INTRODUCTION
Spinal arthroplasty refers to the replacement of an intervertebral disc with an artificial metal and plastic prosthesis. It is also known as a total disc replacement. The prosthesis allows motion between the vertebrae to be maintained. The prosthesis is initially held in place by screws, fins or press fitting. Over time, bone will grow into the porous ends of the prosthesis to lock it into position. Sometimes, the prosthesis can not be inserted during the operation, in which case an intervertebral fusion will be done. When compared with other cervical disc disease operations, the arthroplasty has the advantages of not requiring painful bone graft harvesting or foreign bone substitutes with infection risks, requires less post-operative immobilization, no risk of post-operative spinal deformity, and less wear on the joints immediately above and below the arthroplasty. Best results are achieved with clients who have motion at the involved intervertebral disc, but no hyper mobility or instability.

INDICATIONS
If the diseased bone or intervertebral discs in the neck are causing neck pain, or are placing pressure on the spinal cord or the nerve roots leaving the spinal cord, and causing pain, weakness or numbness in the arms or legs, then surgery is indicated.

ALTERNATIVES
| The non-surgical alternatives to arthroplasty may be |
| activity modification |
| weight loss |
- aerobic exercise, such as walking, cycling, and swimming
- strength and flexibility exercises
- physical therapy
- hydrotherapy
- heat and cold pads
- acupuncture
- pain-relieving medications such as acetaminophen or paracetamol, non-steroidal anti-inflammatory drugs, glucosamine, chondroitin

The surgical alternatives to arthroplasty may be
- steroid and local anesthetic injections
- surgical fusion.

INFORMED REFUSAL
It is your right to delay or refuse the recommended treatment for your condition. However, this delay or refusal may lead to the worsening of your symptoms, such as increased neck pain, arm pain, pins and needles, weakness or numbness. You should ask your doctor what might happen should you chose not to undertake the recommended treatment.

BEFORE
Before the arthroplasty
- a doctor will perform a medical examination and any necessary tests to ensure that your general health will permit an anesthetic to be given and the procedure to be performed
- you will be advised when to stop any medications that will increase your bleeding risk ie aspirin, non-steroidal anti-inflammatories, anti-coagulants, vitamin E, glucosamine and some herbal medicines (including chamomile, danshen, garlic, gingko, devil’s claw, ginseng, fish oil, willow bark, feverfew, goji berries)
- you may be admitted into the hospital on the day before or on the morning of the procedure
- don’t eat or drink anything for six eight hours before the procedure
- wear loose-fitting clothes that are easy to take off and put on. Do not wear any jewelry.
- before the procedure, the skin on your neck will be cleaned and you will be given a general health check. The skin on your neck may be shaved.
- an intra-venous line will be placed into a vein in your arm to administer fluid and medications
- you may be given a sedating medication to make you drowsy before being given your anesthetic
you will be given a general anesthetic that will put you to sleep
- let your doctor know if you develop a fever, cold or flu symptoms before your scheduled procedure.

GOALS
The goals of an arthroplasty are to provide significant, long-term pain and neurological symptom relief by replacing a degenerate painful disc, by restoring the disc height to protect the spinal cord and spinal nerves and prevent further facet joint degeneration, and by preserving motion to prevent accelerated degeneration of the adjacent healthy discs.

TECHNIQUE
You will be lying on your back. Your neck will be cleaned. An incision will be made and the overlying muscles moved to the side. Any Your windpipe (trachea) and gullet (esophagus) will be retracted with the muscles to reveal the front of the spine. Any anterior vertebral body bone spurs (lipping, osteophytes) will be trimmed. Your surgeon will confirm the correct disc for removal by using x-ray imaging. Pins will be used to open up the collapsed disc space to regain normal spine alignment. The disc will be removed. The vertebral surfaces will be prepared, and the artificial disc inserted. X-rays will be used to check the prosthesis’ position. The muscles will be replaced, and the wound closed with sutures.

NO SMOKING
Smoking damages every part of your body and decreases the chance of a successful procedure. If you smoke, you should make every effort to stop now.

EXPECTATIONS
The expectations of a cervical arthroplasty are -
- the procedure will take two to three hours
- ninety percent of clients report a good or excellent relief of pain. There may or may not be improvement in neck pain.
- numbness is usually slow to recover, and some numbness may persist permanently
- weakness may persist for six to twelve weeks
- pins and needles usually begins to decrease immediately after the operation, but there may be brief recurring symptoms during the first few weeks
- there will usually often be some remaining neck pain after the arthroplasty from pre-existing degenerative disease elsewhere in the neck.

REHABILITATION/postoperative care
- you will spend about an hour in the recovery room
- you may spend the first night in the high dependency unit before being taken to your ward bed
- you will spend two to five nights in hospital
- your bowels won't may not open for a few days after the procedure due to the effect of pain medication
- use your prescribed pain medication, muscle relaxers and laxatives as directed
- non-steroidal anti-inflammatory medication is often prescribed for four weeks to reduce the risk of bone forming across the prosthesis and fusing the adjacent vertebral bodies together
- you must avoid bending, lifting, twisting and sudden movements. Don’t lift anything heavier than a milk carton for two weeks. Most people can resume their normal daily activities after three weeks
- walking is the only exercise permitted in the first six weeks.
- your clinician will specify when you can start your daily exercise program. A physical therapist will guide you through the exercise program
- check your wound twice a day. If you notice any redness, swelling, green or yellow discharge, or opening of the wound, see your family doctor immediately
- you may have small bandages called steri-strips on your incision. Keep these dry. These can be removed when they begin to peel off by themselves. Otherwise external sutures will be removed in one to two weeks.
- you should keep the wound dry. Otherwise showering is permitted, but avoid baths, swimming and creams for one week. The incision may be cleaned gently using regular soap and water. Only rub gently and don’t use perfumed soaps.
- you should keep the wound dry. Showering is permitted, but avoid baths, swimming and creams for one week. The incision should be cleaned gently using regular soap and water. Only rub gently and don’t use perfumed soaps. You will have small bandages called steristrips on your incision. These can be removed when they begin to peel off by themselves.
- you may be able to return to light sedentary work in six weeks
- you should be able to return to work in two to six weeks, depending on your type of work
- you should have your wound reviewed by your doctor one week after the procedure
- a follow-up appointment with your clinician will be booked for six weeks after the procedure.
ON-GOING CARE
You have a weak spot in your neck, and surgery can never return it to full strength. You will need to engage in lifelong neck care to reduce the risk of further neck problems. You should always maintain correct posture, lose any excess body fat, continue your daily exercise program and avoid unnecessary stresses on your neck.

POTENTIAL COMPLICATIONS OF A CERVICAL ARTHROPLASTY

ALLERGIC REACTION TO MEDICATION
An allergic reaction to the medications used can occur. This can cause a rash, swelling of the eyelids, hands, joints and throat, difficulty breathing, low blood pressure and death. These reactions are easily controlled with the right equipment and medications.

AIRWAY PROBLEMS
Neck surgery can cause trauma to the upper airways, resulting in bruising and swelling. This can lead to obstruction of the airway, difficulty with breathing and death. It can always be treated in the hospital. Should it occur, you will require a couple of days of close observation after the operation, before being moved back to the general ward.

ANESTHESIA
Anesthesia is used so you will feel no pain during the procedure. Anaesthesia can be
Local – where the medication is injected into the skin around the site of the surgery to numb only surrounding tissues.
Regional – where the body part is anesthetized by numbing a major nerve or part of the spinal cord.
Conscious sedation – where a full anesthetic is not given, rather, medications are used to create a near-sleep relaxed state.
General – where you are rendered unconscious and temporarily paralyzed. In this instance, medication is given to you through an IV line, and machines breath for you and monitor you, along with your Anesthesiologist. Most spinal operations require general anesthesia, so that you won’t move during the operation.

There are many possible complications from a general anesthetic.
Common complications (1-10% of general anesthetics) include
- post-operative nausea and vomiting – due to operation, anesthetic and pain-relieving drugs. May last a few hours to several days, but can be treated with medication.
- aches – due to lying still on a firm operating table for a long time.
- blurred vision, dizziness – due to low blood pressure from fluid loss or medications. Can be treated with fluid replacement and medications.
- bruising/pain – around injection and intravenous cannula sites. Usually settles by itself. Cannula can be moved if necessary.
- headache – due to the operation, the anesthetic, dehydration or anxiety. May last a few hours, but can be treated with medication.
- itchiness – due to an allergic reaction to drugs, sterilising fluid or sutures, or as a side effect of strong pain-relieving medication (opiates).
- memory loss/confusion – more common in older people who have had a general anesthetic. There are many causes, and may last a few days or weeks.
- pain from drug injection – some drugs cause pain when they are injected.
- shivering – caused by medications, stress or low body temperature during the surgery. Can be treated with a hot-air blanket.
- sore throat – from the breathing tube in your throat. May last a few hours to a few days. Can be treated with pain-relieving lozenges.

Uncommon complications (0.1% of general anesthetics) include
- anesthetic awareness – if you are ill, your Anesthesiologist may use more muscle relaxants and less general anesthetic to reduce your anesthetic risks. However this may lead to you being aware of your body and your surroundings during the operation. Anesthesiologists use monitors to observe your body’s reactions and adjust the medication doses. If you think you have been aware during the operation, your Anesthesiologist will want to know afterwards.
- bladder problems – depending on operation and medications, men may find it difficult to urinate, while women tend to leak urine after the operation. If necessary, a urinary catheter is used to drain the bladder until control returns.
- chest infection – may lead to breathing problems, but can be treated with antibiotics. More likely to occur in people who smoke.
- lip, teeth, tongue injury, jaw dislocation – can be caused by difficulty placing the breathing tube, or by clenching your teeth as you recover from the anesthetic.
- muscle pain - can be caused by a muscle relaxing drug (suxamethonium) used during emergency surgery if there may be food in the stomach, to prevent vomiting.
- slow breathing - can be due to some pain-relieving drugs or muscle relaxants. Can be treated with medications.
- worsening of existing medical condition - your Anesthesiologist will monitor your body closely and act to eliminate or reduce any medical complications.
- Very rare complications (0.0005 to 0.01% of general anesthetics) include
d - death - is very rare, and usually occurs when four or five complications occur simultaneously. Death from anesthesia occurs at one every 200,000 anesthetics.
- equipment failure - vital equipment can fail, but this is very rare, and monitors give immediate warnings.
- eye damage - eyelids are taped shut while you are asleep, to protect your eyes. Rarely, sterilising fluid may leak under the eyelids, or you may rub your eyes while waking from the anesthetic. Any discomfort is usually temporary.
- nerve damage - stretch, compression, incision or puncture. Usually recovers within three months.
- serious allergic reaction to medication - are noticed and treated quickly, but can very rarely cause death, even in healthy people.

You should discuss these with your Anesthesiologist.

ARTERY INJURY - CAROTID
The carotid artery is in the front of the neck. Although injury to the carotid artery is uncommon, it can be caused during retraction or incision to access the anterior cervical spine. Injury can lead to thrombosis (blockage in the artery), hemorrhage (bleeding from the artery) or thromboembolism (blood clot passing up the artery). All can lead to inadequate blood supply to the brain and stroke. Lacerations can be repaired during surgery. This complication is very rare.

ARTERY INJURY - VERTEBRAL
The vertebral artery passes close to the vertebral bodies in the neck. Injury during surgery is uncommon, and may be repairable, or may require blocking of the artery. Usually, there are no further problems. However, in rare instances, emboli from the repair, or the decreased blood
supply from the blockage, can lead to permanent brain damage. This complication is very rare.

**ARTERY PERFORATION** (see above)
Arteries are large blood vessels that can carry blood under pressure throughout the body. Your doctor will be very careful to avoid injuring arteries near your operation site. An artery perforation can result in significant bleeding and blood loss. This is very uncommon. If an artery is perforated, the artery can usually be repaired and the lost blood can be replaced by a blood transfusion. A specialist vascular surgeon is often asked to repair arteries. Late consequences of artery injury include fistula, hemorrhage, pseudo-aneurysm, thrombosis and emboli.

**ARTERY THROMBOSIS** (see above)
Arteries are large blood vessels that carry blood throughout the body. Sometimes they need to be moved to the side or compressed to allow access to the operation site. This pressure can lead to a clot forming within the artery, a process known as thrombosis. This is most likely in older patients with pre-existing blood vessel disease. A large clot can block the artery, while a small clot can dislodge, becoming an embolus, which travels and eventually blocks a small artery. Blocked arteries lead to insufficient blood flow, or ischemia in the tissues supplied by the artery. This can cause damage to these tissues, which may be permanent, depending on the duration of the blockage. Ischemia in the brain can cause a stroke. In the spinal cord it can cause paralysis and altered sensation. In the legs, it can cause pain and gangrene.

**CEREBROSPINAL FISTULA**
A tear in the dura, which contains the spinal cord and the cerebrospinal fluid, can allow cerebrospinal fluid to leak out through the wound, and onto the skin. This is called a cerebrospinal fistula. It may cause headache when standing, back or limb pain, nausea, vomiting, dizziness, ringing in the ears or eye pain from bright light. There is a risk of infection and meningitis. The dural tear may reseal spontaneously, or it may require bed rest, a blood patch procedure, drainage, or surgery to repair.

**DEATH**
No surgeon can guarantee a risk-free operation. All operations have some risks. Some risks are minor inconveniences, while some are major disabilities. The risks increase with repeat operations on the same area of
your body. Your entire medical staff will do their best to eliminate all risks to you, before, during and after your surgery. However sometimes, even after the surgery goes well, serious problems can arise that can result in death. These include pneumonia, pulmonary emboli, heart attack and stroke. You should discuss these risks with your Surgeon and your Anesthesiologist.

**DEEP VEIN THROMBOSIS**

A blood clot that forms inside the large deep veins of the legs is called a deep vein thrombosis, or DVT. Any surgery can put you at an increased risk of deep vein thrombosis because the blood’s clotting mechanism is switched on by the body trying to stop the bleeding associated with the operation. As well, injury to blood vessels, immobility and anesthetic effects during and after the surgery make it easier for clots to form and grow. Also some people have additional DVT risks such as age greater than fifty years, varicose veins, previous heart attack, cancer, atrial fibrillation, ischemic stroke, diabetes, previous DVT, heart failure, combined oral contraceptive pill use, smoking, obesity, leg weakness, and inherited clotting abnormalities. You should tell your doctor if you think you have any clotting problems.

A DVT can cause two problems. It blocks the blood flow from the legs back to the heart, causing swelling of the legs and pain. If the clot doesn’t dissolve properly, the swelling and discomfort can become permanent. Secondly, and more seriously, a part of the clot in the leg can break off and travel up the veins to the lungs, where it blocks the smaller lung blood vessels and stops the blood flow. This is called a pulmonary embolus, or PE. If the PE is large enough or there are many of them, it can cause death. It is important to minimize your risk of deep vein thrombosis and pulmonary embolism. Two preventative techniques are used. The first applies mechanical means to increase the blood flow through the legs, and includes support stockings, sequential compression devices, leg exercises in bed, and getting out of bed as soon as possible. The second technique uses chemical means to slow down the blood’s clotting process. These include heparin and coumadin. However medications that thin the blood to prevent clotting will also increase the risk of bleeding and hematoma formation. Your doctor will discuss the use of these medications with you. It is normal to use some method to minimize clot formation during and immediately after spinal surgery.

**DISC FAILURE**
The arthroplasty operation uses an artificial disc that is made from plastics and metals. It has been thoroughly tested on machines and used in many thousands of patients, and been shown to be rugged and durable. Rarely, the artificial disc may wear abnormally, break or migrate from its correct position. This can cause or risk causing pain, injury to adjacent tissues or mal-alignment (of bones) and may require a second operation to remove or replace the disc.

**DISC MISPLACEMENT**
Spinal arthroplasty operations use artificial discs to replace the damaged intervertebral disc. Your surgical team uses all available equipment and techniques to ensure the artificial disc is placed in the best possible position. Rarely, because of anatomical variations, equipment limitations or system failures, the discs are not optimally placed, and a further procedure may be required depending upon the results of the initial procedure.

**DUROTOMY**
The dura is a thin layer of tissue that forms a sac containing the brain, spinal cord and nerve roots. The sac is filled with cerebrospinal fluid or CSF. The dura can be torn during spinal surgery leading to a leak of the fluid from the sac. This complication is more difficult to avoid during repeat surgery at the same location, or when operating on severe spinal narrowing or a large disc herniation. A dural tear with the leakage of cerebrospinal fluid, can cause a headache when standing, back or limb pain, nausea, vomiting, dizziness, ringing in the ears or eye pain from bright light. A continuing leak can lead to a cerebrospinal fluid cyst under the skin, or a leakage of fluid from the wound. Dural tears can reseal spontaneously, or it may require bed rest, a blood patch procedure, drainage, or an additional operation to repair.

**DYSPHAGIA**
The esophagus connects the throat with the stomach. Difficulty swallowing food or water, called dysphagia, is a common problem after anterior cervical spine surgery. It may be due to stretching of the esophagus or injury to the nerves that control it. Symptoms are usually mild and temporary, but can take over a year to resolve. Rarely a procedure called a dilation may be required.

**DYSPHONIA**
Dysphonia is a voice disorder, usually involving hoarseness or difficulty generating sound for the voice.
The voice is created when the brain sends messages down specific nerves to the breathing, laryngeal, tongue, lower jaw and soft palate muscles. Injury to any of these nerves or tissues can affect the voice production. During any surgery, the vocal cords or nerve can be inflamed by the breathing tube. This usually settles over a couple of days. During anterior spine surgery, the nerves in the neck can be stretched or torn. Depending upon the cause, symptoms may be mild and resolve in weeks or months, or may take up to a year to resolve. In some cases they will not resolve at all.

**EPIDURAL HEMATOMA**
If bleeding occurs into the epidural space around the spinal cord, it may form a collection of blood, called an epidural hematoma. If the hematoma is large, it can compress the spinal cord and nerve roots leading to pain, weakness, numbness and bowel and bladder problems. A surgical procedure may be required to stop the bleeding and remove the hematoma.

**ESOPHAGEAL DYSFUNCTION**
The esophagus connects the throat with the stomach. During anterior cervical spine surgery, the esophagus is moved to the side to allow access to the front of the spine. Sometimes it is bruised, or the nerves controlling it are stretched. This can lead to difficulty swallowing after the procedure. This usually settles over a month or two. This is usually temporary, but can sometimes be long term.

**ESOPHAGEAL TEAR**
The esophagus connects the throat with the stomach. Very rarely it can be cut or torn during anterior cervical spine surgery. It can be cut or torn during anterior cervical spine surgery, or worn through later by implanted hardware, bone or cement. An esophageal tear can cause difficulty and pain with swallowing, shortness of breath, neck swelling, infection, and esophageal scarring. Tears can be treated by no food or water by mouth, intravenous antibiotics and fluid, and surgical repair. Hardware may need to be removed if there is a risk of infection.

**EYE INJURY**
During the general anesthesia, all care is taken to protect your eyes. They will be taped closed to reduce the risk of drying or scratching the surface of the eye. Should this happen, it usually heals over a day or two. A more serious, and much more rare complication is blindness from pressure on the eyeball or decreased blood
flow through the eye, known as ischemic optic neuropathy. Blindness due to ION is a 0.1% risk, and is associated with emboli, prolonged spine surgery in patients greater than seventy years old, prone (face down) position, diabetes, intra-operative blood loss/hypotension, and ankylosing spondylitis (poor position because of neck deformity). Your Anesthesiologist will do all they can to eliminate risk of these problems.

HEMATOMA
During any surgery, some blood vessels will be cut. Your surgeon will stop all significant bleeding before suturing the wound shut. Sometimes bleeding recommences after the operation, forming a collection of blood in the tissues, called a hematoma. The hematoma can cause pain, pressure on adjacent tissues or become infected. It may need to be removed by inserting a drainage tube or performing a surgical operation.

HEMORRHAGE
During surgery, blood vessels must be cut to access the desired location in your spine. Your surgeon will plan the surgical route to avoid large blood vessels, and will ensure bleeding has stopped before finishing the operation. Sometimes, one of these cut blood vessels begins re-bleeding after the operation. If the amount or location of the bleeding is causing you a problem, your surgeon may need to perform a further procedure to stop the bleeding and remove the accumulated blood.

HORNER'S SYNDROME
Injury to the sympathetic nerves in the neck can cause Horner's Syndrome on the same side. Horner's Syndrome refers to drooping of the upper eyelid, slight elevation of the lower eyelid, constriction of the pupil and dryness of the face on the same side. Depending on where the injury is located, some patients also have decreased flushing and sweating on that side of the face. The likelihood of recovery depends on the cause.

INFECTION
Infections occur in less than one percent of spinal operations. If the wound becomes more painful or tender, red, hot or swollen, oozes a clear or yellow fluid and doesn’t heal, or if you have fever or chills, the wound may be infected. Your Surgical Team will use sterile instruments, aseptic techniques, antibiotics and regular wound care to minimize this risk. Infections can be: superficial, involving the skin. These infections usually respond to oral antibiotics and washing the site.
Sometimes the wound needs cleaning and re-suturing in the operating theatre. Deep, involving the vertebrae or spinal cord. This is more serious and may require intravenous antibiotics, and further operations to drain the infection. Rarely, infected bone graft or hardware may need to be removed. Wound infections are more likely if you smoke, have diabetes, are overweight, or if the wound took a while to heal or there was a hematoma. If you have any concerns, you should contact your doctor immediately.

**MALIGNANT HYPERTHERMIA**

Malignant hyperthermia is a rare life-threatening condition that is triggered in genetically-predisposed people by some drugs used for general anesthesia. In susceptible people, the drugs cause an uncontrolled increase in skeletal muscle calcium levels and muscle contraction, leading to decreased blood oxygen and increased blood carbon dioxide and body temperature. This can lead to circulatory collapse and death if not quickly treated. Susceptible people may have multiple episodes of anesthesia without developing malignant hyperthermia. Symptoms usually develop within one hour of drug administration. There is no simple test to diagnose susceptibility to malignant hyperthermia. It is usually found during drug administration or suspected if a family member develops the symptoms. While treatment is effective, if you or a family member have experienced malignant hyperthermia, you must avoid the potential trigger drugs. There are safe alternative medications available.

**NECK PAIN**

Neck pain after the procedure is to be expected. This may be similar or different to the original neck pain. It is usually temporary. Sometimes the original neck pain can persist, or it can be worse.

**NERVE INJURY - CERVICAL**

Because the vertebrae surround the spinal nerve roots and spinal nerves, operations on the vertebrae can injure the nerve roots within the spinal canal or the spinal nerves as they leave the spinal canal through the intervertebral foramen. The nerves can be bruised, stretched, torn or cut while accessing or repairing the damaged vertebra. Locating, protecting and mobilizing the spinal nerves are the most difficult and time-consuming part of most spine surgeries. Your surgeon will be very careful to avoid any injury to the spinal nerves and nerve roots. If a nerve is injured, it can cause pain as well as temporary or
permanent, partial or complete, loss of sensation or movement in your arm.

NERVE INJURY - C5
Injury to the C5 nerve root can occasionally happen after cervical surgery laminectomy or laminoplasty. Symptoms usually occur in the first week, but sometimes up to one month after the surgery. This nerve root is shorter than the other nerve roots, and is often in the middle of the operation site and subject to the greatest stretch during the operation. The C5 nerve root is the only nerve supply to the deltoid muscle on the shoulder, so injury to the nerve root leads to an obvious weakness of this muscle and difficulty raising the arm to the side. Weakness in bending the elbow, and pain or numbness over the deltoid may also be present. In addition, if the operation successfully restores the normal lordotic curve of the neck, this can allow the spinal cord to shift backwards in the spinal canal, and apply more stretch to the C5 nerve roots. At least partial recovery occurs over weeks to months, but it may take years.

NERVE INJURY - RECURRENT LARYNGEAL
The recurrent laryngeal nerves in the neck can be damaged by incision, pressure or stretching during anterior spinal surgery. The symptoms can include hoarseness, voice fatigue, weak or persistent cough, inhaling fluid and difficulty swallowing. Depending upon the cause, symptoms may be mild and resolve in weeks or months, or may take up to a year to resolve, if at all.

NERVE INJURY - ULNAR
While under anesthesia, your body will be immobilized in a certain position to allow access to the injured region, and to keep your arms out of the way. Sometimes the ulnar nerve in your arm can be inadvertently compressed or stretched at the elbow, leading to pain, numbness or weakness in the hand after the procedure. These symptoms can appear one to four days after the procedure, and usually disappear over a few weeks. Your medical and nursing staff will take all care to minimize risk of this complication.

PERFORATION
There are a number of important structures next to your operation site. These include the spinal cord and nerves and their cover – the dura, and arteries and veins. Depending upon the site of your surgery, they also include the intestine in the abdomen, the lungs in the chest, and the esophagus and trachea in the neck. Your doctor will take every care to protect these structures,
but they can be accidentally perforated during the procedure. If they are injured, they will be repaired as best as possible.

PRESSURE SORES
Prolonged lying down during the procedure and the post-operative recovery can lead to skin pressure sores over prominent bones. Your medical and nursing staff will carefully place, pad and move you, to prevent this occurring.

QUADRIPLEGIA
The spine surrounds and protects the spinal cord. Surgery to the cervical spine can damage the cervical spinal cord. Damage to the cervical spinal cord can cause loss of movement and sensation in the torso and limbs, known as quadriplegia or tetraplegia. Quadriplegia may be complete, with no movement or sensation below the level of the spinal cord injury, or incomplete with some movement or sensation. Quadriplegia may involve impairment of movement and sensation of the limbs and torso, urinary and fecal incontinence, impotence and digestion and breathing difficulties. Quadriplegics may require the use of urinary catheters and a bowel management program (suppositories, enemas, digital stimulation). Quadriplegics are at increased risk of pressure sores, osteoporosis, fractures, frozen joints, thrombosis, respiratory infections, pneumonia and cardiovascular disease. Your surgeon and staff will take the utmost care to protect your spinal cord during and after your procedure.

RESIDUAL PAIN
Some pain remaining after the procedure is very common. Surgery can not restore the spine back to a pre-diseased state. Some pain should be expected to come from the area of the operation. In addition, pain from adjacent areas already damaged by the disease, or by their own degenerative problems will most likely continue. Usually any residual pain is mild, but it may be severe or even worse than the original problem.

URINARY TRACT INFECTION
While under a general anesthetic during the surgery, and when confined to bed after the surgery, you will not be able to go to the toilet to urinate. A urinary catheter will be passed along your urethra to freely drain the bladder and avoid bladder discomfort. The presence of a urinary catheter does increase the risk of bacteria entering the bladder and causing a urinary tract
infection. Treatment usually requires the catheter to be removed, followed by a course of antibiotics.

This article was written with the assistance of the following surgeons:

Dr Paul Licina. Dr Licina is spinal orthopedic surgeon, and co-founder of Brisbane Orthopaedic Specialist Services in Brisbane, Queensland, Australia. www.brisbaneorthopaedics.com.au/paul_licina.html

Dr Matthew McDonald. Dr McDonald is a spinal neurosurgeon based at Wakefield Hospital, Adelaide, South Australia, Australia. www.wakefieldneurosurgery.com.au

Dr Richard Parkinson. Dr Parkinson is a spinal neurosurgeon based at St Vincent’s Clinic, Sydney, New South Wales, Australia. www.svph.com.au/index.php?option=com_content&task=view&id=145&Itemid=178

Dr Lali Sekhon. Dr Sekhon is a spinal neurosurgeon, and founder of Nevada Neurosurgery in Reno / Carson City, Nevada, USA. www.nevadaneurosurgery.com