# MARINER® MIS

## MINIMALLY INVASIVE POSTERIOR FIXATION

PATIENT INFORMATION LEAFLET

SeaSpine

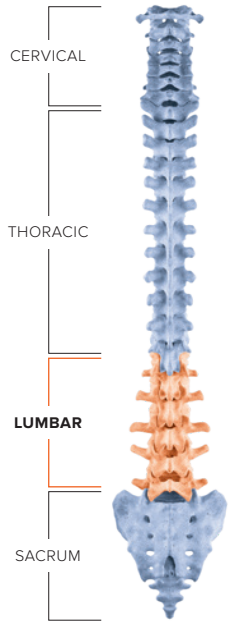
DEVICE TECHNOLOGIES

# INTRODUCTION

The lumbar spine is made up of five bones called vertebrae. The bones and joints contain and protect the spinal cord, while also allowing motion such as, bending and twisting. The main joint between two vertebrae is called a disc. Each disc is comprised of two parts, a tough and fibrous outer layer (annulus fibrosus), and a soft, gelatinous centre (nucleus pulposus). These two parts play a vital role in allowing and restricting motion.

# WHAT IS CAUSING MY PAIN?

Age, genetics, injury, and everyday wear and tear caused by routine activities can contribute to damage and deterioration of the discs in your lower back. Your surgeon may have diagnosed a herniated disc, disc degeneration, spinal stenosis, or loss of disc height as compared to your other discs. Symptoms of these conditions can include loss of motor function and dexterity, tingling or numbness in the lower extremities, radiating pain, and weakness and/or numbness in your legs.




# WHAT IS A MINIMALLY INVASIVE POSTERIOR FIXATION?

Posterior Fixation for the lumbar spine is a surgical procedure that helps relieve pressure on the nerve roots and/or spinal cord to provide realignment, immobilisation, and stabilisation of spinal segments in skeletally mature patients. Compared to a traditional open procedure, the minimally invasive approach is performed through a minimal incision in your back, and the back muscles surrounding your spine are gently separated, rather than cutting through them. Decompression may be necessary if the symptoms are caused by a compression of the spinal cord and/or nerve roots. Once decompressed, your surgeon will use screws and rods to stabilise or fixate the affected vertebral bodies.

This technique may result in smaller scars, less postoperative pain, and a quicker recovery. Depending on your conditions and symptoms, minimally invasive surgery may or may not be the right procedure. It is important to discuss with your surgeon to recommend the right surgical solution for you.


Mariner® Posterior Fixation Spinal Implant

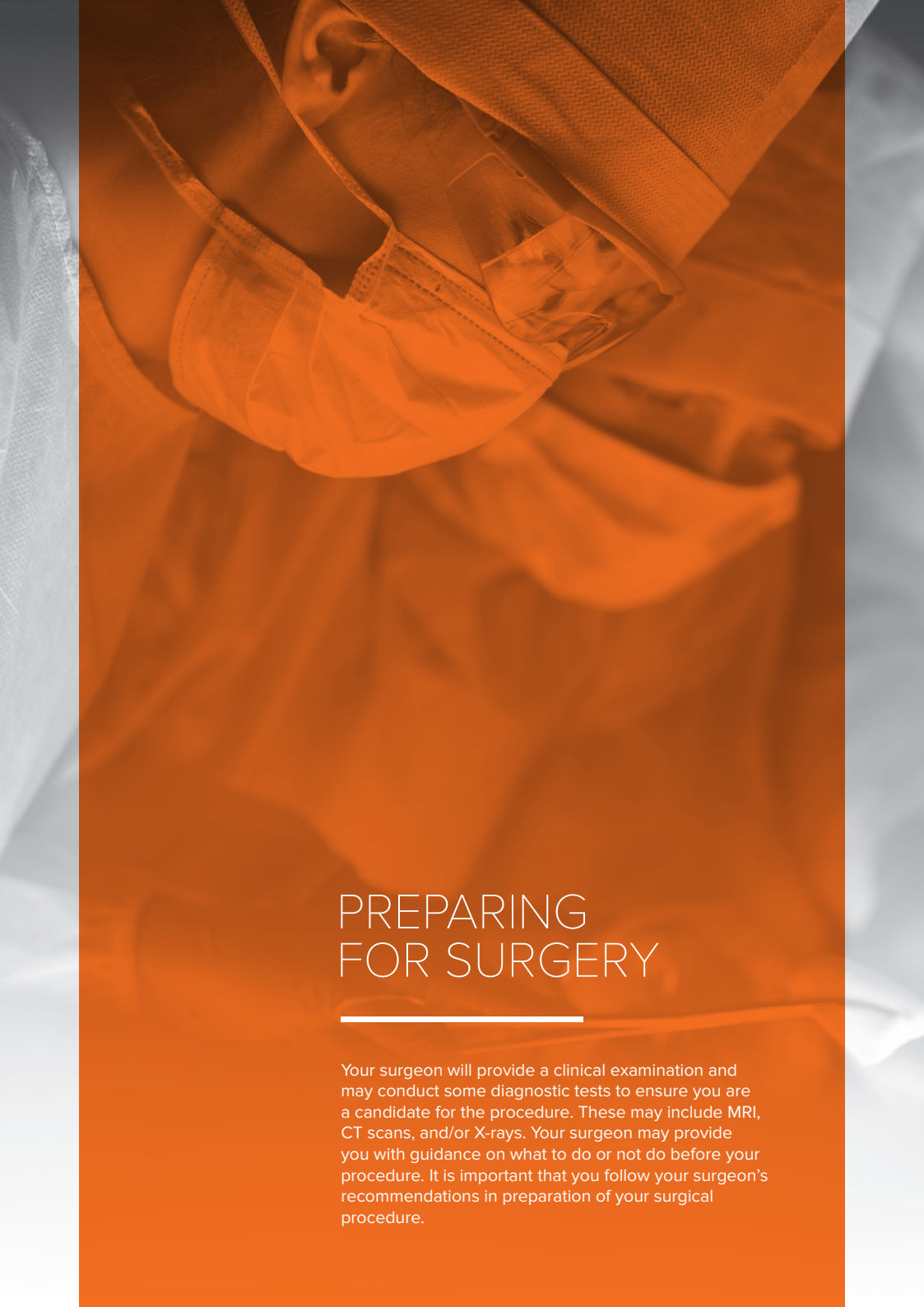
# IS MINIMALLY INVASIVE POSTERIOR FIXATION THE RIGHT PROCEDURE FOR ME?

Your surgeon may have suggested that you are a candidate for a Minimally Invasive Posterior Fixation procedure. Mariner® MIS is intended to provide stability of the spine, and is indicated for skeletally mature patients with Degenerative Disc Disease (DDD).

## DEGENERATIVE DISC DISEASE (DDD)

During the natural aging process, the disc between each vertebral body can lose their flexibility, height, and elasticity which can cause a tear in the tough outer layer of the disc, causing the disc to herniate, bulge, or leak the gelatinous core. The bulges or leakages can end up compressing the nerve roots and/or spinal cord, causing symptoms including, but not limited to lower back and/or leg pain.

**The Minimally Invasive Posterior Fixation may not be the right procedure for you. It is important to discuss with your surgeon your condition, and treatment options to establish the best treatment plan for you.**



# PREPARING FOR SURGERY

Your surgeon will provide a clinical examination and may conduct some diagnostic tests to ensure you are a candidate for the procedure. These may include MRI, CT scans, and/or X-rays. Your surgeon may provide you with guidance on what to do or not do before your procedure. It is important that you follow your surgeon's recommendations in preparation of your surgical procedure.

# WHAT TO EXPECT DURING SURGERY

### DURING SURGERY

After you are sedated, positioned face down, and surrounded by the appropriate surgical draping, an X-ray image is taken of your spine to identify the location of the operative disc space.

### STEP 1: APPROACH

Your surgeon will make a small incision down your back. The size of the incision can vary based on the number of levels and/or complexity of your case.

### STEP 2: DECOMPRESSION

Your surgeon may decide that decompression of the affected vertebrae and discs may be necessary to reduce pressure from the cord or symptomatic nerve root. During decompression, a small section of the bone and disc are removed to clear a pathway for the interbody spacer.

### STEP 3: STABILISATION OR FIXATION

Your surgeon will use a combination of screws and rods to stabilise or fixate the affected vertebrae. This combination will act as a stabilisation device (internal brace) to help hold everything in place while fusion occurs. Your surgeon will determine the appropriate fixation implant, if necessary.

### STEP 4: FUSION

With the completed construct tightened and locked down, your vertebral bodies will then be allowed to fuse. Fusion means the bone will grow around the affected areas and will eventually stabilize itself. This healing process can take various lengths of time depending on the severity of the condition.

**Your surgeon may discuss precautions in a less invasive manner than the traditional screw placement or other measures that could be taken to avoid potential risk.**

# WHAT TO EXPECT AFTER SURGERY

After surgery you will wake up in the recovery room, where your vital signs will be monitored, and your immediate postoperative condition will be carefully observed. Once the medical staff feels that you are doing well, you will be returned to your room in the hospital.

Your surgeon will determine the best postoperative course for you. The day after your surgery, your surgeon may instruct you to use a brace for a period of time to assist with the spinal fusion process. Supervised by trained medical professionals, your surgeon may ask you to carefully sit, stand, or walk. Your surgeon will also discuss with you any medications to take home, as well as a prescribed program of activities. Your surgeon will provide instructions on wound care, exercises, and limitations to postoperative activity.

# WHAT ARE THE POTENTIAL RISKS?

### POSSIBLE ADVERSE EVENTS

Like other spinal system implants, the following adverse events are possible. This list is not exhaustive.

- Delayed union or nonunion (pseudarthrosis).
- Bending, disassembly or fracture of implant and components.
- Loosening of spinal fixation implants may occur due to inadequate initial fixation, latent infection, and/or premature loading, possibly resulting in bone erosion, migration or pain.
- Pain, discomfort, or abnormal sensations due to the presence of the device.
- Pressure on skin where inadequate tissue coverage exists over the implant, with potential extrusion through the skin.
- Dural leak requiring surgical repair.
- Cessation of growth of the fused portion of the spine.
- Subsidence of the implant into adjacent bone.
- Loss of proper spinal curvature, correction, height and/or reduction.
- Increased biomechanical stress on adjacent levels.
- Improper surgical placement of the implant causing stress shielding of the graft or fusion mass.
- Intraoperative fissure, fracture, or perforation of the spine.
- Postoperative fracture due to trauma, defects or poor bone stock.
- Serious complications associated with any surgery may occur. These include, but are not limited to: wound complications, infection, genitourinary disorders, gastrointestinal disorders, vascular disorders, including thrombus; bronchopulmonary, disorders, including emboli; bursitis, hemorrhage, myocardial infarction, paralysis or death.

Should you experience any pain or other symptoms outside of what was discussed with your surgeon, please contact your surgeon immediately.

# TECHNICAL INFORMATION

SeaSpine® offers a wide range of rod materials to accommodate each patient's needs. With straight and pre-contoured rod options, there are rods available for the most complex cases. The different rod characteristics, such as rod stiffness, bending strength and springback will allow your surgeon to pick the correct rod for your case. Although rare, metal sensitivities and allergic reactions to foreign materials have been reported for orthopedic implant patients. The most common sensitivities, in order of their frequency, are to nickel, cobalt, and chromium. Implant sensitivity reactions to titanium and titanium alloy are much less common.

**IMPLANT MATERIALS**

- Titanium Alloy (Ti Alloy) – ASTM F136
- Cobalt Chrome (CoCr) – ASTM F1537
- Extra Strength & Stiffness (ESS) – ASTM F562
- Extra Strength & Stiffness + (ESS+) – ASTM F562

Although the Mariner® MIS system is intended to be kept in use for the lifetime of the patient, it is important to comply with your surgeon's postoperative instructions. Surgeons should advise patients to limit or restrict physical activity, especially lifting, twisting, or any type of sports participation. Your surgeon will provide clarity on the length of time to restrict physical activity, and any other postoperative warnings that you should abide by. Postoperative compliance is important for your recovery.

**This device has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration, or image artifact in the MR environment. The safety of this device in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.**

# MARINER® MIS

Mariner® MIS Implants

| PART NUMBER | PART DESCRIPTION |
|---|---|
| 41-1010 | Set Screw |
| 41-3010 | Polyaxial Head |
| 41-5010 | Deformity Head |
| 41-7010 | Trauma Head |
| 41-1250 | Straight Rod 6.0 x 250mm |
| 41-1450 | Straight Rod 6.0 x 450mm |
| 41-6010 | Extended Deformity Head |
| 41-8010 | Extended Trauma Head |
| 41-4525-2 | Cannulated Screw 4.50 x 25mm |
| 41-4530-2 | Cannulated Screw 4.50 x 30mm |
| 41-4535-2 | Cannulated Screw 4.50 x 35mm |
| 41-4540-2 | Cannulated Screw 4.50 x 40mm |
| 41-4545-2 | Cannulated Screw 4.50 x 45mm |
| 41-5530-2 | Cannulated Screw 5.50 x 30mm |
| 41-5535-2 | Cannulated Screw 5.50 x 35mm |
| 41-5540-2 | Cannulated Screw 5.50 x 40mm |
| 41-5545-2 | Cannulated Screw 5.50 x 45mm |
| 41-5550-2 | Cannulated Screw 5.50 x 50mm |
| 41-6530-2 | Cannulated Screw 6.50 x 30mm |
| 41-6535-2 | Cannulated Screw 6.50 x 35mm |
| 41-6540-2 | Cannulated Screw 6.50 x 40mm |
| 41-6545-2 | Cannulated Screw 6.50 x 45mm |
| 41-6550-2 | Cannulated Screw 6.50 x 50mm |
| 41-6555-2 | Cannulated Screw 6.50 x 55mm |
| 41-6560-2 | Cannulated Screw 6.50 x 60mm |
| 41-7530-2 | Cannulated Screw 7.50 x 30mm |
| 41-7535-2 | Cannulated Screw 7.50 x 35mm |
| 41-7540-2 | Cannulated Screw 7.50 x 40mm |
| 41-7545-2 | Cannulated Screw 7.50 x 45mm |
| 41-7550-2 | Cannulated Screw 7.50 x 50mm |
| 41-7555-2 | Cannulated Screw 7.50 x 55mm |
| 41-7560-2 | Cannulated Screw 7.50 x 60mm |
| 41-8535-2 | Cannulated Screw 8.50 x 35mm |
| 41-8540-2 | Cannulated Screw 8.50 x 40mm |
| 41-8545-2 | Cannulated Screw 8.50 x 45mm |

# MARINER® MIS

Mariner® MIS Implants

| PART NUMBER | PART DESCRIPTION |
|---|---|
| 41-8550-2 | Cannulated Screw 8.50 x 50mm |
| 41-8555-2 | Cannulated Screw 8.50 x 55mm |
| 41-8560-2 | Cannulated Screw 8.50 x 60mm |
| 41-8510-2 | Cannulated Screw 8.50 x 100mm |
| 41-8511-2 | Cannulated Screw 8.50 x 110mm |
| 41-8570-2 | Cannulated Screw 8.50 x 70mm |
| 41-8580-2 | Cannulated Screw 8.50 x 80mm |
| 41-8590-2 | Cannulated Screw 8.50 x 90mm |
| 41-9510-2 | Cannulated Screw 9.50 x 100mm |
| 41-9511-2 | Cannulated Screw 9.50 x 110mm |
| 41-9535-2 | Cannulated Screw 9.50 x 35mm |
| 41-9540-2 | Cannulated Screw 9.50 x 40mm |
| 41-9545-2 | Cannulated Screw 9.50 x 45mm |
| 41-9550-2 | Cannulated Screw 9.50 x 50mm |
| 41-9555-2 | Cannulated Screw 9.50 x 55mm |
| 41-9560-2 | Cannulated Screw 9.50 x 60mm |
| 41-9570-2 | Cannulated Screw 9.50 x 70mm |
| 41-9580-2 | Cannulated Screw 9.50 x 80mm |
| 41-9590-2 | Cannulated Screw 9.50 x 90mm |
| MM1-115250 | MIS Straight Rod, 5.5 x 250mm |
| MM1-115450 | MIS Straight Rod, 5.5 x 450mm |
| MM1-125030 | MIS Precontoured Rod, 5.5 x 30mm |
| MM1-125035 | MIS Precontoured Rod, 5.5 x 35mm |
| MM1-125040 | MIS Precontoured Rod, 5.5 x 40mm |
| MM1-125045 | MIS Precontoured Rod, 5.5 x 45mm |
| MM1-125050 | MIS Precontoured Rod, 5.5 x 50mm |
| MM1-125055 | MIS Precontoured Rod, 5.5 x 55mm |
| MM1-125060 | MIS Precontoured Rod, 5.5 x 60mm |
| MM1-125065 | MIS Precontoured Rod, 5.5 x 65mm |
| MM1-125070 | MIS Precontoured Rod, 5.5 x 70mm |
| MM1-125080 | MIS Precontoured Rod, 5.5 x 80mm |
| MM1-125090 | MIS Precontoured Rod, 5.5 x 90mm |
| MM1-125100 | MIS Precontoured Rod, 5.5 x 100mm |
| MM1-125110 | MIS Precontoured Rod, 5.5 x 110mm |
| MM1-125120 | MIS Precontoured Rod, 5.5 x 120mm |

# MARINER® MIS

Mariner® MIS Implants

| PART NUMBER | PART DESCRIPTION |
|---|---|
| 41-1510-1 | Solid Screw 10.50 x 100mm |
| 41-1511-1 | Solid Screw 10.50 x 110mm |
| 41-1535-1 | Solid Screw 10.50 x 35mm |
| 41-1540-1 | Solid Screw 10.50 x 40mm |
| 41-1545-1 | Solid Screw 10.50 x 45mm |
| 41-1550-1 | Solid Screw 10.50 x 50mm |
| 41-1555-1 | Solid Screw 10.50 x 55mm |
| 41-1560-1 | Solid Screw 10.50 x 60mm |
| 41-1570-1 | Solid Screw 10.50 x 70mm |
| 41-1580-1 | Solid Screw 10.50 x 80mm |
| 41-1590-1 | Solid Screw 10.50 x 90mm |
| 41-2030 | Precontoured Rod 6.0 x 30mm |
| 41-2035 | Precontoured Rod 6.0 x 35mm |
| 41-2040 | Precontoured Rod 6.0 x 40mm |
| 41-2045 | Precontoured Rod 6.0 x 45mm |
| 41-2050 | Precontoured Rod 6.0 x 50mm |
| 41-2055 | Precontoured Rod 6.0 x 55mm |
| 41-2060 | Precontoured Rod 6.0 x 60mm |
| 41-2065 | Precontoured Rod 6.0 x 65mm |
| 41-2070 | Precontoured Rod 6.0 x 70mm |
| 41-2080 | Precontoured Rod 6.0 x 80mm |
| 41-2090 | Precontoured Rod 6.0 x 90mm |
| 41-2100 | Precontoured Rod 6.0 x 100mm |
| 41-2110 | Precontoured Rod 6.0 x 110mm |
| 41-2120 | Precontoured Rod 6.0 x 120mm |
| 41-2441 | Contoured Crossbar Small 6.0 Rod |
| 41-4241 | Contoured Crossbar Small 6.0 Rod |
| 41-4252 | Contoured Crossbar Medium 6.0 Rod |
| 41-4275 | Contoured Crossbar Large 6.0 Rod |
| 10200450 | Malleable Rod 5.5 x 450 |
| 10200500 | Malleable Rod 5.5 x 500 |
| 10200600 | Malleable Rod 5.5 x 600 |
| MM1-000020 | MIS Polyaxial Head |
| MC1-160060 | Cortical Shank Cannulated 6.0 x 50mm |

# MARINER® MIS

Mariner® MIS Implants

| PART NUMBER | PART DESCRIPTION |
|---|---|
| MM1-145030 | MIS Constrained Rod 5.5 x 30mm |
| MM1-145035 | MIS Constrained Rod 5.5 x 35mm |
| MM1-145040 | MIS Constrained Rod 5.5 x 40mm |
| MM1-145045 | MIS Constrained Rod 5.5 x 45mm |
| MM1-145050 | MIS Constrained Rod 5.5 x 50mm |
| MM1-145055 | MIS Constrained Rod 5.5 x 55mm |
| MM1-145060 | MIS Constrained Rod 5.5 x 60mm |
| MM1-145065 | MIS Constrained Rod 5.5 x 65mm |
| MM1-145070 | MIS Constrained Rod 5.5 x 70mm |
| MM1-146030 | MIS Constrained Rod 6.0 x 30mm |
| MM1-146035 | MIS Constrained Rod 6.0 x 35mm |
| MM1-146040 | MIS Constrained Rod 6.0 x 40mm |
| MM1-146045 | MIS Constrained Rod 6.0 x 45mm |
| MM1-146050 | MIS Constrained Rod 6.0 x 50mm |
| MM1-146030 | MIS Constrained Rod 6.0 x 30mm |
| MM1-146035 | MIS Constrained Rod 6.0 x 35mm |
| MM1-146040 | MIS Constrained Rod 6.0 x 40mm |
| MM1-146045 | MIS Constrained Rod 6.0 x 45mm |
| MM1-146050 | MIS Constrained Rod 6.0 x 50mm |
| MM1-146055 | MIS Constrained Rod 6.0 x 55mm |
| MM1-146060 | MIS Constrained Rod 6.0 x 60mm |
| MM1-146065 | MIS Constrained Rod 6.0 x 65mm |
| MM1-146070 | MIS Constrained Rod 6.0 x 70mm |
| MM1-156030 | MIS Precontoured Rod 6.0 x 30mm |
| MM1-156035 | MIS Precontoured Rod 6.0 x 35mm |
| MM1-156040 | MIS Precontoured Rod 6.0 x 40mm |
| MM1-156045 | MIS Precontoured Rod 6.0 x 45mm |
| MM1-156050 | MIS Precontoured Rod 6.0 x 50mm |
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| MM1-156065 | MIS Precontoured Rod 6.0 x 65mm |
| MM1-156070 | MIS Precontoured Rod 6.0 x 70mm |
| MM1-156080 | MIS Precontoured Rod 6.0 x 80mm |
| MM1-156090 | MIS Precontoured Rod 6.0 x 90mm |
| MM1-156100 | MIS Precontoured Rod 6.0 x 100mm |
| MM1-156110 | MIS Precontoured Rod 6.0 x 110mm |
| MM1-156120 | MIS Precontoured Rod 6.0 x 120mm |

# TGA & SEASPINE®

## CONTACT INFORMATION

**A notice that any serious incident that occurs in relation to the device should be reported to the manufacturer and to the TGA.** Any serious incident that occurs in relation to the device should be reported to SeaSpine® via phone, fax, or email. When possible, retain the product involved in the complaint and return to SeaSpine as instructed by SeaSpine Customer Service; Complaints@seaspine.com and the Therapeutic Goods Administration (TGA) www.tga.gov.au.

SeaSpine intends that this device should be used only by surgeons having received proper training in the use of the device.

This patient information leaflet has been designed to assist you in understanding a treatment option that your surgeon has advised may be suitable for you to treat your pain, and related problems. The aim of this leaflet is to provide you with information about one treatment option and how this may assist in alleviating your current pain and discomfort.

Reading this leaflet should not take the place of talking with your surgeon. Please read this leaflet in its entirety before your surgery and should you have any further questions ensure you discuss this with your surgeon before proceeding with your surgery.

As with any type of surgery, Minimally Invasive Posterior Fixation surgery carries risks. Your surgeon will discuss with you the risks associated with you prescribed procedure.

SeaSpine DEVICE TECHNOLOGIES

For more information or to place an order, please contact:
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Warning: Applicable laws restrict these products to sale by or on the order of a surgeon.



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