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REPAIR OF THE BILE DUCT AFTER INJURY DURING LAPAROSCOPIC OR KEYHOLE REMOVAL OF THE GALLBLADDER

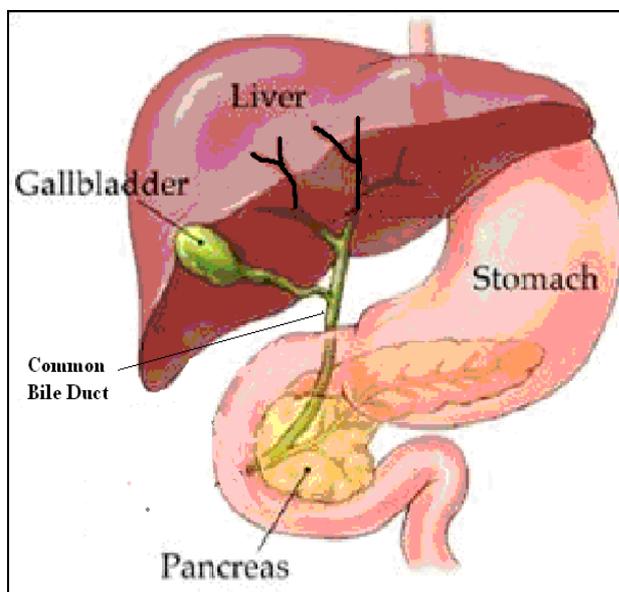
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BILE DUCT INJURY DURING REMOVAL OF THE GALLBLADDER

Keyhole or laparoscopic removal of the gallbladder is one of the most commonly performed surgical operations. There are literally thousands done in Australia every year. Damage or injury to the common bile duct is one of the most serious complications of removal of the gallbladder. Fortunately it is very uncommon (1/1500 cases). When it happens however, it can be a difficult problem to address. Most patients who have their gallbladder surgery complicated by a bile duct injury will be transferred to a large hospital like the Princess Alexandra or Greenslopes Private Hospital and be managed by a unit like ours, that specializes in the repair of this sort of problem. This booklet is to inform you about your condition and the care you might receive.

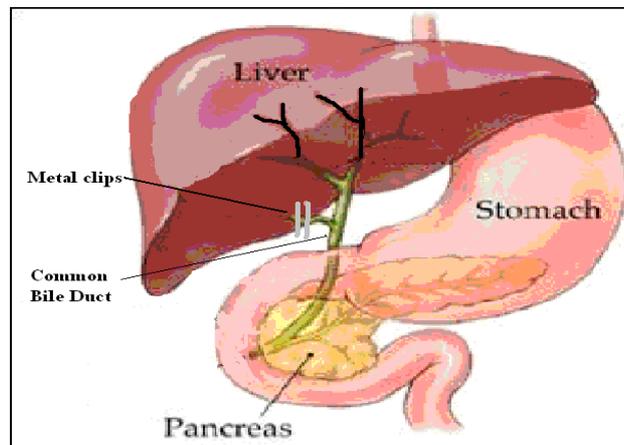
WHAT IS MY BILE DUCT AND WHY IS IT SO IMPORTANT?



The normal appearance of the bile duct and gallbladder

The bile duct is the pipe about 5-10mm in diameter that carries bile from the liver into the bowel. Bile is made 24 hours a day in the liver and its job is to break up the fat in the food we eat. The gallbladder is a storage tank for bile and puts extra bile into the system when a fatty meal comes along.

After the gallbladder is removed, the bile duct carries on transporting bile into the bowel. Drainage of bile from the liver is essential for your liver to function properly.



The appearance of the bile ducts after removal of the gallbladder. There will be three or four metal clips present. The bile duct remains intact.

WHY HAS THIS HAPPENED TO ME?

Gallbladder disease and gallstones remain a challenging surgical problem. Despite modern medicine and technology progressing rapidly, gallbladder problems can present themselves when they are very advanced. There can be severe inflammation and swelling. Gallstones can be present for years and can erode into all sorts of places, including the bowel, liver and bile duct.

The principle of gallbladder surgery is to remove the gallbladder and stones. Metal clips are placed across the outflow of the gallbladder. The common bile duct is always left intact. Surgeons take many steps during the operation to ensure that only the gallbladder is removed and that the bile duct is not damaged. Sometimes, the inflammation is so severe that it can be very easy to mistake the common bile duct for the gallbladder. The gallbladder can be fused to the bile duct. This is when an injury to the bile duct is most likely to occur. The bile duct injury may not be apparent during the gallbladder operation and it might only be discovered afterwards.

The other reason for a bile duct injury is an unusual configuration of the bile ducts. Everyone has a unique layout of these ducts and occasionally it may be quite easy to damage one because of unexpected anatomy.

If the bile duct is injured, it is also quite common for one of the arteries to the liver to be injured at the same time.

It is fair to say that even a surgeon who removes hundreds of gallbladder operations every year will eventually damage a bile duct. It is a known and accepted complication of this operation.

HOW WILL MY SURGEON KNOW IF I HAVE HAD AN INJURY TO MY BILE DUCT?

There are several ways that it might be discovered:

During the operation:

It can be immediately obvious that there has been a bile duct injury. There are several options for the surgeon in this situation.

- If the surgeon has expertise in complex liver surgery, they will make a bigger cut on your tummy and repair the problem immediately.
- If the surgeon does not feel comfortable operating on the bile duct (this is most common) there are a few options.
 - If you are having your gallbladder removed in Brisbane, your surgeon may call a colleague who is experienced with this problem and the bile duct will be repaired during the same operation via open surgery.
 - If you are in a hospital outside the metropolitan area, then it is likely that you will have a drain tube placed in your tummy to control any leak of bile and you will be transported by air or road to Greenslopes Hospital or Princess Alexandra Hospital for further surgery.

Discovered after the gallbladder surgery:

Bile duct injuries may not be apparent until a day or two after surgery or less commonly many weeks after the operation. You may experience:

- Loss of bile in a surgical drain
- Pain that is greater than expected after routine gallbladder surgery
- High fever and chills
- Jaundice

WHAT TESTS WILL I HAVE DONE IF A BILE DUCT INJURY IS SUSPECTED?

If the bile duct injury is obvious during the surgery, no tests will be needed and immediate repair will be performed if suitable expertise is available.

If the bile duct injury presents after the operation, there are several tests we can do to confirm it. Again, sometimes no tests are needed and sometimes many are needed.

1. Blood Tests

Liver function tests may show jaundice and the whites of your eyes might be yellow.

2. CT scan of the abdomen

This may confirm that there is a large amount of fluid present in the abdomen. This is not normal after removal of the gallbladder. This fluid can be bile.

3. ERCP – Endoscopic Retrograde Cholangiopancreatography

ERCP gives an X-ray picture of the bile duct. If the bile duct is injured, it is usually very obvious on an ERCP. This test may also be used to treat minor bile duct problems after gallbladder surgery. A plastic tube called a stent can be placed to stop bile leaking out of a side hole in the bile duct. This can completely fix the problem. The stent tube is temporary and will be removed several weeks later. ERCP is done under a light anaesthetic by a skilled gastroenterologist. A flexible telescope is inserted via the mouth into the stomach. It is not performed in every patient and has some serious risks including pancreatitis, perforation of the bowel and bleeding.

4. MRI

MRI is a type of X-ray that is very useful and will give the same information as an ERCP without the risks.

5. Key hole surgery or laparoscopy

Repeating the laparoscopy is sometimes done to work out what the problem is. For minor injuries or a leaking stump of the gallbladder, the problem may be fixed with keyhole surgery alone. If the problem is significant, you will proceed to open surgery under the same anaesthetic.

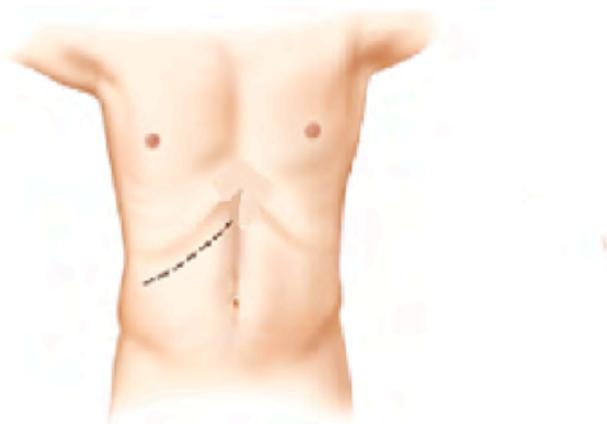
HOW WILL I FEEL IF I HAVE HAD A BILE DUCT INJURY?

Patients with a bile duct injury might experience many things.

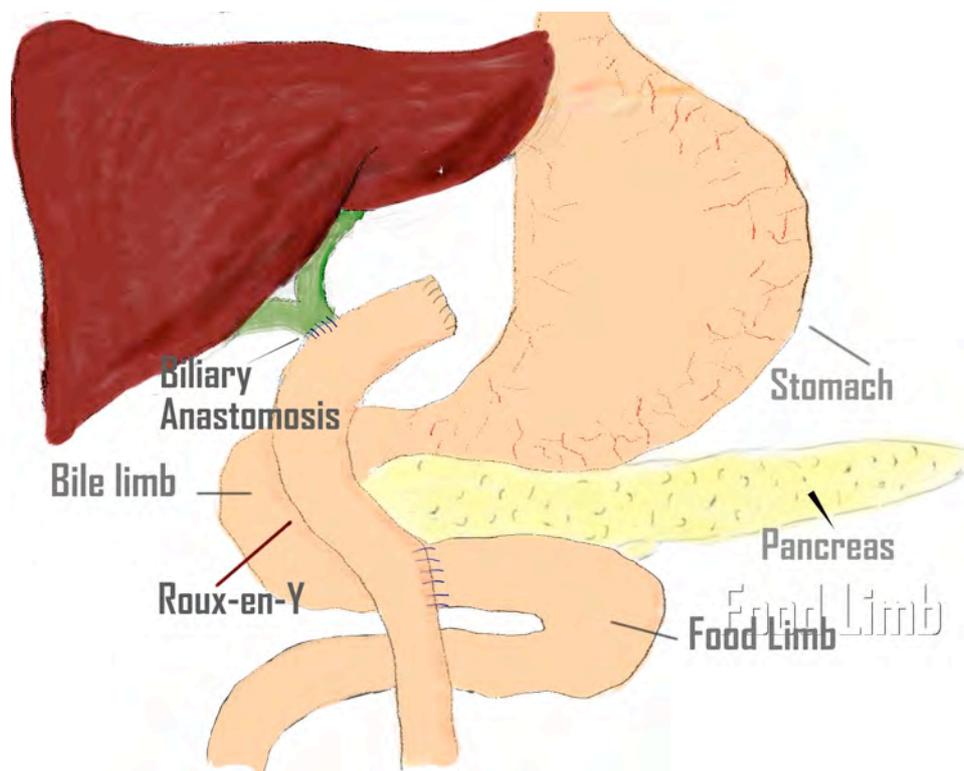
- Pain: sometimes bile in the tummy is painful. You will be given pain relief but the pain will not be better until the problem is fixed.
- Itchy: patients who are jaundiced may be terribly itchy.
- Fear and confusion: like any unexpected complication it is common to feel afraid. This is especially so if you have been transferred to our hospital from outside Brisbane. It can be very intimidating. Please ask questions if you don't understand what is happening.

HOW IS A BILE DUCT INJURY FIXED?

For a major bile duct injury you will have open surgery. The incision will be in the upper part of your abdomen, on the right hand side just beneath the ribs.



Frequently, the entire bile duct will have been inadvertently removed or clips may have been placed across the duct, causing damage that cannot be repaired. If this is the case, it is not possible to stitch it back together. An ingenious procedure call Roux-en-Y (roo-en-Y) is performed, where a piece of bowel is brought up and stitched onto the cut end of the bile duct. Depending on the type of injury, there may be multiple bile ducts to sew onto the bowel. (See picture)



This is how your bile duct will drain after a reconstruction for bile duct injury. A piece of bowel is sewn onto the bile duct.

WHAT TO EXPECT IMMEDIATELY AFTER SURGERY

Pain Relief

On the first day after surgery, there may be a moderate amount of discomfort at the site of the operation.

You will be provided with suitable pain relief. This is likely to be:

- Patient Controlled Analgesia (PCA) and a “Pain buster” - a button you will press that results in strong pain killers (like morphine) running straight into your IV line. This is combined with a tiny catheter placed in the wound that delivers local anaesthetic. These devices are very safe and have locking mechanisms to prevent overdose.

IT IS VERY IMPORTANT THAT YOUR RELATIVES DO NOT PUSH THE PAIN BUTTON FOR YOU AS THIS WILL RESULT IN AN OVERDOSE OF MEDICATION THAT MAY STOP YOU BREATHING.

Every effort will be made to minimize the discomfort and make it bearable. Your nurses will be monitoring your level of pain frequently.

When you start eating, you will be converted to oral pain relief.

Drain tubes

You will have a number of plastic tubes coming out of your body following surgery. They will vary a little depending on your particular medical need. They will be removed at variable times following your surgery under our direct supervision.

1. **IV line:** In your arm and in your neck (placed under anaesthesia) to give you fluids and pain relief.
2. **Urinary catheter:** tube placed in your bladder so you don't have to get up to pass urine.
3. **Abdominal drain tubes:** one or two soft plastic drains coming out of your abdomen that are placed along the cut surface of your liver to drain blood or bile so it does not collect in your abdomen.
4. **Stomach tube:** you may wake up with a tube in your nose that goes into your stomach to stop vomiting. This will usually be removed a day or two after surgery.
5. **Arterial line:** a fine catheter will be inserted into an artery in the wrist to monitor your blood pressure.

Eating

You will not have anything to eat or drink for the 1 – 2 days after surgery. An intravenous infusion will provide you with the necessary fluids.

We will let you know when you will be able to eat.

It is very common that you will lose your ability to taste food. This will return in the first month after surgery.

It is normal to have a sore throat for a few days after the surgery.

People who drink more than two cups of coffee a day may notice a caffeine withdrawal headache and irritability a few days after surgery.

Urinating/Bowel Movements

For the first few days, there will be a catheter in your bladder so you will not have to get up and pass urine. You will probably not have a bowel movement for several days after the surgery. Your bowels will eventually work, even though you haven't eaten much.

Intensive Care

After the operation is finished, depending on your condition you may be transferred to intensive care. You may be kept asleep (artificial coma) for a short time after the operation. Alternately, you may be woken up straight away. There are many factors that go into making this decision and your family will be told whether you will be awake or left asleep.

Activity

You can expect your nurse and physiotherapist to help you to get out of your bed on the first day after surgery. You will be able to walk short distances even with all of the tubes and intravenous lines.

As each day passes your tolerance for walking and sitting in a chair out of bed will increase. This is extremely important to prevent pneumonia, clots in the legs and loss of general condition.

Your Incision

You can expect to have a waterproof dressing over your incision for the first 5 days. We will remove the dressing at the appropriate time. You will be able to shower with the waterproof dressing on. It is quite common to have a small amount of leakage from the wound. Usually there will be no stitches to remove. They will dissolve.

Other Medications and Preventative Measures

You will be given a blood thinner once or twice a day as a small injection under the skin. This helps to prevent clots in the legs or deep venous thrombosis (DVT) that may travel to the lungs and be life-threatening. If you are in a high risk group for DVT, you may be sent home with this injection for several weeks after surgery. You or a family member will be taught how to give the injections.

You will be asked to wear TED stockings throughout your hospital stay. These help prevent clots in the legs. You may discontinue these when you are able to get up and walk easily by yourself.

In many instances you will be given a medication to decrease the acid secretions in the stomach. This prevents stomach ulcers that may occur after major surgery.

A physiotherapist will see you daily whilst in the hospital. You will be shown breathing exercises and be given a breathing device (Triflow) to help to expand your lungs and prevent pneumonia.

You must not smoke at all.

After surgery, alcohol should be avoided for at least one month to give your liver the best possible chance to be healthy.

Other Important Information

You can expect to see your primary surgeon every week day. On weekends or at times when your surgeon is operating elsewhere, you will see one of the practice partners. All are very experienced in this type of surgery and commonly assist each other in the operating theatre.

We will make every effort to keep you informed of your progress. We will always be honest and open with you and your family. Feel free to ask questions.

Length of Stay in Hospital

On average most patients will expect a 1 – 2 week hospital stay after the repair of a bile duct injury. This time can differ greatly for individual patients and individual operations. Some people go home faster than other and others stay much, much longer. You will not be discharged before you can walk unaided and care for yourself.

WHAT ARE THE COMPLICATIONS THAT MAY HAPPEN IMMEDIATELY AFTER REPAIR OF A BILE DUCT INJURY?

Bile duct injury can be a challenging problem to fix. Usually only one operation is required but occasionally it may take several operations to mend the bile duct. This list of complications is not meant to frighten you, even though it seems scary.

The most serious and specific complications that may be seen after a bile duct and the operation to repair it include:

Bile leak

This is usually obvious in the soft drain that is left in your abdomen after the repair operation. Because we are placing dozens of fine stitches in tiny bile ducts, bile can leak around the stitch holes. This usually heals itself. If the bile leak is large in volume or becomes infected, you may require further surgery or drainage in the x-ray department.

Bleeding

This usually occurs during the course of your initial gallbladder surgery. If there is an injury to the liver artery, the bleeding can be significant and you may require a blood transfusion. It is uncommon to have to return to theatre post repair for bleeding but this certainly may occur. The chances of acquiring a viral disease such as Hepatitis B, C or HIV via blood transfusion are exceptionally low.

There is a terrible bleeding problem that may occur after bile duct surgery called 'haemobilia'. This is where inflammation causes an artery to attach itself to the bile duct, resulting in bleeding into the bile duct. This problem can most often be fixed with special x-ray techniques.

Infection

Bile duct injury may result in infected bile collecting around the liver, liver abscess and wound infections.

Liver resection

Occasionally the bile duct and artery to one side of the liver may be so badly damaged that they are not repairable. The decision may be made to remove a section of the liver to fix this problem.

Other immediate complications of bile duct surgery

Like all major surgery there are a number of serious complications that may occur. These must be dealt with on a case-by-case basis. Some of these complications are:

- Death: this is rare but does occur after bile duct injury.
- Infections: wound, pneumonia, urine, intra-abdominal, IV line related.
- Punctured lung secondary to the IV line in your neck.
- Damage to the hand from the arterial line in the wrist.
- Clots in the legs that may travel to the lungs – deep venous thrombosis and pulmonary embolus. This may be fatal.
- Stomach ulcer that may bleed: this may present as a vomit of blood or black bowel motions.
- Urinary catheter complications: unable to pass urine after the catheter is removed especially in men.
- Permanent or temporary damage to nerves in the arms, legs and neck due to prolonged immobilization of the operating table. This may result in loss of feeling or movement.
- Wound pain and prolonged numbness under the wound.
- Hernia of the wound.
- Bowel obstruction due to hernia or adhesions and this risk is life long.

WHAT ARE THE LONG-TERM COMPLICATIONS AFTER BILE DUCT INJURY?

Once the recovery process is complete, there are very few long-term complications. Most complaints relate to some pain around the wound, numbness and occasionally hernias.

Narrowing of the bile duct

Patient's having a biliary reconstruction may develop a narrowing of the new join up between the bile duct and bowel. This occurs in 20-30% of patients who have had a bile duct injury. This is because the blood supply of the bile ducts at the time of injury can be poor and this causes severe scarring. The cut bile duct can also be very small resulting in a very difficult join up. Narrowing of the duct will usually occur in the first year and may present as altered blood tests, jaundice or fever. The solution to this problem is to put drain tubes through the skin into the blocked bile duct. You will then require further surgery to correct the problem.

Loss of weight

It is common for patients to lose up to 5 to 10% of their body weight after this type of surgery. The weight will be gained back within 6 months.

Liver Transplant

Rarely, the bile duct is so badly damaged and over the long term is not able to be repaired. In these cases a liver transplant may be the only option. This is very uncommon.

AFTER DISCHARGE

Going home

You will not be sent home until you are walking unaided and able to care for yourself. You may need to have help at home preparing meals and cleaning because you will be tired for a few weeks. This is a time to rely heavily on family and friends and it is a good idea to have someone at home with you for the first week or two.

Your medications

We will tell you which medications you should take at home. If needed, you will go home with a prescription for pain medicine to take by mouth. It is also common to leave with a medication to prevent stomach ulcers.

Your incision

Your dressing will be removed before you leave the hospital and if it is not leaking it will be left open to the air. You may wear loose clothing over the top of it.

Your incision may be slightly red along the cut. This is normal. If there is spreading redness or a new painful or uneven bulge appears, this is not normal and you should contact the rooms as soon as possible.

You may see a small amount of clear or light red fluid staining your dressing or clothes. If it is minor cover that part of the incision with a pad. If leaking is severe, or if it is pus, you should contact the rooms.

You may gently wash dried material off from around your incision. Pat your wound dry with a towel. Do not rub soap, talc or moisturizer into your incision until at least 4 weeks or until it is fully healed.

You may rub vitamin E cream onto the incision after it is fully healed.

It is normal to feel a ridge along the incision. This will go away.

It is normal to have a patch of numbness under the wound. This will not go away, but you will stop noticing it.

Over the next few months your incision will fade and become less prominent.

Your deep muscle layers are sewn together with nylon stitches that do not dissolve. If you are thin, you may feel the knotted end of one of these stitches under your wound. This is harmless. If it annoys you, it can be easily removed at some time after your surgery. Occasionally a stitch may poke out of your wound. This is quite safe. If it bothers you, you may snip it off with a pair of scissors. Otherwise it will disappear about 8 weeks after the surgery.

Passing drain tubes in a bowel motion

During surgery, we may place several soft pieces of plastic tubing to hold open your bile duct. These may pass with your bowel motion at any time after your surgery. It is usual not to notice them. If you do see them in the toilet, it is completely normal. DO NOT retrieve them from the toilet bowl and you DO NOT have to call and let us know they have passed. When these tubes are still inside you they will be seen on an X-ray. It is possible that some tubes remain in the bile duct forever. Only rarely do they need removal.

How you may feel

You may feel weak or "washed out" when you go home. You might want to nap often. Even simple tasks may exhaust you.

You might have trouble concentrating or difficulty sleeping. You might feel depressed.

These feelings are usually transient and can be expected to resolve in about 6 – 8 weeks.

Some people have difficulty coming to terms with this very unexpected outcome. It can result in a loss of confidence and a feeling of loss of control. Please talk to us if you feel like this.

Activity

Do not drive until you have stopped taking strong pain medication and feel you could respond in an emergency.

It is normal to not be able to lie on your right side for several weeks after the operation.

You may climb stairs and raise your arms above your head.

You may go outside, but avoid traveling long distances until you ask us about it at your next visit.

Do not lift more than 10 kg for 6 weeks. (This is about the weight of a briefcase or a bag of groceries). This applies to lifting children, but they may sit on your lap.

You may start some light exercise when you feel comfortable.

You may swim after 4 weeks.

Heavy exercise may be started after 6 weeks - but use common sense and go slowly at first.

You may resume sexual activity when you feel ready unless we have told you otherwise.

WILL THE SURGEON WHO REMOVED MY GALLBLADDER BE TOLD WHAT HAS HAPPENED TO ME?

Yes, we will let them know how you are going. All surgeons have complications and many patients experience complications. You can be sure that your original surgeon always has your best interests at heart and will be very concerned about your welfare. Bile duct injury can happen even in the best of hands and to surgeons who have done thousands of gallbladder operations.

SHOULD I GO AND SEE THE SURGEON WHO TOOK OUT MY GALLBLADDER?

Yes, most definitely. Your original surgeon will want to see you for follow-up and you should make an appointment to see them after you go home. We will also be following you up and checking your liver function tests for the first year or two.

WHAT CAN MY FAMILY DO TO MAKE THIS UNEXPECTED COMPLICATION EASIER FOR ME?

Income Protection Insurance and Centre link

If you have income protection insurance, start doing the paperwork required to claim as early as possible. Centre link claims take many weeks to process. It is difficult to recover well when you are worried about finances.

Family

This is the time to rely on family and friends for support. If you receive offers of home cooked meals and household help, accept them happily. That way you can concentrate on getting better.

WHAT IF I AM COMING IF FOR AN ARRANGED OPERATION A LONG TIME AFTER BILE DUCT INJURY?

Fasting

You must have nothing to eat or drink for six hours prior to surgery. (You may take sips of water up until 2 hours before the operation and you may take your medications with a sip of water). You must not chew gum or smoke on the day of the operation.

Medications

- If you are on blood thinners such as Aspirin, Warfarin, Plavix, Iscover, Clopidogrel, Pradaxa, Dabigatran, Rivaroxaban or anti-inflammatory drugs (Brufen, Mobic, Voltaren, etc), they can cause bleeding during surgery. We will advise you about what to do with these drugs prior to surgery. You must let us know about these drugs and the decision to stop them is based on each individual patient's needs.
- Diabetic medications: we will give you advice on whether to take your diabetic medications on the morning of surgery or not. Some diabetics will be admitted the night before the operation.
- If you are on Prednisone, you should not stop this drug suddenly.
- Cholesterol lowering medication should not be taken when you are fasting.
- If you are taking any alternative medications e.g. St John's Wort, fish oil or garlic, you should stop these tablets one week before surgery as they may result in excess bleeding.
- You may continue to take a multivitamin.
- Continue to take all other medications, even on the morning of surgery with a small sip of water.

Other things to know

- You must bring all relevant x-rays to the hospital with you.
- If you smoke, it is in your best interests to stop completely as soon as you can. See your GP for alternatives or call Quitline (131848) if you wish to seek advice.
- You should also abstain from drinking alcohol 24 hours prior to any surgery.
- Bring all your current medications with you to the hospital.
- Bring comfortable pyjamas, personal toiletries, small change for newspapers etc.
- Do not bring large amounts of cash or valuables.

WHAT WILL THIS SURGERY COST ME?

We largely work as 'no-gap' doctors. This means that the surgeon fee for your operation will be sent to your health fund and there will be no 'gap' or extra amount of money to pay. There are always exceptions and decisions regarding this are made on a case-by-case basis.

If you do not have private health insurance or if you have overseas insurance, you will be given a quotation for surgery, anaesthetic and hospital fees and must pay in full *prior* to the operation.

Outpatient consultations are not covered by the health funds and there will be a charge for these meetings if your surgery is elective. You will get a proportion of this money back from Medicare. There is no fee to be paid for normal care after the operation.

There may be other out-of-pocket fees from your anaesthetist and any other specialists who are asked to look after you. You should ask them ahead of time any out-of-pocket costs. Ask us who will be performing your anaesthetic and you can make enquiries with them.

There may be extra costs for x-ray, pharmacy and pathology. Intensive Care is usually billed straight to your health fund with no more to pay.

You have a right to gain 'Informed Financial Consent'. Fees from other practitioners are beyond our control and you should ask for the costs from each person who is asked to look after you. Patient's have a choice when it comes to paying for their health care and you are fully within your rights to negotiate and shop around.

If you have come from out of town, you will usually be flown to Brisbane in an air ambulance. Your family will usually be responsible for their own accommodation, hotel, meal and transport costs. There is some monetary assistance available for private patients through the Patient Travel Subsidy Scheme (PTSS) providing assistance to patients and in some cases their carers, to enable them to access specialist medical services that are not available locally. Please see Queensland Health's Patient Travel Subsidy Scheme site for details. <http://www.health.qld.gov.au/iptu/html/ptss.asp>. Greenslopes Hospital web site has an extensive list of hotels available in the local area. <http://www.greenslopesprivate.com.au/For-Visitors/off-site-accommodation.aspx>.

ABOUT YOUR SURGEON

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