CONDITION

Pneumothorax - infants

A pneumothorax is trapped air around an infant's lung that can make the lung partly or fully collapse.

WHAT IT IS
Air around a lung causing partial or complete collapse

BODY SYSTEM
Lungs and breathing

MAIN SYMPTOMS
Fast breathing, grunting, blue-grey skin, sudden deterioration

WHAT CAUSES IT
Air leaking from fragile, diseased, or pressure-supported lungs

HOW IT IS DIAGNOSED
Chest X-ray or bedside lung ultrasound

MAIN TREATMENT
Monitoring, breathing support, or drainage of trapped air

CAN IT BE CURED?
Yes - most air leaks seal

IS IT AN EMERGENCY?
Sometimes - severe breathing difficulty or blue-grey skin

LONG-TERM OUTLOOK
Usually full recovery after an isolated air leak

Overview

A pneumothorax happens when air escapes from a lung and collects in the space between the lung and chest wall. This air can press on the lung, preventing it from expanding normally. The lung may be partly or, less often, fully collapsed.

In infants, pneumothorax is most often seen during the newborn period. It can affect babies born at any stage of pregnancy, although the circumstances and likely effects differ between a healthy full-term baby and a very premature or unwell baby.

A small pneumothorax may cause no obvious problems and can disappear as the body absorbs the trapped air. A larger leak can interfere with breathing and reduce the amount of oxygen reaching the body.

A tension pneumothorax is the most serious form. Pressure continues to build in the chest, which can compress the lung, heart, and major blood vessels. This requires immediate treatment.

An isolated pneumothorax often heals completely. The overall outlook is also influenced by why the leak developed, how premature the baby is, and whether there is another lung or heart condition.

Symptoms

Symptoms can appear suddenly. In a baby already receiving hospital care, the first sign may be an unexpected change in oxygen levels, heart rate, or the amount of breathing support needed.

Possible signs include:

Small pneumothoraces do not always cause symptoms. Some are found when a chest image is taken for another reason.

A tension pneumothorax may cause rapid worsening, severe breathing difficulty, low blood pressure, poor circulation, or collapse. In newborns, these signs can resemble other serious breathing or heart problems, so urgent assessment is needed rather than trying to identify the cause at home.

- Breathing faster or working harder to breathe
- Grunting noises with each breath
- Nostrils widening during breathing
- Skin pulling in between or below the ribs
- Uneven chest movement
- Pale, blue, or grey lips and skin
- Irritability, unusual sleepiness, or poor feeding
- A sudden fall in oxygen levels
- A slow or unusually fast heart rate

Causes and risk factors

A pneumothorax begins with a leak from tiny air sacs or airways inside the lung. Air then moves into the space around the lung.

Some newborns develop a spontaneous air leak while taking their first breaths. The pressure needed to open fluid-filled lungs after birth can occasionally rupture a small air sac. This can happen without an underlying illness.

The risk is higher when a baby's lungs are fragile or difficult to inflate. Relevant conditions and circumstances include:

Breathing support can be lifesaving. However, pressure used to open the lungs can sometimes contribute to an air leak, particularly when the lungs are already stiff or damaged. Clinical teams use the lowest effective pressures and monitor babies closely.

In older infants, less common causes include chest injury, severe lung infection, an airway blockage, an underlying lung abnormality, or a medical procedure involving the chest. Sometimes no clear cause is found.

A pneumothorax is not caused by ordinary crying, feeding, holding, or changing a baby.

- Premature birth, especially when the lungs are underdeveloped
- Respiratory distress syndrome, caused by too little of the substance that keeps air sacs open
- Meconium aspiration, when a baby breathes stool-contaminated fluid into the lungs around birth
- Pneumonia or another serious lung infection
- Congenital lung abnormalities present from birth
- Breathing support using continuous positive airway pressure, known as CPAP
- Mechanical ventilation through a breathing tube
- Resuscitation that requires pressure to inflate the lungs

Diagnosis

The healthcare team first examines the baby's breathing, chest movement, heart rate, circulation, and oxygen level. Breath sounds may be quieter on the affected side, but examination alone cannot reliably confirm a small pneumothorax.

A chest X-ray can show air outside the lung and how much the lung has collapsed. In many neonatal units, bedside lung ultrasound can also confirm the diagnosis quickly without moving the baby.

In a possible emergency, a bright light placed against the chest may sometimes reveal an unusually bright area caused by trapped air. This technique, called transillumination, is mainly a

rapid bedside aid in very small babies. It is less reliable than imaging.

If a baby is deteriorating and a tension pneumothorax is strongly suspected, treatment may begin before an X-ray. Waiting for imaging in that situation could delay relief of dangerous pressure.

The team may also investigate the cause. Tests can include blood tests, blood gas measurements to assess oxygen and carbon dioxide, infection testing, or further imaging for a suspected lung abnormality.

Treatment and management

Treatment is based on the size of the pneumothorax, the baby's symptoms, oxygen levels, gestational age, and need for breathing support.

A small pneumothorax in a comfortable, stable baby may only need close monitoring. The body can gradually absorb the trapped air while the leak seals. Staff may repeat examinations and imaging to confirm that it is not getting larger.

Oxygen is given when a baby needs it to maintain a safe oxygen level. Routine use of very high oxygen levels simply to make the air disappear faster is not appropriate for every infant. Too much oxygen can be harmful, particularly for premature babies, so the amount is carefully controlled.

A baby with a larger or symptomatic pneumothorax may need the air removed. Options include:

Pain relief and comfort measures are provided for chest procedures. A chest drain is secured and monitored until the leak has stopped and imaging shows that the lung remains expanded. It can then be removed.

Babies may also need treatment for the underlying problem, such as infection or respiratory distress syndrome. If a baby is receiving CPAP or mechanical ventilation, the clinical team may adjust the pressure while still providing enough breathing support.

Surgery is rarely needed. It may be considered when an air leak continues despite drainage, repeatedly returns, or is linked to a structural lung problem.

- Needle aspiration: A needle or small catheter is inserted through the chest wall to release trapped air.
- Chest drain: A flexible tube is placed between the ribs and left in position to drain air while the lung heals.

- Emergency decompression: Air is released immediately when tension pneumothorax is causing severe breathing or circulation problems.

Complications

A large pneumothorax can reduce oxygen delivery to the brain and other organs. A tension pneumothorax can also restrict blood flow back to the heart, causing poor circulation and collapse.

Other possible complications include:

Complications are more likely when a baby is very premature, seriously unwell, or has significant lung disease. In many babies with an isolated, promptly treated pneumothorax, there is no lasting lung damage.

- A continuing or repeated air leak
- Air leaking into other parts of the chest or body
- Infection, bleeding, or injury related to drainage
- Ongoing breathing problems from the underlying lung condition

Prevention

A pneumothorax cannot always be prevented. A spontaneous leak may occur during a newborn's first breaths even when pregnancy, birth, and care have gone as expected. Parents do not cause this.

When breathing support is needed, neonatal teams monitor airway pressures, oxygen levels, and the baby's response. Using appropriate ventilation settings may reduce pressure-related lung injury, but it cannot remove the risk entirely from fragile lungs.

Keeping an infant away from tobacco smoke and vaping aerosols supports lung health, although it cannot guarantee that a pneumothorax will not occur. Correct use of a rear-facing car seat and a safe home environment can reduce the risk of chest injury.

There is no routine medicine, diet, or activity that parents can use to prevent a spontaneous newborn pneumothorax.

Living with it and what to expect

A small air leak may resolve over hours to days. A pneumothorax that requires drainage can take longer, especially if the lung is affected by prematurity, infection, or another condition.

During hospital care, monitoring continues until the baby is breathing comfortably, has stable oxygen levels, and no longer has a significant collection of air. Feeding and holding may be paused or adapted when breathing is difficult or a chest drain is present. Staff can help you touch, comfort, and, when safe, hold your baby.

After an isolated pneumothorax has healed, many infants need no special long-term treatment. Normal feeding, tummy time, and age-appropriate activity can usually resume after the care team confirms recovery.

Follow-up may be more involved for a premature baby or one with ongoing lung disease. Appointments may focus on breathing, growth, feeding, oxygen needs, and development rather than the healed air leak itself.

Recurrence is possible but not inevitable. A repeated pneumothorax may lead to tests for an underlying lung abnormality. The pneumothorax itself is not contagious and cannot be passed to other children.

When to get medical help

A newborn or young infant with new breathing difficulty needs prompt medical assessment.

Call emergency services now if your baby:

Do not drive a severely unwell baby yourself if emergency transport is available.

Seek urgent same-day medical care for persistent fast breathing, grunting, widening nostrils, reduced feeding, unusual sleepiness, or skin pulling in around the ribs. These signs have several possible causes and do not confirm pneumothorax, but they should be assessed.

After discharge, contact the baby's healthcare team routinely if you have questions about feeding, activity, follow-up imaging, travel, or the healing site from a chest drain. Routine follow-up is also appropriate when breathing is comfortable but mild concerns are not improving.

- Has blue, grey, or very pale lips or skin
- Is struggling to breathe or has pauses in breathing
- Is limp, difficult to wake, or unresponsive
- Suddenly deteriorates after a chest injury
- Has severe chest retractions or cannot feed because of breathing difficulty

Common questions

Can a baby fully recover from a pneumothorax?

Yes. Many babies recover fully once the leak seals and the trapped air is absorbed or drained. Recovery may take longer when the baby is premature or has another lung condition.

How long does a newborn pneumothorax take to heal?

A small leak can resolve within hours or a few days. A larger or continuing leak may require several days of drainage and monitoring. The underlying cause often affects the length of the hospital stay.

Will my baby have weak lungs afterward?

An isolated pneumothorax does not usually cause permanent weakness once the lung has re-expanded. Long-term breathing problems are more likely to reflect prematurity, infection, or existing lung disease rather than the air leak alone.

Can I hold or feed my baby during treatment?

Sometimes. It depends on breathing stability and whether a chest drain or breathing equipment is in place. Staff can help position your baby safely. If feeding is temporarily unsafe, nutrition can be provided in another way.

Can pneumothorax happen again?

It can recur, but one episode does not mean another will happen. Repeated episodes may prompt imaging or specialist assessment for an underlying lung problem.

Can my baby fly after a pneumothorax?

Air travel should wait until the pneumothorax has completely resolved and the baby's healthcare team has confirmed that flying is safe. Cabin pressure changes can expand trapped air that remains in the chest.

Sources

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