

Complex Chest Injuries

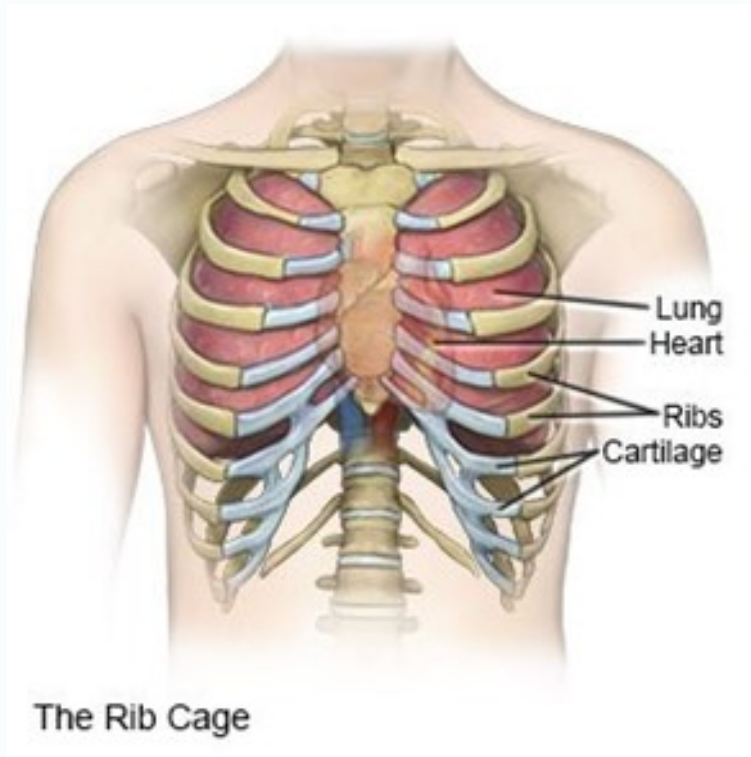
Fractures of the Ribs with either Pneumothorax or Haemothorax

This information was compiled by
Trauma Services, Auckland City Hospital

August 2021



The human rib cage is of the part respiratory (breathing) system & covers the chest (or thoracic) area. The rib cage is flexible, moving up & down when you are breathing & is a strong frame onto which the muscles of the shoulder, chest, upper abdomen & back attach. It protects the lungs, heart, & large blood vessels underneath. Other vital organs under the rib cage are the liver, gallbladder, spleen, kidneys, stomach, pancreas & parts of the bowel.



The bones of the rib cage are the 12 **bones of the thoracic spine**, the **sternum** (breast bone) & 12 pairs of flat curved bones called **ribs**. The ribs are numbered 1 to 12, from the top to the bottom of the chest.

REST..... PAIN MEDICINE.....ACTIVITY.....REST

You may feel quite tired when you first go home—plan a rest time during the day if that helps. Please keep doing the deep breathing & coughing exercises that you have been shown while you were in hospital.

Going for a walk each day is the best way to increase your ability to breath deeply & help prevent complications.



Some other suggestions:

Use extra pillows for comfort when sleeping.

Avoid sudden movements such as : stretching, lifting, pulling, pushing, or standing for long periods

Eat well, drink plenty of water & exercise to help prevent you getting constipated while you are on painkillers.

If you get new shortness of breath, have rapid shallow breathing, chest pain & dizziness – Dial 111 for an Ambulance.

After leaving hospital

It is not unusual to experience more pain when you get home – you will be doing more normal activities rather than resting as you were in hospital. Discomfort from the injury will continue for some weeks but will steadily become less & less.

Take your pain medicines as prescribed.

SEE YOUR GP - within a week of discharge. They will monitor your progress & advise you on gradual reduction in pain medicines as you improve. The GP & ACC can assist you in your return to work or if needed, access further community supports.

If you had surgery for Rib Fixation or haemothorax removal, the Trauma service may arrange an Outpatient clinic a few weeks after your discharge. If needed a chest x-ray will be arranged for that time as well. You will be informed of this & the times to attend clinic.

DRIVING THE CAR- we advise you NOT to drive for at least 2-3 weeks after leaving hospital. Any sudden force of an emergency stop may cause increased pain & stops you from performing this safely. When you think you are ready, practise this in the driveway first to check.

SPORTS – NO high impact or physically active sports or activities are advised for at least 3 months. Ideally, you should be cleared by your GP for this.

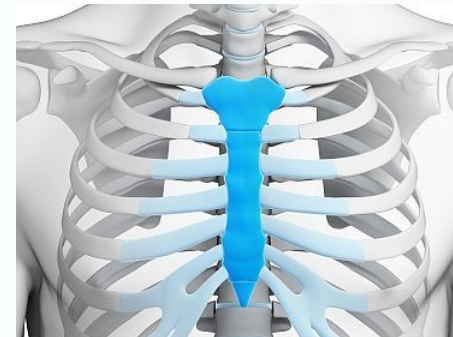
AIRLINE FLIGHTS – Most airlines have at least a 2 week No-fly rule after a pneumothorax or haemothorax is fully healed.

Please check your airline website for specific medical information.

In the front, cartilage tissue joins the upper ribs (No 1 - 7) to the sternum. Ribs 8-10, are more loosely attached & ribs 11 & 12 are only attached by cartilage to each other. At the back, all the ribs fit snugly against the spinal bones & are attached to the spine with ligaments. In between every rib on both sides are muscles, nerves & a blood supply.

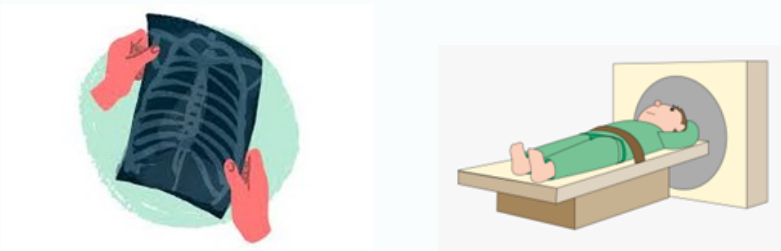


The **sternum** (or breast bone) is a flat bone between the ribs, just below the throat area & is made up of three parts called the manubrium, body & the xiphoid process. In the front of the chest the first ribs on both sides are attached to the manubrium. Both second ribs attach to where the manubrium & body join. Ribs 3 -7 attach onto the body section of the sternum.



Fractures of the Ribs or Sternum (or both)

A chest x-ray or chest CT scan will show if the ribs or sternum are broken.



A rib fracture is a break in one or more of the ribs in the rib cage. There may be one break in several ribs or many breaks in the same rib or a combination of these. The middle ribs are the ones most often broken.

Fractures can happen after a direct blow to the chest from: road crashes, a fall, assault, or crush injuries. The sternum can be either cracked or broken by a blow to the chest e.g from hitting the steering wheel or against a seat belt.

About 10% of all people who have fractures to their ribs will have broken more than one rib.

In people over the age of 65, a fall is the most common cause for an injury to the ribs.



Getting ready for discharge

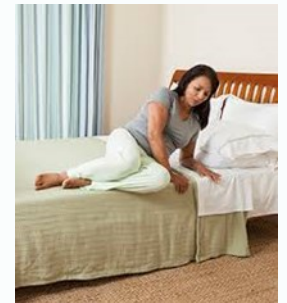
As your condition improves, the way you receive pain relief will gradually be adjusted so you are taking tablets which you can safely manage yourself at home.

Agreement on discharge between you & your medical team will be when:

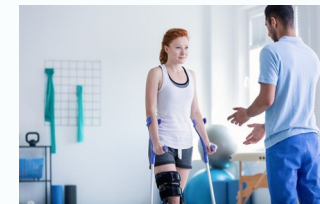
You are on a stable amount of pain medicine taken by mouth.



You can get in & out of a flat bed comfortably & on your own



You are walking short distances on the ward regularly without help



You can manage your own personal hygiene



Health care team members who may be involved in your hospital care

Nursing & Medical staff – will monitor you & support your recovery & arrange any investigations (x-rays &/or blood tests).

Trauma Nurse Specialist— will ensure your care is co-ordinated, especially if you have other injuries. They can give you & your whanau extra advice while in hospital, assist in planning for a safe discharge & support you need with any initial ACC queries.

Acute Pain service – can assist in managing your pain if needed.

Physiotherapist – to assess & monitor your progress with deep breathing & coughing exercises, to assist with mobility to prevent complications & enhance your recovery.

Occupational Therapist—to monitor your recovery if you hit your head, to ensure you are safe for discharge & provide any equipment you might need at home.

Social worker – available for support, arranging community support services & counselling should you require them. Please ask.

Maori & Pacifica support —please ask if you wish this service to visit

Older Persons Health doctor—will visit you if you are 75 years or over

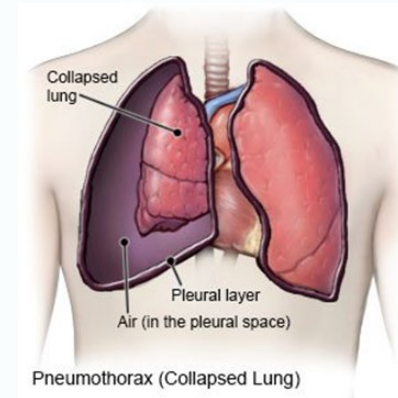
Health Psychologist— available for counselling. Please ask the ward staff if you need this service.

If you have any questions—Please ask our team

Pneumothorax

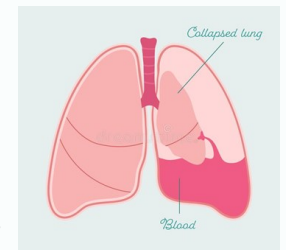
This is the medical term for a collapsed lung. It happens when air enters the space around your lungs (pleural space). Air gets into the pleural space when there is a hole in the lungs protective lining e.g caused by a broken rib, a sharp object, or the chest being squeezed really hard.

A pneumothorax interferes with the pressure that keeps your lungs inflated when you breathe in. It can lower your oxygen levels & your ability to breathe properly.



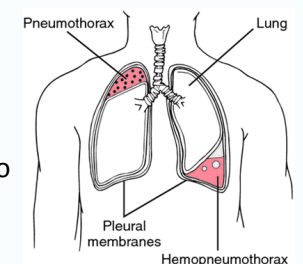
Haemothorax

This is the medical term for blood in the pleural space. Mostly, this is from rib fractures causing a lung tear (laceration) but it may also be from a blow to the chest. e.g car crash or fall. The bleeding usually stops on its own. This blood interferes with normal breathing by limiting how much the lung can stretch to take in a deep breath. Because blood is heavier than air it will move to the lower part of the lung.



Haemo-pneumothorax

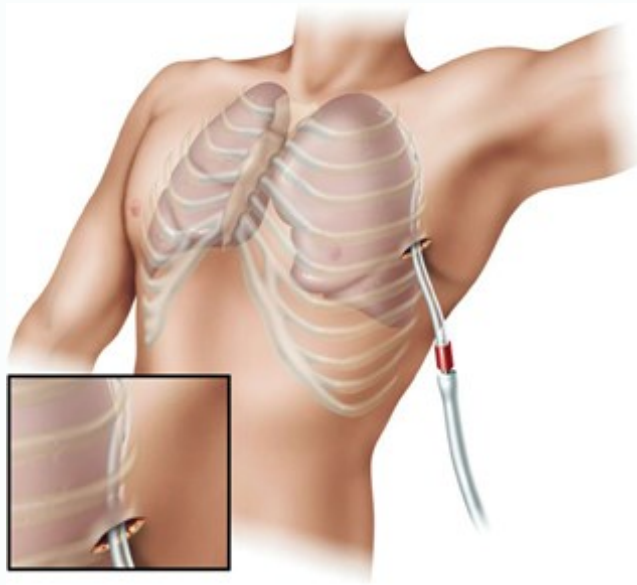
Some injuries to the lung & ribs cause both air & blood to be inside the pleural space around your lungs.



Treatment.

There are several immediate treatments you *may* require:

- ◆ Oxygen: Till your oxygen levels return to normal
- ◆ Pain relief: Medicines given IV & by mouth to help you to be as comfortable as possible. *See more information on this later.*
- ◆ A chest drain: If you have a pneumothorax or a haemothorax that needs urgent drainage, this will be discussed with you. After getting some local anaesthetic, a tube is inserted through your chest wall into the pleural space of the affected lung. The drain does not go into your lung itself. The drain is stitched in place & attached to a drainage tube & bottle. It allows any air or blood to drain out. Nurses will monitor how much comes out.



The main goal of your treatment is to be pain-free enough, so that you can cough, deep breathe, move comfortably, to prevent any complications.

Chest infections are avoidable.

The ability to move & keep moving is very important.

Getting out of bed & walking as soon as possible, is vital. This may also depend on whether other injuries are present or not.

But if you are able to, go for a walk 2 or 3 times a day.

This goal is achieved by you & your hospital team, with **regular pain relief**, medical & nursing care & physiotherapist help.

Breathing exercises

Practise this every 1-2 hours while you are awake, it will help you recover

Take a deep breath in—right to the bottom of your lungs

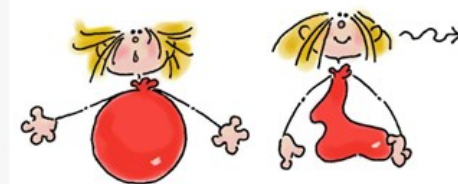
Hold your breath counting slowly to 3

And relax

Do this 10 times.

Then support your chest where it is sore & give a big cough.

If you can't take a deep breath or cough properly—you need more pain relief to help you to do so.



Breathe in

Breathe out

Pain control

Another way to control pain from broken ribs can be with a local anaesthetic given at a set rate through a special pump.

There are two main types: a Regional block or an Epidural.

A Regional block is a fine tube placed under the skin very close to the area where the ribs are broken. The pump is set to give a certain amount of local anaesthetic every few hours to numb the nerve ends.

An Epidural is local anaesthetic given through a fine tube placed near the spinal nerves. The pump is set to give a certain amount continuously to numb the nerve ends & reduce the pain.

Both a Regional block or an Epidural are put in by an Anaesthetist & will be discussed with you by the Acute Pain team, if this is the best treatment for your pain control.

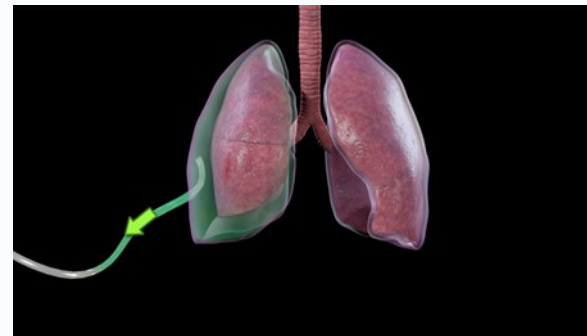


A combination of these may be used, or given on their own.
It will depend which suits you best.

Chest drain.....



The chest drain will be removed when the air & blood has stopped draining, usually between 1-3 days. Chest x-rays may be done both before or after the drain is removed. Any stitches remaining afterwards are removed about 7 days later.



Where the drain looks inside the chest



Drainage container

Other treatment which may be needed:

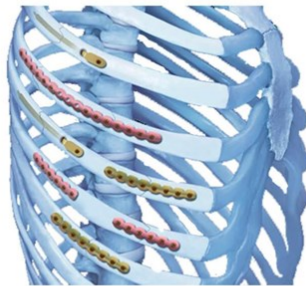
Heart monitoring:

This may be used if you have broken your sternum & have the possibility of a heart muscle bruise (contusion) or have a blood clot (haematoma) behind the broken area. This is so any abnormal heart beats can be picked up & treated early, should they occur.



Rib Fixation (or Plating) surgery:

In some patients where more severely broken ribs interfere with breathing & control of pain, a repair of the rib bones can be done. This is a planned operation & will be discussed with you, if this is the best option for your recovery. It is expected that you will be able to return to the ward afterwards, however some patients may need a short stay in the High Dependency unit. After surgery you can expect to have 1 or 2 chest drains & good pain relief to assist your recovery.



Removal of blood clot from around the lung

In some patients who have had many broken ribs for a reasonable time or who have a Haemothorax at the time of the injury, the blood in the lung does not get dissolved properly by the body & gets stuck at the base of the lung. This can lead to ongoing feelings of shortness of breath & is a risk for chest infection. The blood can be surgically removed with an operation. Often this is done at the same time as a Rib plating operation if that was needed.

This procedure would be discussed with you by the Trauma team.

Pain control in hospital

With fractured ribs or sternum, you will not really ever be completely pain free while in hospital. The aim is to be as comfortable as possible.

You will be given a variety of medicines to reduce the pain. Each works in a different way but also in combination with each other.

These are some examples:

- Regular medicine by mouth—to give a background level of pain control
- Medicine by mouth, **as you need it**. How often you have it is up to you. You will need to ask the nursing staff for *“extra pain relief” as soon as your pain starts to get worse*.
- If stronger pain relief is needed a PCA (Patient Controlled Analgesia) can be used. This is Intravenous (IV) medication controlled by you. You can then decide when & how often you need to use this.

