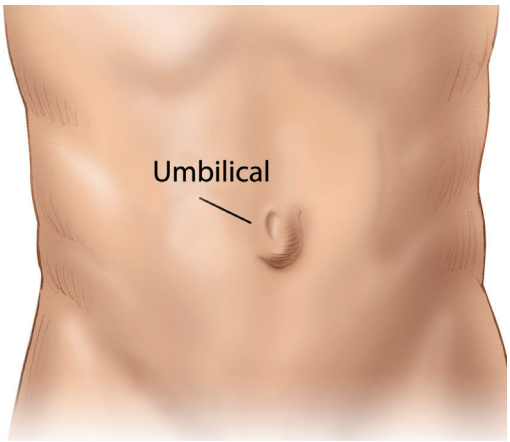
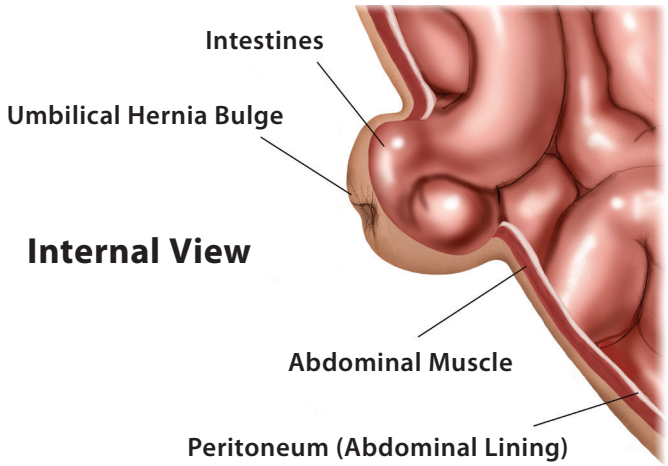
# Adult Umbilical Hernia Repair

ACS AMERICAN COLLEGE OF SURGEONS




**Umbilical Hernia Location**




## The Condition

An umbilical hernia occurs when tissue bulges out through an opening in the muscles on the abdomen near the navel or belly button (umbilicus). About 10% of abdominal hernias are umbilical hernias.[1]

### Common Symptoms

- Visible bulge on the abdomen, especially when coughing or straining
- Pain or pressure at the hernia site

## Treatment Options

### Surgical Procedure

**Open hernia repair**—An incision is made near the site. Your surgeon will repair the hernia with mesh or by suturing (sewing) the muscle layer closed.

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

### Watchful Waiting

You may be able to wait to repair umbilical hernias that are very small, reducible (can be pushed back in) and not uncomfortable.[3] If your hernia is not surgically repaired, there is a 4% risk that it can strangulate within the next five years. This means that your intestines can be squeezed in the hernia pouch with the blood supply cut off. In this case you will need emergency surgery.

## 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.

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

**Possible risks include** return of the hernia; infection; injury to the bladder, blood vessels, intestines, or nerves; and continued pain at the hernia site.

## Expectations

**Before your operation**—Evaluation may include blood tests, urinalysis, and ultrasound. 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 six 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**—For a simple repair, you may go home the same day. You will need to stay longer for complex repairs.[4]

**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 three 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





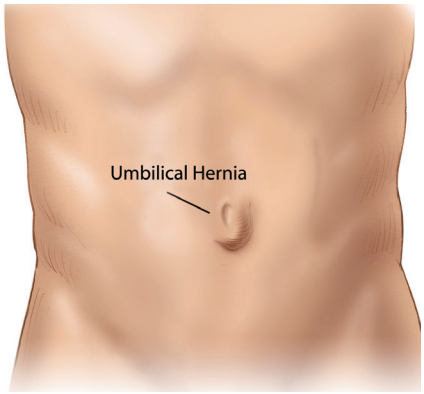
## Keeping You Informed

### Who Gets an Umbilical Hernia?

Ten percent of all hernias in adults are umbilical.[5] They are three times more common in women due to pregnancy. They are equally as common in men and women over 60 years as abdominal muscles start to weaken.[6]

### Pregnancy Considerations

Pregnancy may cause a hernia because of increased abdominal pressure. Hernia among pregnancies is 0.08%. If the hernia is not complicated, but symptomatic, it should be repaired. If the hernia is incarcerated or strangulated it will require an emergency repair.[7]




**Hernia Location**

## The Condition

An **umbilical hernia** occurs when part of the intestine or fatty tissue bulges through the muscle near the belly button (navel, umbilicus). Most adult umbilical hernias are caused by increased abdominal pressure against a weak abdominal wall (acquired hernia).

A **reducible hernia** can be pushed back into the opening or decrease in size when lying flat. When intestine or abdominal tissue fills the hernia sac and cannot be pushed back, it is **irreducible or incarcerated**. A hernia is **strangulated** if the intestine is trapped in the hernia pouch and the blood supply to the intestine is cut off. **This is a surgical emergency and a bowel resection may also be needed**.[8]

## Symptoms

The most common symptoms are:

- Bulge in the abdominal area that often increases with coughing or straining
- Pain or pressure at the hernia site
- Increasing sharp abdominal pain and vomiting can mean that the hernia is **strangulated. This is a surgical emergency and immediate treatment is needed**.

Because abdominal muscles weaken with age, the hernia can increase in size, and there is a risk of incarceration and strangulation.[2] Abdominal binders that apply pressure and push back the bulge will not repair the hernia.

## Some risk factors are:

- Older age—muscles become weaker
- Overweight and obesity—increased weight places pressure on abdominal muscle
- Chronic straining
- Family history
- Ascites: excess fluid in the space between the tissues lining the abdomen and abdominal organs; may be due to alcoholism
- Pregnancy, particularly multiple pregnancies

## Common Diagnostic Tests

### History and Physical Exam

Checks for the presence of bulge

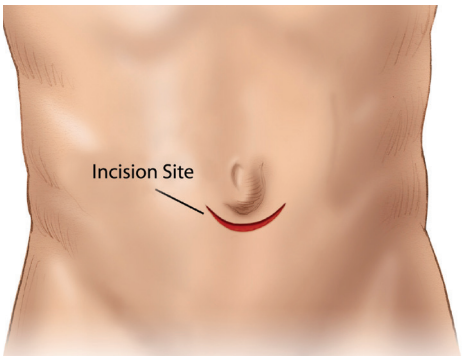
Umbilical hernias are usually diagnosed by clinical examination only. Imaging by ultrasound or CT scan can be considered if clinical examination is unsure.

### Additional Tests (see Glossary)

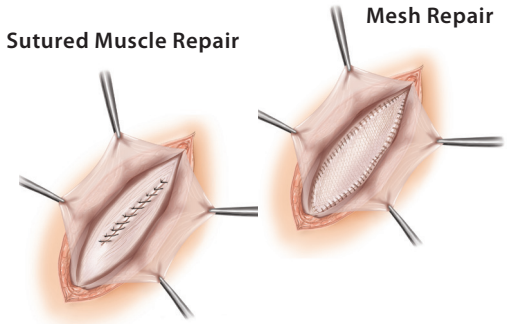
Other tests may include:

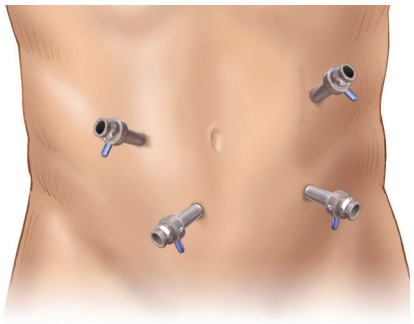
- Ultrasound
- Computerized tomography (CT) scan
- Blood tests
- Urinalysis
- Electrocardiogram (ECG)–for patients over 45 or if high risk of heart problems

# Surgical and Nonsurgical Treatment




Open Repair



Laparoscopic Repair

## Surgical Treatment

The type of operation depends on hernia size and location, and if it is a repeat hernia (recurrence). Your health, age, and the surgeon's expertise are also important. An operation is the only treatment for a hernia repair.

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 gently pushed back into the abdomen. Sutures or mesh are used to close the muscle.

- For a suture-only repair: The hernia sac is removed. Then the tissue along the muscle edge is sewn together. The umbilicus is then fixed back to the muscle. This procedure is often used for small defects.[9]
- Hernioplasty/Open mesh repair: The hernia sac is removed. Mesh is placed beneath the hernia site. The mesh is attached using sutures sewn into the stronger tissue surrounding the hernia. The mesh extends 3 to 4 cm beyond the edges of the hernia. Open mesh and laparoscopic repair for umbilical hernias do not differ in 30-day outcomes or in risk of recurrence.[1]
- For all open repairs, the skin site is closed using sutures, staples, or surgical glue.
- An open repair may be done with local anesthesia and sedation given through an IV.
- Your surgeon may inject a local anesthetic around the hernia repair site to help control pain.
- With complex or large hernias, small drains may be placed going from inside to the outside of the abdomen.

### Laparoscopic Hernia Repair

Laparoscopic repair decreases the risk of wound complications and may be preferred for large (over 4 cm) umbilical hernias. Laparoscopic repair may be considered for medium-sized hernias in patients at high risk of wound infection.

The surgeon will make several small punctures or incisions in the abdomen. Ports or trocars (hollow tubes) are inserted into the openings. Surgical tools and a lighted camera are placed into the ports. The abdomen is inflated with carbon dioxide gas to make it easier for the surgeon to see the hernia. Mesh may be sutured or fixed with staples to the muscle around the hernia site. The port openings are closed with sutures, surgical clips, or glue.

**Herniorrhaphy** is the surgical repair of a hernia.

**Hernioplasty** is surgical repair of a hernia with mesh inserted to reinforce the weak area.

## Nonsurgical Treatment

Watchful waiting is not usually recommended except for very small umbilical hernias.[2] A surgical repair is recommended for adults who have symptoms, incarceration, thinning of the skin, or uncontrollable ascites.

## Keeping You Informed

### Open versus Laparoscopic Repair

There is no significant evidence on the best technique to repair an umbilical hernia. The type of repair may also depend on the size of the hernia.

- Open mesh and laparoscopic repair for umbilical hernias do not differ in 30-day outcomes or in risk of recurrence. There is a slightly lower wound complication rate, including seromas, hematomas, and infection, with laparoscopic repair.[1] Both types of operations have similar long- term results.
- Open repairs can be done with local anesthesia instead of general anesthesia and are frequently done as outpatient procedures.
- Strangulated hernias may have to be repaired as an open approach.
- The use of mesh provides a stronger repair and decreases the rate of recurrence.
- Suture repair will result in a small incision around the hernia site. Laparoscopic repairs usually have 3 to 4 smaller scars at the site of the entry ports.

# Risks of this Procedure



## Risks Based on the ACS Risk Calculator

**Open and Laparoscopic Umbilical Hernia Surgery from the ACS Risk Calculator – March 30, 2022**

| Risks | Percent for Average Patient | Keeping You Informed |
|---|---|---|
| **Wound Infection:** Infection at the area of the incision or near the organ where the surgery was performed | **Open** 1.3%<br>**Laparoscopic** 0.6% | Smoking and obesity increase the risk of postoperative wound complications in general. Smoking cessation is advised for 4–6 weeks, and weight loss to BMI below 35 before elective umbilical repair. |
| **Complications:** Including surgical infections, breathing difficulties, blood clots, renal (kidney) complications, cardiac complications, and return to the operating room | **Open** 2.1%<br>**Laparoscopic** 2.6% | Complications related to general anesthesia and surgery may be higher in smokers, elderly and/or obese patients, and those with high blood pressure and breathing problems. Wound healing may also be decreased in smokers and those with diabetes and immune system disorders. |
| **Pneumonia:** Infection in the lungs | **Open** 0.1%<br>**Laparoscopic** 0.2% | Movement, deep breathing, and stopping smoking can help prevent respiratory infections. |
| **Urinary tract infection:** Infection of the bladder or kidneys | **Open** 0.2%<br>**Laparoscopic** 0.1% | Drinking fluids and catheter care decrease the risk of bladder infection. |
| **Venous thrombosis:** A blood clot in the legs that can travel to the lungs | **Open** 0.1%<br>**Laparoscopic** 0.1% | Longer surgery and bed rest increase the risk. Getting up, walking 5 to 6 times per day, and wearing support stockings reduce the risk. |
| **Death** | 0% | Your surgical team is prepared for all emergency situations. |
| **Risks from Outcomes Reported in the Last 10 years of Literature** | **Percent for Average Patient** | **Keeping You Informed** |
| **Immediate postoperative pain** | The method of repair does not appear to cause significant difference in early post-operative pain. | There may be a feeling of tightness in your abdomen because the muscle has been pulled together. Your pain will be managed with nonsteroidal anti-inflammatory medications and by resting and avoiding straining or lifting. |
| **Recurrence:** A hernia can recur after the repair | **Suture repairs** 17%<br>**Mesh repairs** 2.3%[13] | The use of mesh or other type of patch repair appears to reduce the rate of recurrence.[13] Ascites, liver disease, diabetes, obesity, and suture repair without mesh are associated with recurrence.[12] |
| **Seroma:** A collection of clear/yellow fluid<br>**Hematoma:** a collection of blood in the wound site or scrotum | **Open & Laparoscopic**<br>**Suture repairs** 50 of 1,000<br>**Mesh repairs** 60 of 1,000 [9] | Seromas are the most common complication after umbilical hernia repair. Seromas can form around the former hernia site. Removal of fluid with a sterile needle may be required.<br>Hematomas are treated with anti-inflammatory medications, elevation, and rest. |

*The data have been averaged per 1,000 cases*

**The ACS Surgical Risk Calculator estimates the risk of an unfavorable outcome. Data is from a large number of patients who had a surgical procedure similar to this one. If you are healthy with no health problems, your risks may be below average. If you smoke, are obese, or have other health conditions, then your risk may be higher. This information is not intended to replace the advice of a doctor or health care provider. To check your risks, go to the ACS Risk Calculator at *http://riskcalculator.facs.org***

# Expectations: Preparation for Your Operation



## Preparing for Your Operation

### Home Medication

Bring a list of all of the medications, vitamins, and any over-the-counter medicines that you are taking. Your medications may have to be adjusted before your operation. Some medications can affect your recovery and response to 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; use alcohol or drugs; 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. Quitting also increases your chances of staying smoke-free for life. Resources to help you quit may be found at *Resources to help you Quit Smoking may be found at: https://www.facs.org/education/patient-education/patient-resources/prepare/quit-smoking*

### Length of Stay

If you have local anesthesia, you will usually go home the same day. You may stay overnight if you have a repair of a large or incarcerated hernia. A laparoscopic repair may result in a longer anesthesia time. Complications such as severe nausea and vomiting or an inability to pass urine may also result in a longer stay.

## The Day of Your Operation

- Your healthcare team will advise you when to stop eating and drinking before the operation.
- You should bathe or shower and clean your abdomen, especially around the umbilical area, with a mild antibacterial soap.
- You should brush your teeth and rinse your mouth with mouthwash.
- Do not shave the surgical site; the surgical team will clip the hair near the incision site.

### What to Bring

- Insurance card and identification
- Advance directives (see glossary)
- 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 during the operation. A tube may 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 alongside your spinal column. You will be awake during the operation but 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. 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 side effects and risks of anesthesia?
- What technique will be used to repair the hernia? (Laparoscopic or open? Mesh or with sutures?)
- What are the risks of this procedure for me?
- Will you be performing the entire operation 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



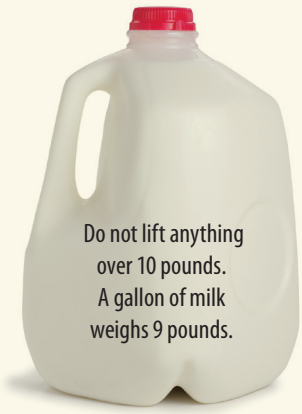
## Keeping You Informed

### High-Fiber Foods

Avoid straining with bowel movements by increasing the fiber in your diet with high-fiber foods.

Be sure you are drinking 8 to 10 glasses of water each day.

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.




## Your Recovery and Discharge

### Thinking Clearly

If general anesthesia is given or if you are taking narcotics for pain, it may cause you to feel different for 2 or 3 days. You may have trouble remembering and feel tired. You should not drive, drink alcohol, or make any big decisions for at least 2 days.

### Nutrition

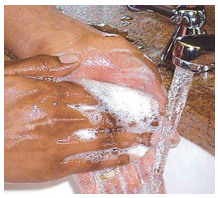
- When you wake up from the anesthesia, you will be able to drink small amounts of liquid. If you do not feel sick, you can begin eating regular foods.
- Continue to drink about 8 to 10 glasses of water each day.
- Eat a high-fiber diet so you don't strain while having a bowel movement.

### Activity

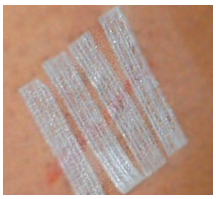
- Slowly increase your activity. Be sure to get up and walk every hour or so to prevent blood clot formation.
- You may go home the same day for a simple repair. If you have other health conditions or complications, such as nausea, vomiting, bleeding, or infection after surgery, you may stay longer.

### Work and Return to School

- After recovery, you can usually return to work within 2 to 3 days.
- You will not be able to lift anything over 10 pounds, climb, or do strenuous activity for 4 to 6 weeks following surgical repair of an umbilical hernia.
- Lifting limitation may last for 6 months for complex or recurrent repairs.[2]



**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, allow the glue to flake off on its own.
- Avoid wearing tight or rough clothing. It may rub against 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.
- You can access the ACS Surgical Wound Home Management Program here: *https://www.facs.org/education/patient-education/skills-programs/wound-care*

## Pain Control

Your pain can be controlled using acetaminophen (Tylenol®) and ibuprofen (Motrin®,Advil®). Nonmedication therapies, such as ice may also be effective. For severe pain that is keeping you from moving and sleeping, an opioid may be needed. By day 4, most people report no severe pain after an operation. Pain from the surgical incision is usually gone in 7 to 10 days. See the **Safe and Effective Pain Control Guide** below or on the ACS website for more information. *https://www.facs.org/education/patient-education/safe-pain-control*

| Pain | How Intense is my pain | What Can I Take to Feel Better | Most Common Therapies |
|---|---|---|---|
| Mild | • I hardly notice my pain, and it does not interfere with my activities.<br>• I notice my pain and it distracts me, but I can still do activities (sitting up, walking, standing). | **Non-medication therapies**<br>+<br>**Non-opioid, oral medications**<br>• Take as needed when you feel pain.<br>• These help to decrease pain and swelling (inflammation) | **Non-medication Therapies**<br>• Ice, elevation, rest, meditation, massage, distraction (music, TV, play) walking and mild exercise<br>• Splinting the abdomen with pillows<br>**Non-Opioid Medication**<br>• Acetaminophen (Tylenol®)<br>• Non-steroidal anti-inflammatory drugs (NSAIDS) Aspirin, Ibuprofen (Motrin®, Advil®) Naproxen (Aleve®) |
| Moderate | • My pain is hard to ignore and is more noticeable even when I rest.<br>• My pain interferes with myusual activities. | **Non-Medication Therapy**<br>+<br>**Non-opioid, oral medication**<br>Take these on a regular schedule | **Non-medication Therapy plus Non-opioid medication**<br>on a regular schedule instead of as needed. (Ex: Tylenol® every 6 hours at 9am, 3pm, 9pm, 3am and Motrin® every 6 hours and 12am,6am,12pm, 6pm |
| Severe | • I am focused on my pain, and I am not doing my daily activities.<br>• I am groaning in pain, and I cannot sleep. I am unable to do anything.<br>• My pain is as bad as it could be, and nothing else matters. | **Non-Medication Therapy**<br>+<br>**Non-opioid, oral medication**<br>• Take these on a regular schedule<br>**Short-acting Opioids**<br>• Take for a few days and decrease/ stop as soon as possible | Opioids block pain and give a feeling of euphoria (feel high). Addiction, a serious side effect of opioids, is rare with short term use.<br>Examples of short-acting opioids include: Tramadol (Ultram®), Hydrocodone (Norco®, Vicodin®), Hydromorphone (Dilaudid® |

# More Information

*For more information, please go to the American College of Surgeons Patient Education website at www.facs.org/patienteducation.*
*For a complete review of hernia repair, consult Selected Readings in General Surgery, Volume 45, No. 5, 2019, Hernia.*

## GLOSSARY

**Abdominal X ray:** Checks for any loops of bowel or air-filled sacs.

**Abdominal 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.

**Ascites:** Excess fluid in the space between the tissues lining the abdomen and abdominal organs; may be due to alcoholism or liver disease.

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

**Blood tests:** Tests usually include a Chem-6 profile (sodium, potassium, chloride, carbon dioxide, blood urea nitrogen and creatinine) and complete blood count (red blood cell and white blood cell count).

**Computerized tomography (CT) scan:** A diagnostic test using X ray and a computer to create a detailed, three-dimensional picture of your abdomen. A CT scan normally takes about 15 minutes or less.

**Electrocardiogram (ECG):** Measures the rate and regularity of heartbeats, the size of the heart chambers 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.

**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.

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

## DISCLAIMER

The American College of Surgeons (ACS) is a scientific and educational association of surgeons that was founded in 1913 to improve the quality of care for the surgical patient by setting high standards for surgical education and practice. The ACS endeavors to provide procedure education for prospective patients and those who educate them. It is not intended to take the place of a discussion with a qualified surgeon who is familiar with your situation. The ACS makes every effort to provide information that is accurate and timely, but makes no guarantee in this regard.

## REFERENCES


1. Shankar DA, Itani KMF, O'Brien WJ, Sanchez VM. Factors Associated with Long-term Outcomes of Umbilical Hernia Repair. *JAMA Surg*. 2017;152(5):461-466. doi:10.1001/jamasurg.2016.5052
2. Kokotovic D, Sjølander H, Gögenur I, Helgstrand F. Watchful waiting as a treatment strategy for patients with a ventral hernia appears to be safe. *Hernia* 2016; 20: 281–287.
3. Henriksen NA, Montgomery A, Kaufmann R, Berrevoet F, East B, Fischer J, et al. Guidelines for treatment of umbilical and epigastric hernias from the European Hernia Society and Americas Hernia Society. BJS Br J Surg. 2020;107(3):171-90.
4. https://riskcalculator.facs.org/RiskCalculator/March 30, 2022.
5. Coste AH, Jaafar S, Misra S, Parmely JD. Umbilical hernia. *InStatPearls* [Internet] 2019 Sep 29. StatPearls Publishing.
6. Dabbas N, Adams K, Pearson K, Royle GT. Frequency of abdominal wall hernias: is classical teaching out of date? *JRSM short reports*. 2011 ;2(1):1-6.
7. Kulacoglu H. Umbilical Hernia Repair and Pregnancy: Before, during, after…. *Front Surg*. 2018;5:1. Published 2018 Jan 29. doi:10.3389/fsurg.2018.00001
8. Ozbagriacik M, Bas G, Basak F, et al. Management of strangulated abdominal wall hernias with mesh; early results. *North Clin Istanb*. 2015;2(1):26-32. Published 2015 Apr 24. doi:10.14744/nci.2015.03522.
9. Hernia Repair Surgery. https://my.clevelandclinic.org/health/treatments/17967-hernia-repair-surgery. Accessed March 31, 2022.
10. Helgstrand F. National results after ventral hernia repair. *Dan Med* J. 2016 Jul;63(7):B5258. PMID: 27399983.
11. Kaufmann R, Halm JA, Eker HH, et al. Mesh versus suture repair of umbilical hernia in adults: a randomised, double-blind, controlled, multicentre trial. *Lancet*. 2018;391(10123):860–9. *https://doi.org/10.1016/S0140-6736(18)30298-8*.
12. Shaukat N, Jaleel F, Jawaid M, Zulfiqar I. Is there difference in chronic pain after Suture and Stapler fixation method of mesh in Ventral Hernia? Is stapler fixation method quicker? A randomized controlled trial. *Pak J Med Sci*. 2018;34(1):175-178. doi:10.12669/pjms.341.
13. Kokotovic D, Bisgaard T, Helgstrand F. Long-term recurrence and complications associated with elective incisional hernia repair. *J Am Med Assoc* 2016;316:1575-82.


**Reviewed April 2016 by:** Nancy Strand, MPH, RN
Mark Malangoni, MD, FACS
Brian Heniford, MD, FACS

**Revised April 2022:** Nancy Strand, MPH, RN