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Reflux and Swallowing Disorders

Oesophageal Anatomy and Function
Oesophageal Symptoms. Reflux, regurgitation, LPR, dysphagia
Obesity and reflux
Hiatus Hernia
Barrett's oesophagus
Achalasia
Laparoscopic Fundoplication
Laparoscopic Hiatus Hernia repair
Stretta therapy
Endoscopic R.A.P
Linx Antireflux
Heller Myotomy
Per Oral Endoscopic Myotomy

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About the author

Associate Professor Michael Talbot started working as a consultant upper gastrointestinal surgeon in 2003, having completed 10 years of training following his internship in 1992–93. He started performing complex upper GI surgery as a consultant in 2003 and was one of the first surgeons in Australia to perform laparoscopic gastric and oesophageal cancer surgery and complex surgery for weight-loss. He has had the longest-running oesophageal diagnostics lab in NSW and was the first to perform Robotic Upper GI, Bariatric and Upper GI Oncology procedures in Australasia.

Our practice offers expertise in reflux management, gallbladder and hernia surgery, repair of complex abdominal wall defects, endoscopic management of gallstones (ERCP), endoscopic oesophageal and gastric tumour therapy and state-of-the-art Barrett's oesophagus treatments. We have a specialised laboratory for the investigation of complex swallowing disorders and reflux and are involved extensively in research.

We work with other doctors and health professionals as part of an interdisciplinary team to create a work environment focused on patient care, innovation and excellence. Patients achieve better outcomes when they have a range of people helping to look after them. This booklet is a document that will change over time as we learn more from our patients and from each other.

Dr Gary Yee

Dr Jason Maani

Dr Jennifer Matthei

Essential information about this booklet

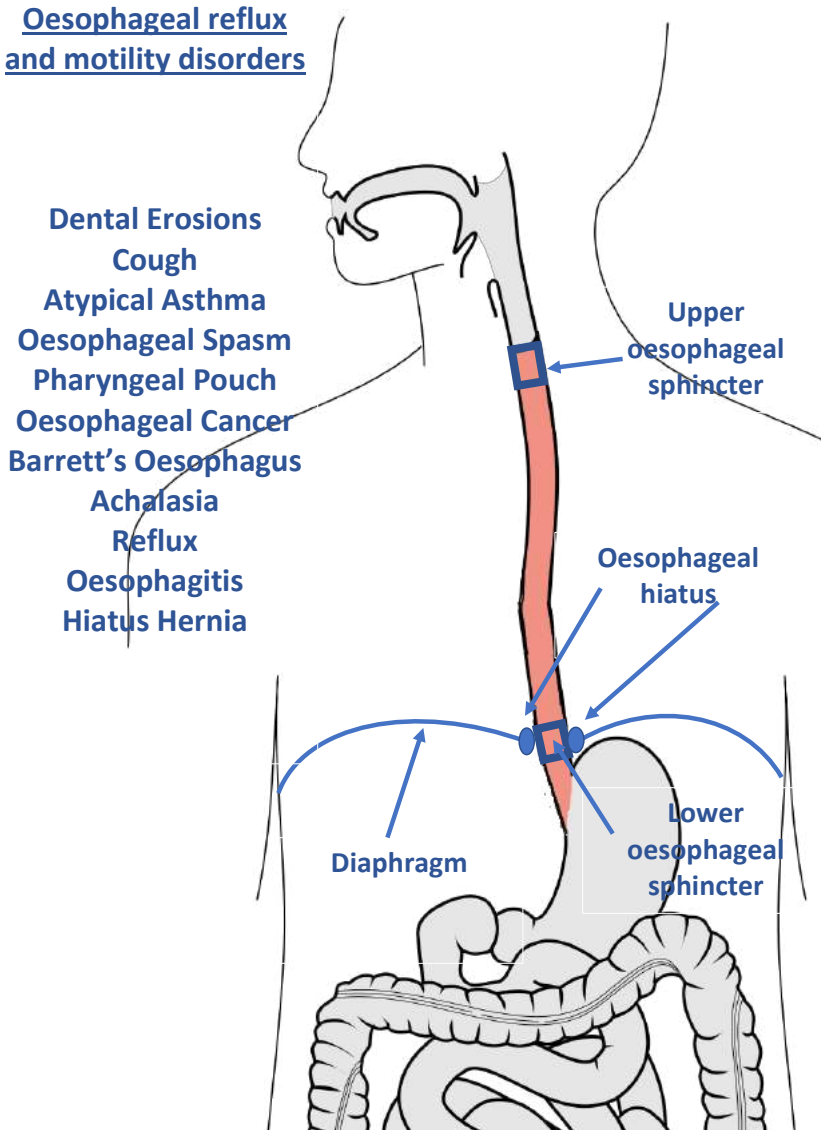
This booklet is intended to explain the Reflux and Swallowing Disorders procedure and any issues that you may have before and after different treatments. It is not supposed to replace advice given by your doctor or other healthcare professionals, but rather to add to it.

If you have any questions or worries that you wish to discuss with your doctor, please write them down in the space provided. It is important that you understand as much as possible before and after the operation, to aid your weight loss and ensure a healthy lifestyle.

The Oesophagus.

The oesophagus is like any part of our body, we don't really think about it until it starts to fail in its function. It is a thin muscular tube that is about 20 cm long, running from the back of the mouth, through the neck and chest (behind the heart and lungs), into the abdomen where it joins to the stomach.

The oesophagus functions like a rapid conveyor-belt, propelling food into the stomach which pulverises and liquifies it before its long journey through the small then long intestine for digestion and waste management. The stomach is one of the most toxic environments you can imagine, full of powerful acid and other chemicals that perform a useful function when they are contained in their rightful place, but cause trouble if they escape up the oesophagus. The oesophagus is lined by a delicate layer of skin that is almost identical to the skin of your forearm. If gastric content comes in contact with the oesophagus, it will irritate this delicate lining. As the oesophagus is quite narrow, trapped between the spine behind it and the heart and lungs in front, any condition that starts to block the oesophagus will lead to food getting stuck on the way down to the stomach. There are **three** main types of disorders that lead to oesophageal symptoms, one caused by stomach contents escaping to injure the oesophagus, throat and lungs (Reflux), one caused by the oesophagus failing to propel what we swallow to move properly (Dysphagia – difficulty swallowing), and another when the oesophageal muscle spasms and causes cramp-like chest pain (Chest pain). It is possible for people to have 1, 2 or 3 types of symptoms and this can make it hard to determine what underlying disorder is causing the problem when they seek treatment.



Anatomy of Oesophagus and disorders we commonly treat

Symptoms.

Reflux.

The term “Reflux” is used to describe what happens when **acid or other gastric content leaves the stomach and moves up the oesophagus**. When someone says they have “reflux” we ask them specific details about their symptoms to get a better idea of what they are experiencing, as may patients labelled as having reflux disease have other conditions. The symptoms that people with reflux experience can include:

1) Heartburn. This word is used to describe pain felt behind the lower breastbone that feels as if it has a “chemical” or “burning” component. Patients with this symptom often find that they can take medication or food/drink that will neutralise the discomfort they are feeling, and also that acidic foods as well as chocolate, alcohol, spicy food and large meals can trigger their symptoms.

2) Regurgitation. This occurs when people feel food or fluid move back up their oesophagus, and it’s quite different from vomiting. Patients may feel fluid that washes up their oesophagus when they bend forwards, some get burning sensations high up in their chest when they lay down or go to sleep, and some report waking up with acidic fluid in their mouth at night or staining their pillow. At its worst, regurgitation can lead to episodes of choking when people wake up unable to breath. If regurgitated fluid gets into the lungs it can cause pneumonia.

3) Epigastric pain. Patients often struggle to describe this symptom. When pain occurs at the point where the breast-bone meets the abdomen is often hard to figure out where it is exactly. This type of pain occurs commonly in patients with reflux, gastric or duodenal ulcers and gallstones so it can create quite a dilemma for patients and their Doctors.

4) Chest Pain. This pain is often associated with a feeling of food or liquids getting stuck, chest tightness or pain in the jaw, back, or left arm. Sometimes it occurs when people eat or drink, and sometimes it happens in between meals. Feeling anxious or stressed can make it occur more frequently. This pain is often interpreted and cardiac or heart pain because the nerves that cause the pain also supply the heart. It is believed that this pain is caused by oesophageal spasm. Oesophageal spasm can occur if the oesophagus is irritated by acid, if food gets stuck when we eat or drink and when the oesophagus spontaneously spasms (cramps) as part of a disorder in its function.

5) Cough. Repetitive coughing can be a symptom of reflux when acid or other toxic chemicals escape out of the stomach and irritate the larynx (voice box). Some patients are hypersensitive to these irritants in the same way that some people are intolerant to dust or chemicals in the air. Cough can also occur as a reflex triggered by chemicals near, but not in, the larynx.

6) Asthma/breathlessness. A feeling of chest tightness that limits the ability to take deep breaths or breath effectively is often called asthma. Some patients get asthma-like symptoms from reflux into their lungs, larynx or upper oesophagus. These type of symptoms often don’t respond to usual asthma treatments.

7) Belching/gas trapping. Belching, or discomfort relieved by belching is a common symptom with many oesophageal and gastric disorders. Sometimes patients bring up gas, or feel that gas is trapped either above (oesophageal) or below (gastric) the diaphragm. Sometimes patients with chest pain feel that they can relieve their discomfort by belching which can be an indicator of oesophageal spasm, but in other patients belching can be a sign of gas trapping in the stomach or a weakness in the valve at the bottom of the oesophagus.

8) Bitter taste. Some patients with reflux-like symptoms complain of a bitter taste in the back of their throat and in their mouth. This is almost never from reflux of stomach contents into the back of the mouth. While we sometimes fail to find the cause, there are many occasions when the bitter taste is caused by thick oesophageal mucus that the oesophagus produces when it feels it has become blocked off. A bitter taste in the morning, combined with coughing up thick sticky mucus is a classic symptom of oesophageal obstruction by a narrowing or spasm of the oesophagus.

The combination of cough, feeling short of breath, a bitter or burning taste in the mouth or throat, and a “funny feeling” in the throat is sometimes referred to as “**Silent Reflux**”, which is effectively reflux without feeling heartburn. While some people with these symptoms may have stomach acid/fluid in their throat or upper oesophagus, many other non-reflux diagnoses exist for these symptoms. There is a condition called Laryngo-phalangeal Reflux or **LPR**, where people predominantly have throat and

mouth symptoms. While these symptoms usually are not caused by reflux, they sometimes will be caused by reflux and will therefore respond to reflux treatments.

Difficulty Swallowing (Dysphagia).

This is a complex and often subtle symptom to describe. Any feeling of difficulty when swallowing that occurs on a regular basis is abnormal, but many patients will unconsciously change how they eat to avoid symptoms which may delay them seeking diagnosis and treatment. For example, if someone finds they can no longer comfortably eat chicken, meat or bread they will often just stop eating these things and carry on as though there is nothing wrong. Many people with swallowing difficulties will delay seeking medical help until they can no longer easily swallow liquids or until when vomiting/regurgitation disturbs their mealtimes. When asking about difficulty swallowing we wish to find out if they can tolerate solid food, soft food or liquids. Obviously those with intolerances to a wider range of foods have more significant underlying problems. Some find their intolerances occur all the time, whereas some patients have sporadic symptoms. Disorders that cause dysphagia can also be associated with chest pain, breathlessness, belching, regurgitation and a bitter taste in the mouth so misdiagnosis as “reflux” is extremely common.

Reflux. Causes, diagnosis and treatments.

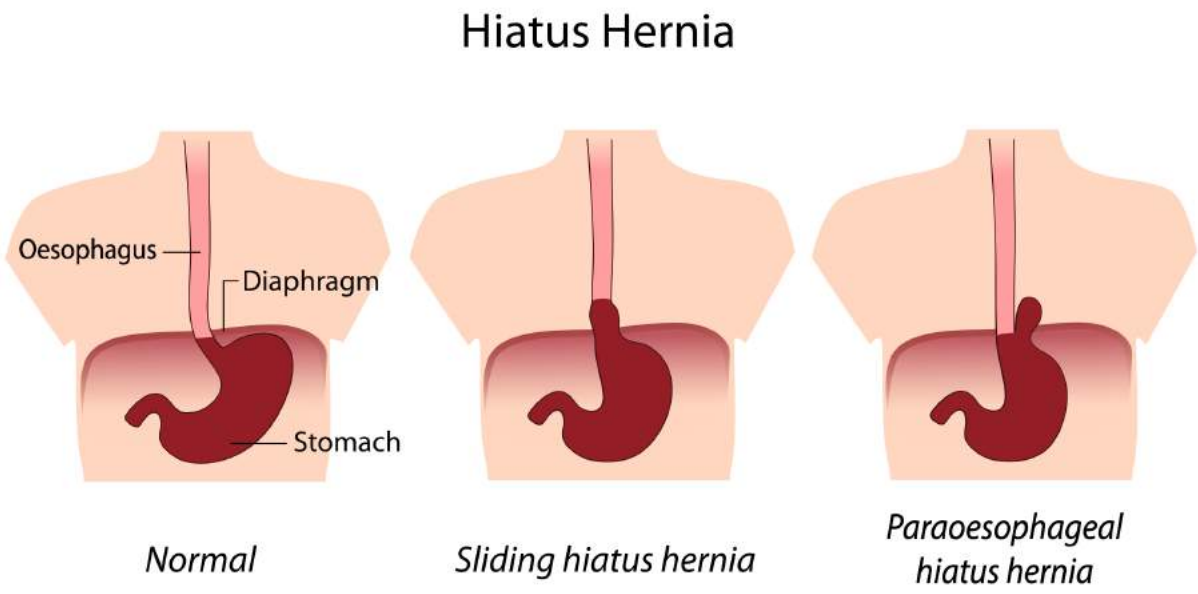
Reflux occurs when gastric content leaves the stomach and moves up to irritate the oesophagus, voice-box or lungs. This is not something that is supposed to happen frequently in healthy people, and it occurs only when the pressure inside the stomach becomes greater than the pressure keeping the lower oesophagus closed.

The five main cause/drivers s of reflux are:

1) Hiatus hernia
2) Weak lower oesophageal sphincter (valve)
3) Weak or abnormal oesophageal function (peristalsis)
4) Oesophageal Sensitivity
5) Obesity (increased bodyweight)
6) Gastroparesis (paralysed stomach)

Hiatus Hernia

The point where the oesophagus passes through the chest into the abdomen is called the hiatus. At the hiatus the oesophagus is wrapped by a clasp of muscle that keeps it closed so that stomach acid doesn’t squirt up out of the stomach whenever we cough or eat a big meal. When someone has a hiatus hernia the stomach gets pushed into the chest, so that when we eat a big meal, cough or lie down the acid in the stomach can easily flow up the oesophagus and cause reflux symptoms.



Weak Lower Oesophageal Sphincter

The lower oesophagus has a valve that is usually closed. It opens when we swallow otherwise food would get stuck in our chest when we eat. If this valve is weak, or if it opens at the wrong time, anything that increases pressure in the stomach will allow stomach content to move back into the oesophagus. 1/2 of the strength of the lower oesophageal valve strength comes from the Hiatus, but regulation of lower oesophageal valve closure is a bit complex. Coffee, chocolate, spicy foods and alcohol make the valve open it up, so does any meal, depending on its size. After we eat it's normal for the valve to open a little, in order to allow gas to that we have swallowed while eating to escape. In many people with reflux symptoms their lower oesophageal valve opens too frequently, and this leads to gastric content heading up the oesophagus. This is why most people with reflux learn to manage their symptoms by managing what they eat and drink.

Weak or abnormal oesophageal function (peristalsis).

The muscle of the oesophagus rhythmically contracts when we swallow to push food downwards towards the stomach. When reflux occurs, the oesophagus will react by contracting to push the acid/fluid back into the stomach before it does any harm. If the oesophagus doesn't contract, or contracts weakly, any refluxed acid won't be pushed out and will stay in the oesophagus. If the contractions are poorly co-ordinated, there are occasions also when they will push things back up the oesophagus, rather than down into the stomach.

Oesophageal Sensitivity

This is a complex topic, and more worthy of a conversation than an essay. There are hundreds of chemicals in the stomach. If you experience reflux of stomach content into the oesophagus its often your sensitivity to what's in your stomach that determines your symptoms rather than the volume. This is why so many people with bad reflux symptoms are told that "everything's ok" when they have an endoscopy. The fluid that they reflux irritates their oesophagus but causes no visible damage but does cause pain or discomfort. Oesophageal hypersensitivity symptoms can include heartburn, chest pain, cough, a bitter taste in the back of the throat or pain on swallowing.

Obesity

More than 60% of Australian adults are heavier than they should be. Increased weight leads to reflux by increasing intra-abdominal pressure, which "pushes" reflux out of the stomach up the oesophagus. Obesity also leads to a number of metabolic changes that predispose to reflux as well. Losing weight can be an effective treatment for reflux. Sometimes we undertake weight-loss surgery to help both reflux and weight problems.

Gastroparesis

If you stomach doesn't empty after you eat it remains full of fluid and food, like a high-pressure balloon. If the pressure in your stomach is vey high you may feel reflux/regurgitation, bloating and left sided pain and fullness after small meals.

Reflux Complications.

The large majority of patients with reflux experience symptoms but are lucky enough to avoid significant complications.

As reflux, unless treated surgically, is a permanent and usually progressive condition it is worthwhile to consider for each individual affected the potential long-term consequences of the condition.

Acid related complications. If oesophageal irritation turns into ulceration there is a risk of creating deep oesophageal ulcers (oesophagitis) which can bleed, causing anaemia. More importantly however, these deep ulcers create scarring which can lead to the oesophagus becoming rigid and shortened which then predisposes to further reflux because the persons subsequent hiatus hernia cannot be repaired.

Oesophagitis. Mild Oesophagitis (Grade A or Grade !) is common, fairly normal, and doesn't guarantee the person has reflux disease, because it usually disappears even if untreated. Moderate (Grade B or II) and above indicates a high likelihood of acid related injury, and higher grades of Oesophagitis indicate that

Medication related complications. The more powerful anti-acid medications, known as proton-pump inhibitors (PPI's) stop your stomach from producing acid and they have revolutionised treatment of reflux and stomach ulcers. While these medications are extremely safe, they can be associated with late side-effects and complications after years or decades of use. Over-prescription has been and is still a problem for many patients, either with prescription of an excessive dose or due to continued prescription after the medication is no longer needed. There are many patients with gut symptoms who do not have reflux or acid related disorders where prescription of PPI may be associated with increased risks of kidney disease, pneumonia, dementia, weak bones (osteoporosis) and a small increased risk of death after a decade or more of use. In general, patients should be on the lowest effective dose of these tablets, even half dose's or intermittent dose if it works, and should have the medication ceased once it is no longer needed. For patients with proven reflux however, the risks of PPI therapy are less than the risks of untreated reflux so continued treatment is justified.

Regurgitation related complications. If gastric content, which contains acids and activated enzymes makes it up to your upper oesophagus it can irritate the back of your throat and potentially your lungs as well. These type of reflux complications can include

1) Waking up with choking and shortness of breath.
2) Silent reflux with pneumonia from aspiration of gastric content into the lungs.
3) Asthma like symptoms that don't respond to asthma medications (adult onset asthma).
4) Chronic/persistent cough and/or voice changes.
5) Globus. This is a feeling that there is something "stuck" in the throat, sometimes this sensation is associated with people coughing up white mucus and/or complaining of a bitter taste in the back of their throat.

Barrett's Oesophagus. Barrett's is a potentially pre-cancerous change that occurs in the lower part of the oesophagus as a result of chronic reflux related injury to the oesophagus. When the lining of the oesophagus is injured by reflux the "skin" layer of the oesophagus gets stripped away, when this occurs over years this layer will repair itself, not with normal oesophageal lining but with an acid resistant lining which we call Barrett's (named after the person who first described it). The Barrett's tissue is abnormal and carries genetic mutations that allow it to survive in the hostile environment of the lower oesophagus. If these mutations progress parts of the lining can become pre-cancerous (we call this dysplastic) or cancerous. We manage Barrett's in a number of ways.

1) Diagnosis at endoscopy. Anyone who has had reflux for more than 5 years should have an endoscopy to determine the cause of their reflux and whether they have Barrett's or other complications. If Barrett's is discovered, then biopsies are taken to confirm this. Afterwards, repeat endoscopies should occur every 3-5 years in order to see if pre-cancerous changes occur.
2) Endoscopic treatment. The large majority of patients with pre-cancerous Barrett's and have this successfully eradicated with different endoscopic treatments with a high

likelihood (>98%) of protection from developing oesophageal cancer. There are a number of methods used.

a. Endoscopic resection (EMR or ESD are technical names for this). With this treatment a section of the oesophageal lining is removed using special endoscopic cutting devices. The area is then sent off to the lab for analysis. We use this method for any areas where we suspect there may be small cancers or more aggressive pre-cancerous growths. The treatment is very safe with risks of bleeding or oesophageal injury at about 1%. It is done usually on an outpatient basis.

b. HALO ablation. This treatment uses a special type of energy called "radiofrequency ablation" or RFA to destroy Barrett's tissue. When the oesophageal lining regenerates it comes back as normal oesophageal lining as the tissue containing the genetic mutations gets destroyed by the RFA energy. With this treatment we can treat far larger areas than can easily be done with the resection techniques above, and with a lower risk of complications. In the past, many patients who we now treat with RFA would otherwise have undergone major surgery to remove their oesophagus. The treatment is done on an outpatient basis but often needs to be repeated a couple of times to ensure adequate removal.

3) Anti-reflux surgery (ARS). As Barrett's is caused by reflux, and ARS resolves reflux in 95-98% of patients we will sometimes combine Barrett's treatments with laparoscopic ARS.

a. If someone has Barrett's combined with significant oesophageal ulceration it can be impossible to accurately assess it and treat it. We would then perform ARS to allow the inflammation to resolve before treating the Barrett's.

b. Because we know that Barrett's will recur after treatment, we may consider ARS to prevent recurrence in younger patients after the Barrett's has been treated.

c. Some patients will consider having ARS if they have Barrett's to reduce oesophageal acid exposure and hopefully reduce the risk of Barrett's progression.

Giant Hiatus Hernia.

Small or "sliding" hiatus hernias are quite common, and while many people with hiatus hernias don't have significant reflux, the large majority of people with significant reflux have a hiatus hernia that we repair at the time of Anti-reflux surgery (ARS).

There is another type of hernia called a "rolling" or para-oesophageal hiatus hernia. A hernia is a hole in a bit of muscle. The hiatus is part of the diaphragm, so a hiatus hernia is a hole in the diaphragm at the point where the oesophagus passes through it. Patients with large hiatus hernias have larger holes in their diaphragm, and in these circumstances a large amount of stomach is able to twist or rotate up into the chest causing a number of symptoms that will lead to a requirement for surgery.

1) Reflux. While some people with large hiatus hernias have terrible reflux and regurgitation, some do not. If someone has a hiatus hernia, but their reflux is well controlled by a PPI we will generally not operate on them unless their reflux gets worse or they get other problems from the hernia.

2) Bleeding. As the stomach constantly moves back and forth over the hiatus it can lead to a "chafing" effect with the development of small ulcers (called Cameron ulcers) on the inside of the stomach that can bleed. If someone bleeds enough to develop symptoms, then repair is recommended.

3) Chest pain, food getting stuck, pain after eating. These types of symptoms suggest a risk that the stomach is becoming twisted upon itself and is in danger of suddenly blocking off leading to strangulation of the stomach. If this happens the person affected becomes very unwell quite quickly and is at risk of the stomach losing its blood supply and dying which is clearly very dangerous event. The risk of dying may be as high as 1:10, so if patients with large hiatus hernia develop these types of symptoms we almost always recommend repair even in very old people. Hiatus hernia repair is frequently performed very safely in people in their mid-80s.

4) Shortness of Breath on exercise. This is the most common reason for us to fix giant hiatus hernias. Patients with large hernias, where the stomach ends up pressing on the heart find that they develop rapidly progressive inability to exercise or walk because the get very short of breath, especially after a meal. This occurs because the stomach compresses the Atria or inflow into the heart, and the coronary sinus's where the heart receives its own blood supply so it can't increase its function in response to stress or exercise. Patients with large hernias, with a normal cardiac stress test and lung function tests do very well with a repair, regardless of their age.

Diagnosis and treatment.

When people develop symptoms of reflux or difficulty swallowing (dysphagia) we want to offer them treatment to improve their symptoms but also do tests to determine what the cause of the problem is. If we treat the symptoms but take no action to treat the underlying condition we may miss the opportunity to treat it effectively. While its ok to offer young (under age 50) patients treatment for simple reflux symptoms without performing any tests, older patients and those with swallowing problems need tests to exclude more dangerous conditions. The majority of patients will have tried several treatments before being assessed for a diagnosis.

Diagnostic Tests.

The majority of people who experience "reflux" symptoms try antacids or acid suppression medication prior to having any tests done. If their symptoms don't improve quickly, if the person is over 50, has anaemia or symptoms of difficulty swallowing (dysphagia) are present then investigations to rule out serious conditions are worthwhile. No single test is able to diagnose every condition or its severity so patients with complex problems can sometimes need to undergo several tests before they get an accurate diagnosis or management plan. Prolonged treatment without an accurate diagnosis can be unhelpful to patients, but so can "over investigation". Tests often performed include;

1) Testing for H Pylori. Helicobacter Pylori is a bacteria that lives in the stomach of some people. It is the most common cause of gastric and duodenal ulcers and eradication of the bacteria will successfully fix ulcers in most patients and prevent their recurrence. H Pylori can also contribute to someone's risk of developing gastric (stomach) cancer. While the majority of gastric and duodenal ulcers are caused by H Pylori, only a minority of people with H Pylori will develop ulcers, so eradication of the bug if detected will often not make most people "feel better" unless they have an ulcer. H Pylori can be detected by a blood test, a breath test or by a biopsy taken at endoscopy.
2) Abdominal ultrasound and CT. Using radiology tests to look at internal organs is a useful way of picking up a number of conditions that are not related to reflux or ulcers but have similar symptoms. An ultrasound is a very safe and effective way of picking up gallstones especially. Abdominal CT (computerised tomography) is effective for a range of abdominal conditions, but it does involve a radiation dose so it is often not a "first line" test.
3) Endoscopy (gastroscopy). Under a light anaesthetic a flexible camera is passed through the mouth, behind the voice-box and down to the oesophagus, stomach and duodenum. A gastroscopy is used to diagnose reflux, ulcers or inflammation in the oesophagus, stomach and duodenum, as well as a hiatus hernia and cancerous or pre-cancerous changes in the upper gut. Patients with difficulty swallowing, with new symptoms in the upper gut area over the age of 50 and patients with persisting symptoms after simple treatments will usually be offered a gastroscopy to help diagnose their condition.
4) Barium swallow. This x-ray test is often used in patients with dysphagia, either before or after endoscopy. It is effective at helping diagnose hiatus hernia, oesophageal blockages and some abnormalities in oesophageal contraction.
5) Oesophageal function tests. These tests are very accurate, and are used to evaluate the severity of reflux when simple treatments are ineffective and to diagnose specific swallowing disorders such as Achalasia. Any patient having surgery for severe reflux, or treatment for swallowing disorders will need these tests performed.

Oesophageal Testing

Dysphagia/Swallowing Function tests.

Barium Swallow. This is an X-Ray test whereby someone swallows a thick fluid +/- bread or a marshmallow and the progress of what they have swallowed is followed on x-ray from the mouth and down into the stomach. This is a quick, painless and simple test that can be done at many X-ray labs. It is an easy test to organise when someone has unexplained swallowing problems or reflux, but it isn't as accurate as manometry (see below).

Manometry. This is the single most important test we can do on someone with a suspected oesophageal disorder. After some local anaesthetic is swallowed and sprayed into the back of the nose a fine catheter is passed via the nose into the oesophagus in order to measure the strength and co-ordination of oesophageal contraction and to measure the function of the muscular sphincters that are at the upper and lower end of the oesophagus. The catheter is passed relatively easily for the large majority of people and takes about 5 minutes during which time you are asked to swallow a couple of mouthfuls of water, and soft food and a large amount of information can be obtained from what is a relatively simple test.

Reflux tests. These are used when patients have persisting bothersome symptoms of reflux despite adequate treatment. The aim of these tests are to determine the severity of oesophageal acid exposure and the relationship between reflux and symptoms. We can measure acid at the lower and upper ends of the oesophagus over a 24 hour period and also measure non-acidic and weakly acidic reflux in patients where bile reflux or other problems are felt to be responsible for symptoms.

Testing methods.

Catheter Studies. The most common method of testing reflux is using fine catheters (approx. 3 mm wide) which are connected to an electronic device the size of a mobile phone. In order to introduce the catheter we spray the back of your nose and throat with local anaesthetic so passing the catheter down is straightforward and free of trauma. Only a small minority of patients fail to tolerate the catheter, and problems such as nose bleeds are rare. Once the catheter has been placed people head home with a plan to eat and drink normally and to press a symptom button every time they get symptoms. It is important that patients do the things that may bring symptoms on while they are having the test done and to record symptoms when the occur otherwise the test result may be negative. The following day the catheter is removed and the results analysed.

Catheter Free Studies. Another method of reflux testing which avoids catheters involves using endoscopy to place a single-use probe onto the oesophagus to perform measurements, the probe contains a battery and is connected wirelessly to an electronic device the patient carries in their pocket. The probe will measure reflux over a 96 hour period, after which time it detaches from the oesophagus and passes harmlessly into the toilet. This helps avoid the potential discomfort of having a catheter attached to your nose for 24 hours, but it requires an anaesthetic and endoscopy for placement and is more expensive for the person having the test performed.

Reflux Treatment.

Medications. Reduce acid but don't reduce reflux.

These medications reduce expose of acid to the oesophagus, but will not change non-acid or weak acid reflux events. They are usually safe however there are a lot of misunderstandings about how they work. These medications reduce the strength of acid that the stomach reduces so that reflux episodes can occur without causing discomfort.

Antacids. Rennies, Gaviscon, Mylanta etc. These agents neutralise acid to reduce symptoms.

Acid Suppression Tablets. (medical term = proton pump inhibitors, PPI's). Nexium, Somac, Pariet, Losec, Omeprazole, Zoton etc. These medications reduce the amount of acid the stomach produces but have no effect on the total volume of fluid that the stomach and duodenum produce. If someone takes a tablet for "reflux", the total number of reflux episodes they experience during the day are likely to be relatively unchanged, it's just that the medications weaken the acid to that the majority of reflux episodes occur without the person being aware that they are happening. There is now a realisation that in some people these medications have been over prescribed. Long term risks can include

osteoporosis (weak bones), pneumonia and perhaps an increased risk of dementia in a small number of people.

"Old fashioned" Acid Suppression tablets. Zantac, Tasac etc. while significantly less powerful than PPI therapy, they are stronger than antacids and can be used in patients who still have symptoms while on PPI therapy.

Gastric Motility agents. Motilium and Maxalon and others speed up gastric emptying and are referred to as "pro-kinetics". If someone has reflux that stays severe despite acid suppression and agent such as this can help reduce the amount of extra fluid in the stomach and therefore make reflux symptoms less likely.

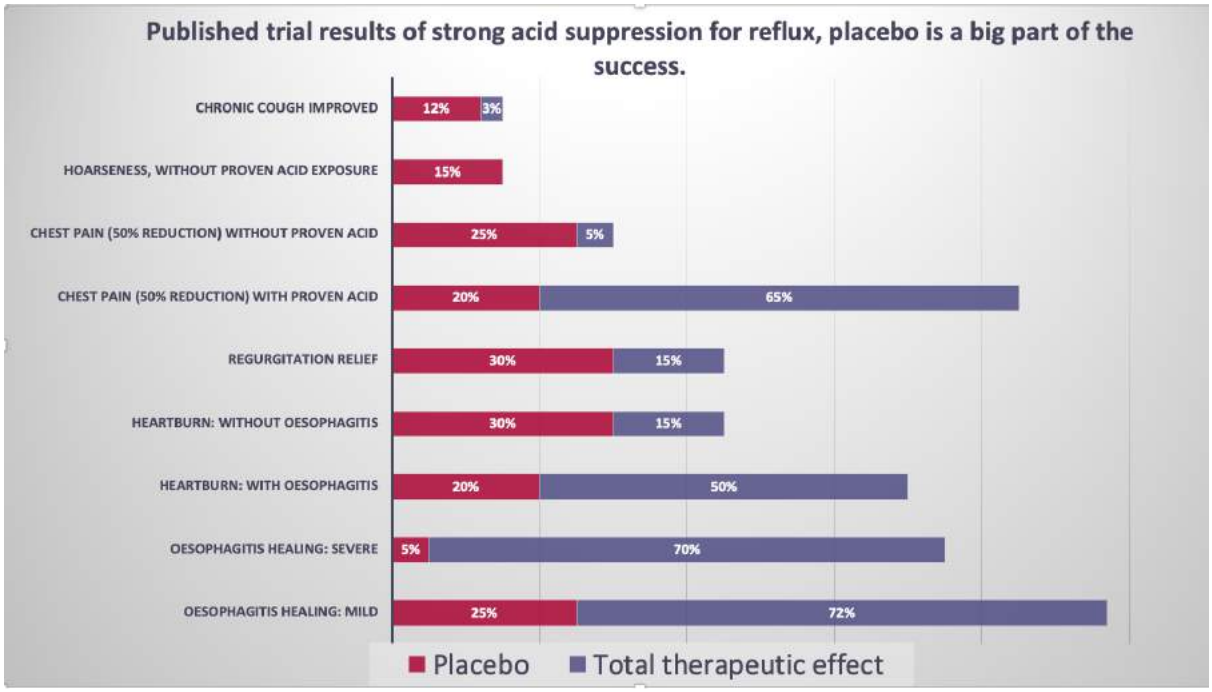
Medications that change oesophageal function. These medications aim to reduce reflux exposure by changing how the oesophagus works. They are medications that have been designed for other uses but have been found to be useful for some patients with reflux symptoms. Such medications include Bethanecol which increase the strength of the oesophagus, stomach and oesophageal valve, and Baclofen which can prevent the lower oesophageal valve from relaxing and allowing acid to escape the stomach.

Oesophageal Hypersensitivity agents. Some patients have significant reflux symptoms without having a large amount of fluid coming up into their oesophagus. While its often impossible to determine what they are sensitive too at least the tests we use can prove that nothing dangerous is going on. Medications that reduce sensitivity aim to reduce the frequency and severity of symptoms. Medications include Endep, Lyrica, Cymbalta, Mirtazepine and others.

Physiotherapy Exercises. Abdominal or diaphragmatic breathing exercises are easy to learn and are often very effective for reflux associated symptoms including belching and abdominal bloating. They usually need to be practiced a couple of times a day long term however in order to maintain their effectiveness.

How effective are medicines?

It all depends on the symptom we are trying to treat. Reflux tablets are excellent for treating acid related issues but are not great for other symptoms, as they don't "fix reflux", they just reduce acid.



Anti-reflux Procedures

These work by correcting/repairing the mechanical causes of reflux. The larger the procedure the more effective, but the larger the procedure the more important it is that accurate tests are done in order to avoid overtreatment and side effects.

Endoscopic surgical therapies.

These incisionless procedures require an anaesthetic and are performed from within the oesophagus and stomach.

Stretta procedure.

With this procedure Radiofrequency energy is introduced to the lower oesophagus to "tighten it". This is identical to the treatment that people have to reduce wrinkles on their faces by tightening their skin. Stretta has no direct effect on the lower oesophageal muscles, but it does reduce reflux symptoms in people who no longer wish to take antacid medications, or wish to reduce the amount of tablets they need to take.

RAP.

Endoscopic Resection And Plication.

With this procedure the junction of the oesophagus and stomach is tightened by bunching up some of the upper stomach with a suture device, to act as an extra cushion below the lower oesophageal valve. It may be ideal for people without significant hiatal hernia where the reflux is caused by a weak or inappropriately relaxing lower oesophageal valve. In people with larger hiatal hernias it isn't possible to do it safely or effectively.

TIF.

Trans-oral Incisionless Fundoplication

This is a true "surgical" procedure that creates a fundoplication similar to what we do in surgery, however it is performed endoscopically. It is not yet available in Australasia, and it isn't suitable for people with hiatus hernias.

Laparoscopic Surgical Procedures.

These all have a lot in common. General anaesthesia, 1-2 night hospital stay, mostly 5mm incisions and the ability to correct hiatal hernia which is the greatest driver of reflux in most people with oesophagitis (oesophageal ulcers) or Barrett's oesophagus.

Hiatus hernia repair and Hiatus Hernia repair with fundoplication.

The aim of this procedure is mostly to restore normal anatomy. Most people with reflux have symptoms that progress over years. This progression is mostly due to a gradually enlarging hiatus hernia with more and more stomach delivering more and more acid up into your chest. To repair a hiatus hernia, the stomach is first pulled back into the abdomen and then the hiatal muscles are tightened to snug around the oesophagus. In those who are identified to have very weak lower oesophageal valves the upper part of the stomach can be wrapped around the lower oesophagus, a "fundoplication". Wrapping the stomach around the oesophagus creates an additional clasp around it which helps prevent reflux from occurring.

How does a Hiatus Hernia cause reflux?

Physics is the short answer. The abdomen, where the stomach resides is a place of +ve pressure (your abdomen always bugles out), the chest cavity where the oesophagus resides is a -ve pressure environment (every time you take a breath in you create a vacuum in the chest). People without a hiatus hernia have a valve in the lower oesophagus that is comprised of muscle inside the oesophagus but also of a thick clasp of muscle arising from the diaphragm, called the hiatus. This muscle circles the oesophagus and whenever the diaphragm contracts (when you breath) it gently squeezes the oesophagus to keep it closed. This helps to prevent fluid in the +ve pressure stomach from being sucked up into the -ve pressure oesophagus (like fluid being sucked up a straw).

Patients with hiatus hernias lose this defence against reflux, which means that acid in their stomachs can wash up their oesophagus. Restoring normal anatomy by fixing a hiatus hernia will allow most patients to get off their anti-reflux tablets.

What else does fixing a hiatus hernia do?

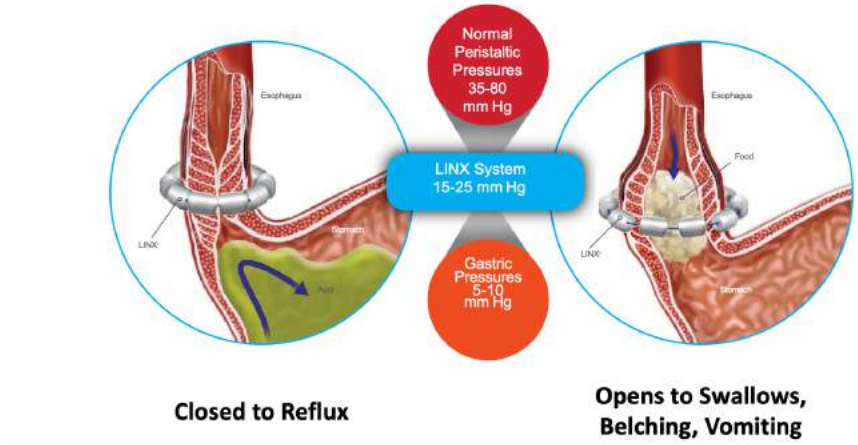
People with very large hernias, who have 50% or more of their stomach in the chest will often complain of a number of other symptoms.

Pain after meals

Shortness of breath when the try to do any exercise.

These people have compression and obstruction symptoms. The heart is compressed by the stomach so it can't beat more effectively when they want to exercise, and the stomach may become obstructed because it's twisted around itself. Fixing the hernia moves the stomach out of the chest and straightens it out which corrects these issues.

Hiatus hernia repair and Linx™ procedure.



One problem with fundoplication is that some people after this type of surgery can end up experiencing bloating and the inability to belch as well as problems swallowing if the fundoplication is too tight. This is because fundoplication's are designed to increase lower oesophageal pressure, but they can't vary the pressure they apply accurately. They can be just right (minimal reflux, minimal bloating), too tight (no reflux but some difficulty swallowing, no belching or ability to vomit, risk of bloating after meals) or too loose (reflux persists; however, some fundoplication side effects may also exist). The Linx™ device is a device that keeps the oesophagus closed when you are not eating but it completely opens when you eat or try to belch. In this way it provides potentially better reflux control than a fundoplication but with less side effects.

Bariatric or Weight Loss Surgery (WLS). As weight problems are strongly associated with both hiatus hernia and reflux, we will sometimes combine hiatus hernia repair with weight loss surgery.

Lap Gastric Bypass. Bypass procedures create for people a new small stomach, about ½ the size of a computer "mouse". Because the stomach is small and acid is directed away from it, there isn't any acid that can "reflux" back up the oesophagus. The gastric bypass is usually our procedure of choice for very heavy people with very bad reflux, however we will sometimes offer it to patients who have had failed hiatus hernia repairs a couple of times. In studies it seems to be the "gold standard" anti-reflux operation, but we don't do it routinely as the new stomach anatomy requires people to take multivitamins lifelong, and not everyone wants or needs to lose that much weight. Most patients after a bypass will lose around 40% of their starting weight, however lighter people will usually lose less.

Lap Sleeve Gastrectomy. The "sleeve" is our most frequently performed weight loss operation. It can on occasions make reflux worse, so if people have major reflux problem combined with a weight problem, the bypass is usually the procedure of choice. People with more moderate reflux symptoms will often be Ok with a sleeve, however, they may have to take a PPI tablet lifelong to help control reflux symptoms. On average, patients having a sleeve will lose about 30% of their starting weight.

LapBand. The lapband can be an ideal procedure for people who need anti-reflux surgery but who also want to lose a bit of weight as well. Patients tend to lose about 15% of their starting weight or 8-10 BMI points. Its not that suitable for larger patients who want to lose more weight, as tightening the band too much to achieve this much weight loss will often cause reflux by making things get stuck in the oesophagus which then stretches up over time.

Dysphagia Predominant Syndromes.

Motility disturbances.

Dysphagia (I can't swallow properly) is quite common in association with oesophageal disorders like reflux, hiatus hernia or when someone has an oesophageal blockage from an ulcer or tumour but sometimes it can occur without an obvious physical blockage. If someone experiences pain, blockages or regurgitation after they swallow but there "isn't anything to see" on endoscopy then that person has a problem with the way their oesophagus works. This is similar to a car engine or TV that looks normal; however, it doesn't work correctly because the electrical components are broken.

Oesophageal motility symptoms are often mistaken for reflux. This is because either the person regurgitates food or saliva in their oesophagus, because the oesophagus can produce bitter tasting fluid that people mistake for stomach acid, or because oesophageal spasm can cause pain similar to heartburn pain. If someone feels they have "reflux", but they get no benefit from anti-reflux medications they probably have a motility disorder.

Diagnosis of motility disorders.

Every person who has difficulty swallowing must have an endoscopy. An endoscopy will not diagnose most oesophageal disorders, but it does exclude the ones which are potentially life threatening. Once an endoscopy has been performed the next test depends on the severity of symptoms. If someone has a normal endoscopy and wants to pursue further options to help their symptoms, then tests designed to diagnose oesophageal disorders are required.

Manometry. This is the only test able to reliably provide diagnosis of an oesophageal disorder. Other tests can suggest a diagnosis but can rarely make one. Manometry measures oesophageal valve function, oesophageal co-ordination and power, but also how the oesophagus can process liquid and solid swallows.

Barium Swallow. Because this test examines the oesophagus while someone swallows it is effective at showing major blockages but cannot measure oesophageal co-ordination, power or valve function. If someone has significant symptoms and a normal barium swallow, further investigations will be needed.

Achalasia.

Is an uncommon disorder, occurring in about 250 people per year in Australia. People with achalasia complain of dysphagia (food getting stuck), regurgitation/reflux, weight loss and chest pain. Most will have 2 or more of these symptoms, but some will only have 1. Achalasia creates symptoms that come on reasonably quickly however most patients will spend many weeks, months or years putting up with incorrect diagnoses and treatment because their oesophagus often looks normal when they have an endoscopy done. Achalasia has 3 versions; Type I, the oesophagus is weak and stretched, Type II, the oesophagus is "high pressure" and chest pain is common and Type III where the whole oesophagus spasms and is abnormal.

Achalasia is a disorder with 2 main components

1) Absent or abnormal peristalsis (contractions) so that food isn't pushed down the oesophagus when they swallow.
2) Non-relaxing lower oesophagus. If the lower oesophageal valve (sphincter) doesn't open when someone swallows then food gets stuck in the lower oesophagus and causes pain, regurgitation and chest pain.

The treatments we have are directed towards the lower oesophageal sphincter. If someone is diagnosed and treated early enough then some of the other function of the oesophagus can recover, but in most cases peristalsis of the oesophagus remains abnormal.

Diagnosis.

As anyone who has difficulty swallowing needs an endoscopy, this is usually the first test performed. Some may also end up having barium swallow x-rays, but the only diagnostic test is Manometry.

Treatment.

Mostly treatments are directed towards loosening the lower oesophagus. Sometimes medications like blood pressure tablets or heart tablets can be tried to reduced pain, however these medications usually have fairly minimal effect, and are best reserved only for people with mild symptoms or advanced old age.

Therapy which are known to be effective are:

1) **Botox injection.** This is a simple and safe procedure whereby Botox™ is injected into the lower oesophageal valve to loosen it. This will improve symptoms in 2/3 patients however it wears out over 6+ months so isn't suitable for long term treatment. Each time the Botox™ injection is repeated it is less likely to be effective, and it also eventually leads to scarring which makes other treatments riskier.
2) **Endoscopic Pneumatic Dilation.** During an endoscopy a balloon of 30 mm or more size is dilated in the lower oesophagus to stretch and rupture oesophageal muscle fibres. The treatment usually needs to be performed 4 times over a couple of years to get an 80% success rate. Each tome the procedure is performed there is a 1% chance of a serious oesophageal injury, so this often means that many patients end up accepting a "good enough" swallowing outcome rather than an excellent outcome because they are worried about the risks every time it's done.
3) **Endoscopic Myotomy** (Per oral endoscopic myotomy or **POEM**). With this procedure an endoscope is used to cut the muscle of the lower oesophagus and fix the blockage. The procedure takes a bit over an hour to perform in most people and it requires a full anaesthetic and a 1-2-day hospital stay. One treatment will lead to >85% relief from swallowing problems and recovery is reasonably quick. There is about a 1% chance of oesophageal injury or other complications with this treatment. POEM has become the preferred method of achalasia treatment for most clinicians and patients.
4) **Laparoscopic** (surgical) **Myotomy**. **Heller myotomy**. This is a keyhole operation using mostly 5mm incisions where the lower oesophageal sphincter is cut, and a piece of stomach sutured to the lower oesophagus as an anti-reflux valve. The risks and hospital stay are similar to POEM but recovery is usually a little slower. The Heller myotomy has the best-known long-term results but is now becoming less common because of POEM.

Other Motility Disorders.

Since our testing has become more sensitive, we have now discovered a whole host of conditions that cause chest pain, reflux-like symptoms and swallowing difficulties. These conditions include Jackhammer oesophagus, Oesophago-gastric Junction outflow obstruction and a whole host of "small print" conditions. Many of these conditions have treatments that help; however, the options are not usually as straightforward as for the diseases discussed elsewhere in this booklet. For these conditions, if people need treatment, we will often start with medical treatments such as "calcium channel blockers" (Nifedipine, Diltiazem or others), which are antihypertension medications, GTN (glycerine tri-nitrate) patches or tablets which are usually used for angina and Phosphodiesterase inhibitors (Sildenafil, Tadalafil or others) which, beyond their usual use, are also effective for several cardiac conditions. If these fail endoscopic treatments such as Botox therapy, dilation of oesophageal muscle or myotomy can be considered.

Summary.

People with reflux and oesophageal symptoms are able, thanks to improved diagnostic testing, to get diagnosis and treatment for unpleasant symptoms, even if they have been present for years and endoscopies are "normal". Endoscopic and surgical therapies for these conditions are safe and effective, as long as appropriate steps have been taken to confirm the diagnosis beforehand.

https://www.mja.com.au/journal/2018/209/10/deprescribing-proton-pump-inhibitors-why-when-and-how