PROCEDURE

Congenital diaphragmatic hernia repair

Surgery that closes a birth defect in the diaphragm and returns organs to the abdomen.

PURPOSE
Close the diaphragm and return organs to the abdomen

PROCEDURE TYPE
Therapeutic surgery, open or minimally invasive

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General anaesthesia

HOW LONG IT TAKES
Often 2 to 4 hours, based on defect complexity

PREPARATION
Stabilisation, fasting, blood tests, and medicine review

RECOVERY
Hospital days to weeks; adults drive only after clearance

MAIN RISKS
Bleeding, infection, organ injury, and hernia recurrence

RESULTS
Repair confirmed immediately; lung and feeding progress take longer

Overview

Congenital diaphragmatic hernia repair closes an opening in the diaphragm that has been present since birth. The diaphragm is the muscle separating the chest from the abdomen.

The opening can allow the bowel, stomach, spleen, or liver to enter the chest. Surgery returns these organs to the abdomen and repairs the diaphragm.

Most repairs occur during the newborn period, although smaller defects may not be found until childhood or adulthood. In newborns, surgery is usually delayed until breathing, circulation, and pulmonary hypertension are stable enough for an operation.

Why the procedure is performed

Repair creates a barrier between the chest and abdomen, keeps abdominal organs in place, and gives the lung more room. It can also prevent bowel blockage, twisting, or trapping.

The operation closes the diaphragm but does not immediately correct underdeveloped lungs. Breathing problems may continue after a successful repair, especially in severely affected newborns.

Who should and should not have it

Repair is generally recommended when a congenital diaphragmatic hernia allows organs to enter the chest. Timing depends on breathing, blood pressure, pulmonary hypertension, and overall health.

A critically unwell newborn may first need a ventilator, medicines, or extracorporeal membrane oxygenation (ECMO). ECMO temporarily supports the heart and lungs but does not repair the diaphragm.

Surgery may be delayed or reconsidered when:

A small defect found unexpectedly in an older person needs specialist review. Immediate repair may not be necessary if there are no symptoms, trapped organs, or other urgent concerns.

- Breathing, oxygen levels, or blood pressure remain unstable
- Severe pulmonary hypertension is uncontrolled
- There is an untreated infection or another urgent medical problem
- Other major conditions limit the likely benefit
- The family and clinical team choose comfort-focused care because surgery is unlikely to meet agreed goals

How to prepare

For a newborn, preparation focuses on stabilising breathing and circulation. Feeding is usually stopped, with fluids and nutrition given through a vein. A tube may be placed through the nose or mouth to remove air and fluid from the stomach.

Tests may include blood tests, chest imaging, heart ultrasound, and continuous monitoring. Tell the team about medicines, allergies, previous operations, bleeding problems, and recent illness.

Older children and adults must follow instructions about when to stop eating and drinking. Tell the team about all medicines and supplements, especially blood thinners like warfarin or apixaban . Do not stop prescribed medicine unless instructed.

The treating facility's fasting and medicine instructions take priority because plans are tailored to the patient and anaesthetic.

What happens during the procedure

General anaesthesia keeps the patient unconscious and free of pain. A breathing tube and ventilator support breathing.

The surgeon uses one of these approaches:

Open surgery is often used for large defects, unstable newborns, or when more working space is needed. Minimally invasive repair may suit selected stable patients but can have a higher recurrence risk in some groups.

The surgeon moves the organs back into the abdomen. A small opening is closed with stitches. A larger one may require a synthetic patch or nearby muscle or tissue.

A chest drain may be placed to remove air or fluid. After the incisions are closed, the patient returns to intensive care or a recovery area.

- Open repair: An incision is made in the abdomen or, less often, the chest
- Minimally invasive repair: A camera and instruments are inserted through several small incisions

Recovery and what to expect afterward

Pain: Pain medicine is given regularly at first. For newborns, staff assess facial expression, movement, heart rate, and comfort. Older patients may have chest or abdominal soreness.

Eating: Feeding resumes when breathing and bowel function allow. Newborns may initially receive nutrition through a vein or feeding tube. Reflux, tiredness, or difficulty coordinating sucking, swallowing, and breathing can delay oral feeding.

Activity: Movement increases gradually. Older children and adults should avoid heavy lifting, contact sports, and strenuous activity until the surgeon confirms healing.

Driving: Use recommended child restraints for infants and children. Adults must not drive while taking sedating pain medicine or until they can move and brake safely and have received clearance.

Returning to work or school: Return is gradual and depends on breathing, nutrition, pain, and the type of repair. Ask the team for an individual plan.

A newborn may remain in intensive care for days or weeks. Length of stay depends mainly on lung development, pulmonary hypertension, feeding, and other medical needs.

Risks and possible complications

Possible surgical and anaesthetic complications include:

Reflux, feeding difficulty, slow growth, chest shape changes, and breathing problems may continue because of the original condition as well as the operation.

Large defects and patch repairs require close long-term monitoring because recurrence can occur months or years later.

- Bleeding or infection
- Injury to the lung, bowel, spleen, liver, or nearby structures
- Air or fluid around the lung
- Problems related to anaesthesia or ventilation
- Poor healing of the wound or patch
- Recurrence of the opening
- Scar tissue causing later bowel blockage

Results and follow up

The surgeon can usually confirm during the operation that the organs have been returned and the opening closed. Breathing and feeding may improve gradually.

Follow-up may assess:

Chest imaging or other tests may be scheduled to check for recurrence. Keep all routine appointments even when recovery appears to be going well.

- Breathing, oxygen needs, and pulmonary hypertension
- Growth, feeding, and reflux
- Hearing and development
- Chest shape and spinal alignment

- The position and strength of the repair

Alternatives

No medicine can close a congenital opening in the diaphragm.

Observation may sometimes be considered for a very small defect found incidentally in an older person without symptoms. This avoids immediate surgery but leaves a risk that organs could later enter the chest or become trapped. A specialist should explain the trade-off.

Ventilation, pulmonary hypertension medicine, and ECMO may stabilise a newborn but do not repair the diaphragm.

Fetoscopic endoluminal tracheal occlusion (FETO) may be offered before birth in selected severe cases at specialist centres. It aims to encourage lung growth, carries pregnancy-related risks, and does not replace surgery after birth.

Comfort-focused care may be considered when severe lung disease or other conditions make meaningful benefit unlikely. This decision should reflect the family's goals and a clear discussion of expected outcomes.

When to call your healthcare team

Contact the surgical or neonatal team promptly for fever, increasing wound redness, swelling or drainage, worsening pain, repeated vomiting, a swollen abdomen, reduced feeding, fewer wet diapers, or a new breathing change.

Seek emergency help for severe difficulty breathing, blue or grey lips or skin, collapse, unresponsiveness, choking with coughing or vomiting, or sudden severe chest or abdominal pain.

Discuss non-urgent questions about feeding, reflux, activity, medicines, growth, or imaging during routine follow-up.

Common questions

Will I or my baby be asleep?

Yes. General anaesthesia is used, with a breathing tube and ventilator during surgery.

Can I drive home afterward?

Newborns usually remain in hospital. Adults need someone else to drive them home and must wait for clearance before driving again.

How painful is the repair?

Incision pain is expected, especially during the first few days. The team provides and adjusts pain relief using comfort signs or pain scores.

When will I know whether it worked?

The surgeon knows immediately whether the opening was closed. Breathing, feeding, and growth outcomes become clearer over days, weeks, and longer follow-up.

Can the hernia come back?

Yes. Recurrence is more likely after a large defect or patch repair. Follow-up and scheduled imaging help detect it.

Will breathing be normal after surgery?

Not always immediately. Repair creates space for the lung but does not instantly reverse lung underdevelopment or pulmonary hypertension. Some children need prolonged breathing support and long-term lung follow-up.

Sources

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