. A hand roller is placed on top of clear gel and rolled across the abdomen. An ultrasound may be used to find a hernia that is not obvious during the physical exam.

Urinalysis: A visual and chemical examination of the urine, most often used to screen for urinary tract infections and kidney disease.

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The information provided in this report is chosen from recent articles based on relevant clinical research or trends. The research below does not represent all that is available for your surgery. Ask your doctor if he or she recommends that you read any additional research.

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DISCLAIMER

This information is published to educate you about your specific surgical procedures. It is not intended to take the place of a discussion with a qualified surgeon who is familiar with your situation. It is important to remember that each individual is different, and the reasons and outcomes of any operation depend upon the patient's individual condition.

The American College of Surgeons (ACS) is a scientific and educational organization that is dedicated to the ethical and competent practice of surgery; it was founded to raise the standards of surgical practice and to improve the quality of care for the surgical patient. The ACS has endeavored to present information for prospective surgical patients based on current scientific information; there is no warranty on the timeliness, accuracy, or usefulness of this content.

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