

# Pediatric Hernia

## Inguinal and Femoral Repair



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### Inguinal Hernia Location



A hernia is strangulated if the intestine is trapped in the hernia pouch and the blood supply to the intestine is decreased. This may cause sharp abdominal pain and vomiting and is a surgical emergency requiring immediate treatment.<sup>2</sup>

The hernia sac may sometimes contain intestine or abdominal tissue that can be pushed back into the abdomen. This means the hernia is **reducible**. If the tissue cannot be pushed back in, the hernia is **irreducible** or **incarcerated**.<sup>3</sup>

### Recognizing Hernias in children

- Inguinal hernias occur in 6 of 100 boys, less than 1 in 100 girls, and in up to 30 of 100 premature infants<sup>3</sup>
- 60 of 100 hernias occur on the right side.<sup>4</sup>
- Incarceration can occur in about 4 of 100 boys or girls and is twice as likely in premature infants.

**Other medical disorders** that have symptoms similar to hernias include: enlarged lymph nodes, cysts, and testicular problems such as scrotal hydrocele.<sup>5</sup>

### Expectations

**Before the operation**—Evaluation may include health history, home medications, and options for pain control.

**The day of the operation**—Your child will not eat or drink for several hours before the operation. 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 waiting area and recovery room.

### Common Tests

#### History and Physical Exam<sup>6</sup>

The site is checked for a bulge.

Sometimes, other tests may include (**see glossary**):

- Digital finger exam
- Blood tests
- Urinalysis
- Ultrasound if the hernia is difficult to see or feel<sup>6</sup>

### Benefits and Risks of Your Child's Operation

**Benefits**—An operation is the only way to repair a hernia. Your child can return to normal activities in a short amount of time.

**Rare 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 the groin area.

**Risks of not having an operation**—The hernia may cause pain and can increase in size. The intestine may become incarcerated (trapped) in the hernia pouch or strangulated, causing reduced blood supply to the testes in boys.

### The Condition

A hernia occurs when tissue bulges out through an opening in the muscles. 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
- Burning or pressure at the hernia site

### Types of Hernias

There are two types of groin hernias:

**Inguinal hernias** are the most common type of all hernias. They appear as a bulge in the groin or scrotum of boys or labia majora of girls. They are more common in boys.

**Femoral hernias** appear as a bulge in the groin, upper thigh, or labia (skin folds surrounding the vaginal opening). They are more common in girls and are always repaired because of a high risk of strangulation.<sup>1</sup>

### Keeping You Informed

#### Undescended testicles

In males, the testicles move (descend) from the abdomen into the scrotum. The testicle remains in the abdomen in 4 of 100 full-term infants and 30 of 100 premature infants. In about half of babies, the testicle descends into the scrotum by 6 months. In rare cases, failure to replace the testicles back in the scrotum during hernia can occur.<sup>7</sup>

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# Surgical and Nonsurgical Treatment

SAMPLE

## Surgical Treatment

Inguinal hernia repair is performed in 4 of 100 children and is the most common pediatric surgery.<sup>8</sup> Repair of an inguinal hernia is always recommended in children. Premature infants may be operated on before leaving the neonatal intensive care unit (NICU) because the risk of the hernia becoming incarcerated is greatest in early infancy.<sup>3</sup>

### Open Repair



### Open Hernia Repair

The open suture (sewn) repair is done most often in young children. The surgeon makes an incision above the hernia site, and the sac protruding through the gap in the muscles is tied off. An open repair can be done with local anesthesia. Pediatric repair is usually done as an open repair without mesh. Mesh may be used to repair hernias in older children and teenagers.<sup>9</sup> If needed, orchiopexy (moving an undescended testicle down into the scrotum) will be done with the hernia repair.<sup>10</sup>

### Laparoscopic Repair

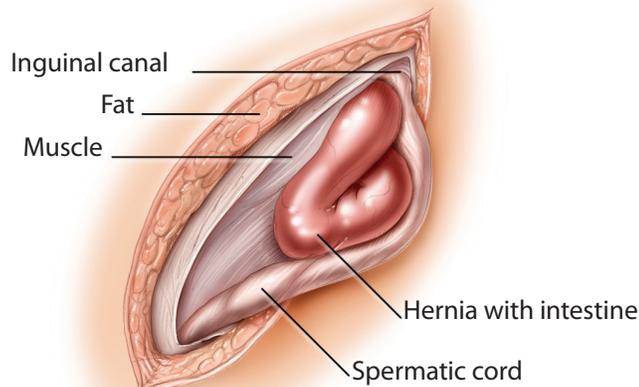


### Laparoscopic Hernia Repair

The surgeon inserts small ports (hollow tubes) through punctures or small incisions in the abdomen. The abdomen is inflated with carbon dioxide gas to make it easier for the surgeon to see the internal organs. Surgical tools and a light are placed into the ports. The muscle at the hernia site is sutured together. The surgical incision size is reduced, and the other side of the groin can be inspected for a potential hernia.<sup>11</sup>

The recurrence rate is the same as the open repair.<sup>4</sup> A single port may be used. The complication rate and recurrence rate is the same as an open procedure. Single port has the advantages of preventing a contralateral (opposite side) hernia and leaves a less visible scar.<sup>12</sup>

### Open Hernia Repair



## Nonsurgical Treatment

**Watchful waiting** is not recommended because of the high risk of incarceration, especially in young infants.<sup>3</sup>

## 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.

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, a history of premature birth, nausea, or vomiting. All hospitals allow a parent to stay the night in a room with their child.

## When to Contact Your Child's Surgeon

Contact your child's 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 their wound site
- Strong or continuous abdominal pain or swelling of their abdomen
- No bowel movement 2 to 3 days after the operation



Left front view of a girl with an inguinal hernia



Right front view of a boy with an inguinal hernia

# Risks of This Procedure

RISKS	WHAT CAN HAPPEN	KEEPING YOU INFORMED
<b>Long-term pain</b>	5 of 100 children reported chronic pain 3 years after inguinal hernia repair. <sup>13</sup>	Pain is usually managed with acetaminophen or ibuprofen, and most children resume normal activity in a few days.
<b>Recurrence (hernia comes back)</b>	Inguinal hernia reoccurs in less than 1 of 100 children who have had a repair. Most recurrences are seen within one year of the original repair. <sup>14</sup>	The recurrence rate of 1 of 100 children for an inguinal hernia after laparoscopic surgery is comparable to that of the traditional open approach. <sup>15</sup>
<b>Testicular atrophy (injury)</b>	A strangulated or incarcerated hernia can result in a loss of blood supply to the testicles and is reported in less than 2 of 100 cases. <sup>16</sup>	Testicular damage is reported only in cases of strangulation and incarceration.
<b>Testicular or scrotal pain/swelling</b>	Fluid may accumulate in the scrotal sac (Hydrocele) in less than 2 of 100 repairs. <sup>11</sup>	Scrotal swelling after pediatric inguinal hernia repair usually resolves on its own. <sup>13</sup>
<b>Injury to the vas deferens</b>	The vas deferens carries the sperm from the scrotal area to the penis. During hernia repair, it may be damaged. This may not be recognized until adulthood. It is reported in less than 1 of 100 repairs. <sup>4</sup>	Injury to the vas deferens during hernia repair in childhood may be a reason for infertility in men. Rare cases of infertility are caused by the use of mesh. <sup>2</sup>
<b>Infection</b>	Pediatric wound infection after inguinal repair is reported in less than 2 of 100 cases. <sup>4</sup>	Antibiotics are typically not given for inguinal or femoral hernia repair unless mesh is used.
<b>Injury to internal organs—bowel, bladder, blood vessels</b>	Injury can be caused by instruments inserted with laparoscopic repair. Injury to the intestine, bladder, kidneys, nerves, blood vessels leading to the legs, internal female organs, or vas deferens is extremely rare. <sup>17</sup>	For bladder injury, a Foley catheter remains in place to drain the urine until the bladder is healed. Rarely surgical repair is needed. For bowel injury, the bowel is repaired and/or a nasogastric tube is placed to keep the stomach empty. Any injury to a blood vessel is repaired.
<b>Anesthesia</b>	Anesthesia complications are extremely rare. Premature newborns or infants less than 1 year old have the greatest risk of complications from general anesthesia. <sup>18</sup> Children can expect to resume normal activity 48 hours after surgery.	Most hernias are repaired on an outpatient basis. An overnight stay is usual for full-term infants less than 3 months old. <sup>18</sup> Local spinal anesthesia or spinal nerve block may be used in premature infants less than 36 weeks old. This can decrease the need for other pain medication after surgery. <sup>19</sup>
<b>Respiratory complications</b>	Apnea (periods of not breathing) right after the operation is seen in less than 5 of 100 premature infants. <sup>20</sup> Respiratory complications in healthy, full-term infants less than 1 month old are uncommon. <sup>20</sup>	Apnea is associated with premature infants who had a history of apnea and other medical problems before their hernia repair. <sup>20</sup>
<b>Heart/cardiac complications</b>	There are no reports of heart complications.	Your anesthesia provider will suggest the best anesthesia option for your child.
<b>Death</b>	No deaths are reported directly related to pediatric inguinal and femoral hernia repair.	The risks of complications are greater with strangulated and incarcerated hernia repairs. <sup>3</sup>

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

# Preparing for Your Child's Operation

## The Day of Your Operation

Follow these guidelines or those provided by your surgeon for when your child should stop eating or drinking.<sup>21</sup>

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

- Clean their abdomen and groin area with mild antibacterial soap.
- Brush their teeth and rinse their mouth with mouthwash.
- Do not shave the surgical site; the surgical team will clip the hair near the incision if necessary.

## 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

### 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.<sup>5</sup> 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.

#### Revised July 2019 by:

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## Recovery and Discharge

Your child will be moved to a recovery room. Their heart rate, breathing, oxygen saturation, and blood pressure will be closely watched. All visitors must wash their hands.

### Thinking Clearly

If general anesthesia is given, some children may feel upset or confused as anesthesia is wearing off. Your child may need more sleep than usual on their first day at home.

### 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. They may have nausea or vomiting from the anesthesia.

### Activity

- Your child will slowly increase their activity. If old enough, they should get up and walk every hour or so to prevent breathing problems and constipation.
- There is no lifting, climbing, or strenuous physical activity for several weeks.
- Children can usually return to normal activities and school within a few days.

### Wound Care

- **Always wash your hands** before and after touching near the incision site.
- Your child may have Steri-Strips® or clear wound adhesive placed over their incision site. The strips and adhesive will fall off in 7 to 10 days.
- Your child may shower or bathe after 1 to 2 days but avoid prolonged soaking.
- A small amount of drainage from the incision is normal. If the dressing is soaked with blood, call your surgeon.
- Keep your child in loose clothing. This will prevent rubbing against their incision.
- Protect their newly healed skin from the sun because the skin can burn and cause darker scarring.
- Their incision will heal in 4 to 6 weeks and will become softer and continue to fade over a year. Visit [facs.org/woundcare](https://www.facs.org/woundcare) for more information about wound care.

### Bowel Movements

Call your surgeon if your child does not return to their normal bowel habits.

## Pain Control

Most children have little to no pain after the repair of an inguinal hernia.

### With Medicine

- **Children's acetaminophen (Tylenol) or ibuprofen** can be used to relieve pain, with most children needing only 1 to 2 doses.
- **Throat lozenges or popsicles** can also relieve sore throat pain or dryness from the tube placed in the throat during anesthesia.

### Without Medicine

- **Distraction** will help your child focus on other activities instead of their pain. Reading to your child, playing quiet games, or playing music can help them cope with mild pain and anxiety.
- **Imagery** will help your child think of other pleasant thoughts and may also distract them from pain or discomfort.

## 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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