

Pediatric Umbilical Hernia Repair



100 years

AMERICAN COLLEGE OF SURGEONS

*Inspiring Quality:**Highest Standards, Better Outcomes*

Patient Education

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

Keeping You Informed

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

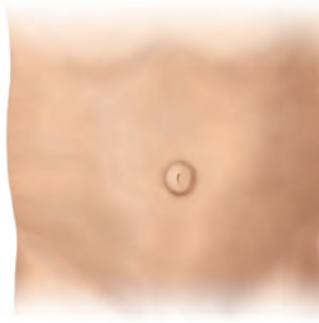
Education is provided on:

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

SURGICAL PATIENT EDUCATION PROGRAM

Prepare for the Best Recovery

Umbilical Hernia Location



The Condition

A hernia occurs when a small sac containing tissue bulges out through an opening in the muscles. An umbilical hernia is caused by the muscles not closing around the hole left by the umbilical cord. This can occur at the site above the navel (epigastric) or around the navel (umbilical).

Common Symptoms

- A visible bulge on the abdomen, especially when crying or straining
- Abdominal pain is rare in children unless there is incarceration (tissue stuck in the hernia sac)¹

Treatment Options

Surgical Procedure

Open hernia repair—An incision is made along the inferior edge of the umbilicus. The surgeon will repair the hernia by suturing (sewing) the muscle closed.

Nonsurgical Procedure

Many small (< 1-1.5 cm) umbilical hernias will close spontaneously as the child grows between birth and 4 years of age, thus eliminating the need for surgical repair. If spontaneous closure has not occurred by this time, then surgical repair is indicated before the child's 5th birthday.²

Benefits and Risks of Your Child's Operation

Benefits—An operation is the only way to repair a hernia that has not closed on its own. A child will be able to return to their normal activities in a short amount of time, and, in most cases, discomfort from the procedure will last only a few days.

Risks of not having an operation—The hernia may cause pain and increase in size. If the intestine becomes squeezed in the hernia sac (incarceration), there may be sudden pain, vomiting, and the need for an immediate operation.

Possible risks include—Complications are rare. There is a very small rate of wound infection and hematoma (collection of blood) after an umbilical hernia repair in children.³

Expectations

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

The day of the operation—Your child will not eat or drink for six hours before the operation (verify the recommended time with your surgeon or anesthesiologist). Check with the doctor's office to see if your child should take their routine medication. A parent can usually stay with the child in the OR waiting area and again during recovery.

Your child's recovery—Your child will likely go home from the recovery room within a few hours for small hernia procedures but may need to stay in the hospital longer following complex repairs.

Call your child's surgeon if your child has severe pain, stomach cramping, chills or a high fever (over 101°F or 38.3°C), odor or increased drainage from the incision, or has no bowel movements for three days.

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

The Condition, Symptoms, and Diagnostic Tests

Pediatric Umbilical Hernia Repair

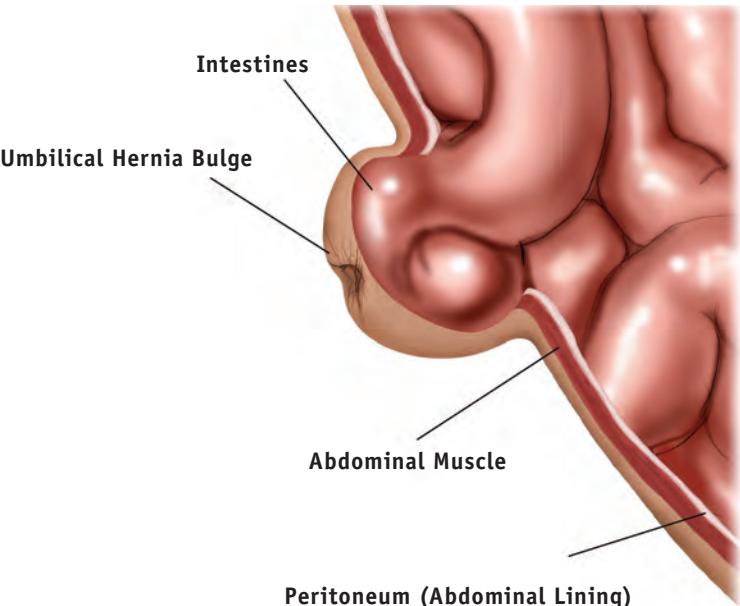
Keeping You Informed

Umbilical hernias are one of the most common conditions in children. They occur more often in:

- Premature infants²
- 32 of 100 African-American newborns¹
- 80 of 100 low birth weight infants¹
- An equal number of boys and girls⁴

Incarceration occurs in less than 1 of 100 children and premature infants.⁵

Internal View of Umbilical Hernia



Umbilical Hernia Location



The Condition

An **umbilical hernia** occurs when part of the intestine or fatty tissue bulges through a weak muscle near the belly button (navel, umbilicus). 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 called **irreducible or incarcerated**. A hernia is **strangulated** if the intestine is squeezed in the hernia pouch and the blood supply to the intestine is cut off. **This is a surgical emergency.**³

A **congenital hernia** develops in the fetus during pregnancy and is present at birth.

Symptoms

The most common symptoms are:

- A bulge in the abdominal area that often increases with crying or straining.
- An umbilical hernia usually does not cause pain in children.²
- Increasing sharp abdominal pain and vomiting can mean that the hernia is **strangulated**. **This is a surgical emergency and immediate treatment is needed.**

Common Tests

History and Physical Exam

The site is checked for a bulge.

Other tests may include:

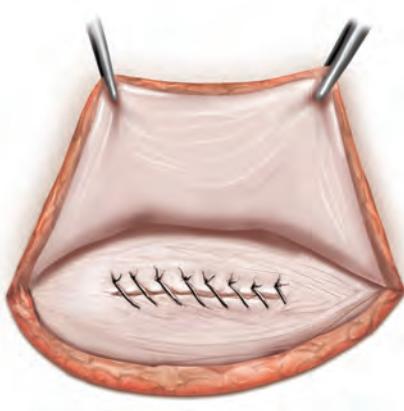
- Blood tests
- Urinalysis

Surgical and Nonsurgical Treatment

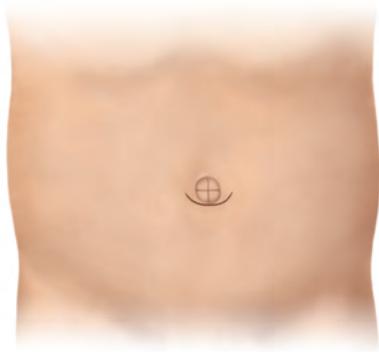
Hernia Incision Site



Closure of Muscle



Repaired Umbilical Hernia



Surgical Treatment

The type of operation depends on hernia size, location, and if it is a repeat hernia. The child's age, health, anesthesia risk, and the surgeon's expertise are also important. Surgical repair is usually performed by a pediatric general surgeon. An operation is the only treatment for a hernia repair.

Surgical repair of an umbilical hernia in children may be needed if:

- The hernia is painful and stuck in a bulging position (incarcerated)
- Blood supply is affected (strangulated)
- The hernia has not closed by age 5
- The defect is large or bothersome in appearance²

Open Hernia Repair

Suture repair is the primary type of umbilical hernia repair for infants and children. The surgeon makes an incision near the hernia site, and the bulging tissue is gently pushed back into the abdomen. Sutures are used to close the muscle.

- **For suture-only repair**

(Herniorrhaphy): 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.

- The skin is closed using subcuticular absorbable sutures or surgical glue.
- General anesthesia is typically required to perform the surgical repair.

Nonsurgical Treatment

Watchful waiting is recommended for children who have no symptoms. In 95% of cases, umbilical hernias less than 1 cm in diameter usually close on their own within 5 years of age.² After age 5, repair is recommended.

Keeping You Informed

Pushing the umbilical hernia back into the abdomen and taping or strapping a coin to the umbilical area to try to close the hernia is not effective and is not recommended.⁶ Many umbilical hernias resolve themselves by age one, and surgery is usually not needed unless the hernia does not go away by age 5.

Risks of this Procedure

RISKS	WHAT CAN HAPPEN	KEEPING YOU INFORMED
Immediate postoperative pain	Postoperative pain following umbilical hernia repair in children is not severe and lasts only a few days. ⁶	Most children only need ibuprofen or Tylenol for pain relief once they are home. ⁷ These medications should be taken only if needed and are given by mouth every 4-6 hours.
Long-term pain	There are no reports of long-term pain in follow-up visits up to one year after repair.	Your child's pain should decrease within a few days. Follow up with the doctor if your child is still uncomfortable.
Sedation and anesthesia	Breathing problems such as decreased oxygen levels, stridor (noisy breathing) and spasms of the larynx, or apnea (temporary lack of breathing) occurred in 2.5 of 1,000 pediatric surgeries. Increased secretions or vomiting occurred in 5 of 1,000 pediatric sedation or anesthesia procedures. ⁸	Serious adverse effects were rare, and no deaths were reported in over 30,000 cases of pediatric sedation and anesthesia procedures. ⁸ Your anesthesia provider will suggest the best anesthesia option for you.
Seroma	A seroma (collection of fluid) occurred in 2 of 1,000 repairs. ⁶	Seromas can form around the former hernia site. Most seromas will disappear on their own. Removal of fluid with a sterile needle may be required.
Hematoma	A hematoma (collection of blood) occurred in 6 of 1,000 cases of pediatric umbilical hernia repair. ⁶	A pressure dressing may be applied for a few days after surgery. Currently, there is no evidence that a pressure dressing decreases the risk of developing a hematoma. ¹
Infection	Wound infections occurred in 7 of 1,000 repairs in children. ⁹	The incision will be held together with Steri-strips and covered with a clear dressing. ⁶ Wash hands before caring for the incision site and do not allow the child to soak in a tub until the Steri-strips fall off. Notify the doctor's office of any signs of infection such as fever, pain, redness, or swelling at the site. (see pg. 7; When to contact your surgeon)
Incarceration and strangulation	Strangulation requiring emergency surgery occurred in 8 of 1,000 children. ⁹	Surgical outcome is good in children, even with incarcerated or strangulated hernias, as long as fluid and electrolyte balance is corrected and the hernia is repaired quickly. ⁹
Recurrence (hernia comes back)	Recurrence occurred in less than 1 of 1,000 umbilical hernia repairs in children.	Laparoscopic repair is recommended for recurrent hernias, as the surgeon avoids previous scar tissue.
Death	No surgical deaths are reported directly related to umbilical hernia repair in children.	Your surgical team will closely monitor your child for any complications.

The data has been averaged per 1,000 cases

Expectations: Preparing for Your Child's Operation

Pediatric Umbilical Hernia Repair



Preparing for Your Operation

Home Medication

Bring a list of all of the medications and vitamins that your child is taking. Some medications may have to be adjusted before the operation and can affect your child's recovery and response to anesthesia.

Anesthesia

Let your anesthesia provider know if your child has allergies, neurologic disease (epilepsy), heart disease, stomach problems, lung disease (asthma), endocrine disease (diabetes, thyroid conditions), or loose teeth.

Length of Stay

If your child is having local anesthesia, they will usually go home the same day. They may need to stay longer if they have had laparoscopic surgery with general anesthesia, a larger hernia with mesh repair, an incarcerated hernia, nausea, or vomiting. All hospitals allow a parent to stay the night in a room with their child.

The Day of Your Operation

Follow these guidelines or those provided by your surgeon for when your child should stop eating or drinking.¹⁰

Type:	Limit:
Light meal: Toast, cereal, soup	6 hrs
Infant formula or milk products	6 hrs
Breast milk, orange juice	4 hrs
Clear liquids: Water, fruit juice without pulp, clear tea or carbonated beverages	2 hrs

- They should bathe or shower and clean their abdomen with mild antibacterial soap.
- They should brush their teeth and rinse their mouth with mouthwash.

What to Bring

- Insurance card and identification
- List of medicines
- Loose-fitting, comfortable clothes
- Slip-on shoes that don't require your child to bend over
- Favorite toy or book for recovery period

What You Can Expect

Safety Checks

An identification (ID) bracelet and allergy bracelet with your child's name and hospital/clinic number will be placed on their wrist. These should be checked by all health team members before providing any procedures or giving your child medication. The surgeon will mark and initial the operation site.

Fluids and Anesthesia

An intravenous line (IV) will be started to give your child fluids and medication. This is usually inserted after your child is asleep in the operating room.

General anesthesia is most often used, and your child will be asleep and pain free for this surgery.¹ A tube will be placed down your child's throat to help your child breathe during the operation. For spinal anesthesia, a small needle with medication will be placed in their back alongside the spinal column. They will be awake but pain free.

After the Operation

Your child will be moved to a recovery room where their heart rate, breathing rate, oxygen saturation, and blood pressure will be closely watched. Be sure all visitors wash their hands.

Preventing Pneumonia and Blood Clots

Movement and deep breathing after the operation can help prevent postoperative complications.

Questions to Ask

About my child's operation:

- What are the side effects and risks of anesthesia?
- What are the risks of this procedure for my child?
- Will you be performing the entire operation yourself?
- What level of pain should I expect my child to have, and how will it be managed?
- How long will it be before my child can return to normal activities (school, play, sports)?

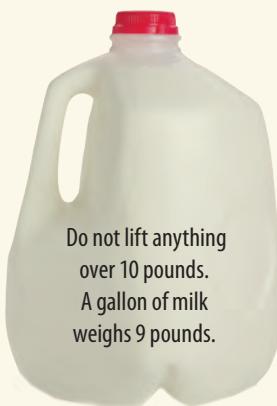
Recovery and Discharge

Keeping You Informed

Wash your hands before and after touching near the incision site.



Leave Steri-strips or surgical glue in place. It falls off in 7 to 10 days.



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

Thinking Clearly

If general anesthesia is given, it is not unusual for some children to feel upset and confused as anesthesia is wearing off.⁷ Your child may need more sleep than usual the first day home, and allowing them to wake naturally should help.

Nutrition

When your child wakes up from the anesthesia, they will be able to drink small amounts of liquid. If they do not feel sick, they can return to their regular diet.

Activity

- Your child will slowly increase their activity. They should get up and walk every hour or so to prevent breathing problems, pneumonia, and constipation.
- There is no lifting, climbing, or strenuous physical activity for several weeks following surgical repair of umbilical hernia.
- Children can usually return to normal activities within a few days. Depending on the size of the hernia, activity may be restricted for 1 to 2 weeks.

Work and Return to School

After recovery, your child should be able to return to school in 2 to 3 days.¹ Rarely, a pediatric umbilical hernia will recur after being repaired surgically.

Wound Care

- Always wash your hands before and after touching near the incision site.
- Your child may have Steri-strips over the incision site. These will fall off in 7 to 10 days. There may be a clear dressing over the Steri-strips which can usually be removed after 48 hours.¹
- Your child may shower or bathe after 2 days but avoid prolonged soaking.
- A small amount of drainage from the incision may occur. If the dressing is soaked with blood, call your surgeon.
- Do not allow your child to wear tight or rough clothing. It may rub against the incisions and make it harder for them to heal.
- Follow any special instructions from your surgeon for wound care.
- Protect the new skin, especially from the sun. The sun can burn and cause darker scarring.
- The incision will heal in about 4 to 6 weeks and will become softer and continue to fade over the next year.

Pain after Umbilical Hernia Repair

Most children have mild pain after the repair of an umbilical hernia. Children's acetaminophen (Tylenol), ibuprofen, or Tylenol with hydrocodone (Lortab elixir) can be used to relieve pain, with most children needing only 1 to 2 doses. Throat lozenges or popsicles for sore throat pain or dryness from the tube placed in the throat during anesthesia can also help.

When to Contact Your Surgeon

Contact your surgeon if your child has:

- Pain that will not go away
- Pain that gets worse
- A fever of more than 101°F or 38.3°C
- Vomiting
- Swelling, redness, bleeding, or bad-smelling drainage from the wound site
- Strong or continuous abdominal pain or swelling of the abdomen
- No bowel movement 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 for older children. At a "0," you do not feel any pain. A "10" is the worst pain you have ever felt. Extreme pain puts extra stress on your body at a time when your body needs to focus on healing.

Young children will rate their pain using a picture scale. If your child has pain at home, you may use this same scale.

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 your child has allergies, diabetes, or any other conditions that might interact with pain medication.

Pain Control without Medicine

- **Distraction** will help your child focus on other activities instead of their pain. Reading to your child, playing quiet games, or other engaging activities can help them cope with mild pain and anxiety.
- Helping your child think of **other pleasant thoughts** may also distract them from the pain or discomfort. Ask your child to close their eyes and imagine a beautiful place or feeling they have seen or experienced.



OTHER INSTRUCTIONS:

FOLLOW-UP APPOINTMENTS

WHO:

DATE:

PHONE:

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

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

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).

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.

REFERENCES

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.

1. O'Neill, 2013, Umbilical Hernia. In Principles of Pediatric Surgery. Retrieved from <http://www.pediatricsurgerymd.org>.
2. Muschawec U, in Umbilical and epigastric hernia repair, *Surgical Clinics of North America*. 2003;83:1207-1221.
3. Meier De, OlaOlorun DA, Omodele RA, Nkor Sk, Parpley JL. Incidence of umbilical hernia in African children; redefinition of "normal" and reevaluation of indications for repair. *World Journal of Surgery*. 2001;25:645-648.
4. Coran AG et al. *Pediatric Surgery*, 7th Ed. Vol. 2. Philadelphia, Saunders, 2012. p. 969.
5. Keshtgar AS, Griffiths M. Incarceration of umbilical hernia in children: is the trend increasing? *European Journal Pediatric Surgery* 2003;13:40-43.
6. Zendejas B, Kuchena A, Onkendi EO, Lohse CM, Moir CR, Ishitani MB, Potter DD, Farley DR, Zarroug AE. Fifty-three-year experience with pediatric umbilical hernia repairs. *Journal of Pediatric Surgery*. 2011;46(11):2156.
7. Hirose S, Lee H, Mackenzie T, Miniati D, Harrison MR, (2012, Dec. 20)Umbilical Hernia retrieved from <http://pedsurg.ucsf.edu>.
8. Cravero JP, Blike GT, Beach M, Gallagher SM, Hertzog JH, Havidich JE, Gelman B. Incidence and nature of adverse events during pediatric sedation. *Pediatrics*. 2006;118:1087-1096. Doi: 10.1542/peds.2006-0313.
9. Chirdan LB, Uba AF, Kidmas AT. Incarcerated Umbilical Hernia in Children. *Journal of Pediatric Surgery*. 2006;16:45-48.
10. American Society of Anesthesiologists. Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: Application to healthy patients undergoing elective procedures. *Anesthesiology*. 2011;114:500.

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.

We are grateful to Ethicon Endo-Surgery for the educational grant to the American College of Surgeons Foundation in support of the Division of Surgical Patient Education Program Hernia Brochures.

Reviewed by: Nancy Strand, RN, MPH
Marshall Z. Schwartz, MD, FACS
Mary E. Fallat, MD, FACS

Reviewed April 2013