Endovascular stent grafts:
A treatment for
Abdominal Aortic Aneurysms
**Introduction**

This educational information is provided for physicians to use only when educating a patient about a stent graft system as a method for treating an Abdominal Aortic Aneurysm. Only a doctor can determine if a patient is a suitable candidate for a stent graft procedure.

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The aorta is the largest artery that carries blood away from the heart to the rest of the body. The abdominal aorta is the section of the aorta located in the abdomen. It begins just below the renal arteries and extends to where the aorta divides into the two common iliac arteries (see Figure 1).
What is an aneurysm?

An aneurysm is a bulge or balloon that forms in the wall of a blood vessel resulting from the weakening of the aortic wall (see Figure 2).

When the arterial wall of the aorta weakens as a result of age, disease or trauma, it may begin to bulge, causing what is called an Abdominal Aortic Aneurysm (AAA). As the aneurysm enlarges, the arterial wall weakens so that the aorta can rupture by the force from normal blood pressure, leading to massive internal bleeding. A ruptured aneurysm is a life-threatening condition requiring immediate medical attention.

What symptoms are associated with Abdominal Aortic Aneurysms?

Most people do not experience any symptoms indicating that they may have an Abdominal Aortic Aneurysm. During a routine physical examination, a doctor may notice or feel a throbbing pulsatile in the middle or lower part of a patient’s abdomen. However, most aneurysms are identified when diagnostic imaging testing (such as CT scan or ultra-sound scan) is performed for other reasons.

What are the risks factors that can contribute to Abdominal Aortic Aneurysms?

The risk of developing an AAA increases with age. Abdominal Aortic Aneurysms primarily affect people over 50 years old and are more common in men than in women. Other main risk factors include smoking and high blood pressure. Finally, a patient with a family history of AAA is at higher risk and should talk to a doctor about it.
OPEN SURGERY:
The surgeon accesses the aneurysm through an incision in the abdomen (see Figure 3). The aneurysmal portion of the vessel is replaced with a synthetic graft. The surgical procedure is often performed under general anaesthesia and takes about three to four hours to complete. Patients must typically spend one day in an intensive care unit and then remain in the hospital for at least one week. Patients may require two to three months for complete recovery.

ENDOVASCULAR STENT GRAFTING:
This is a minimally invasive procedure, where a stent graft, which is a synthetic tube graft supported by a metal skeleton, is placed inside of a diseased (aneurysmal) vessel without surgically opening the surrounding tissue through a small incision in each upper thigh area. The procedure usually takes about two hours. Hospital stay is reduced to two to four days and stay in the intensive care unit may not be necessary.

There are risks and benefits associated with both treatment options. Patients should talk with their doctor about which option is best.

What are the treatment options for repair of Abdominal Aortic Aneurysms?

An Abdominal Aortic Aneurysm is treated if the doctor feels there is a risk that the aneurysm will burst (or rupture). If so, two treatment options are available depending on the physician’s diagnosis: open surgery or endovascular stent grafting.
The stent graft procedure is performed using either regional, general or local anaesthesia. Prior to the procedure, a number of diagnostic tests are performed. These diagnostic tests allow the doctor to visualise the aneurysm and the surrounding area. To prepare for the procedure, a small incision is made in each upper thigh area. Using fluoroscopy (X-rays) for guidance, the delivery catheter is advanced through the large vessel in the patient’s thigh (iliac vessel) to the aneurysm site in the abdomen (see Figure 4).

When the delivery catheter is properly positioned inside the aneurysm, the stent graft is slowly released from the delivery catheter into the blood vessel, and it expands to a preset size. The delivery catheter is withdrawn and removed, leaving the stent graft within the vessel.

Depending on the shape and size of the aneurysm, additional stent grafts may be placed to ensure that the aneurysm is completely excluded. X-rays and/or intravascular ultrasound imaging procedures are often performed to allow the doctor to verify that the stent graft is properly placed within the aneurysm (see Figure 5).

The endovascular stent graft is designed to exclude the aneurysm and reinforce the weakened wall of the aorta. It reduces the risk of rupture by relieving the pressure on the aneurysm by providing a new pathway for blood flow. The stent graft is advanced and placed inside the blood vessels without surgically opening the surrounding tissues, using a delivery catheter a long thin tube used to transport and release the stent graft inserted through the groin, after which it is then removed from the body.

The delivery catheter is inserted through a vessel in the patient’s groin and pushed up to the abdominal aorta (see Figure 4).
Immediately after recovery from the stent grafting procedure, the physician may require the patient to lie flat for four to six hours to allow the leg wounds to begin healing. Some mild discomfort may be encountered at the place of the wounds in the groin. This usually settles within two days. Rare side effects may include swelling of the upper thigh, numbness of the legs, nausea, vomiting, leg pain or throbbing, lack of appetite, fever, and/or absence of bowel movement for one to three days.

Endovascular stent grafting requires periodic maintenance to detect any possible complications.

When should a doctor be called?

If a patient experiences any of the following symptoms, contact his or her doctor immediately:

- Pain, numbness, coldness, or weakness in the legs or buttocks.
- Any back, chest, abdominal or groin pain.
- Dizziness, fainting, rapid heartbeat or sudden weakness.

A doctor should also be called if the patient is required to reschedule a follow-up visit for any reason.

This information booklet is not intended as a substitute for a thorough discussion between a physician and patient about the advisability of this procedure.

Possible discussion points include:

- What are the other options for treatment of Abdominal Aortic Aneurysms?
- Which stent grafts are approved for treatment of Abdominal Aortic Aneurysms?
- What are the risks (including rupture) with a stent graft?
- Will health insurance pay for part or all of the cost associated with this procedure?
- After the procedure, how often must a physician follow up with the patient, and which types of tests will need to be performed?
- Does a patient have to limit activities after the treatment? If yes, for how long?
- How long can the stent graft remain implanted in the body?
- How many stent graft procedures has this facility performed?
Abdominal Aortic Aneurysm: A bulging or “ballooning” of a weakened area of the abdominal aorta (main vessel of the arterial system of the body that extends through the abdomen). This term is often abbreviated to “AAA.”

Aneurysm: A bulging or “ballooning” or a weakened area of a blood vessel.

Aneurysm rupture: A tear in the vessel wall near or at the location of the bulging or “ballooning” of the weakened area of the blood vessel (for example, abdominal aortic aneurysm).

Aorta: The main trunk of the arterial system of the body.

CT scan: A series of computerized X-rays that form a picture of your aneurysm and adjacent blood vessels.

Delivery catheter: A long tube-like device that assists in the placement of the stent graft within the blood vessels.

Endoleak: Blood flow into the aneurysm (bulge or "ballooning" of the weakened area of the blood vessel) after placement of a stent graft.

Endovascular stent grafting: A minimally invasive procedure in which a tubeshaped device is placed inside a diseased vessel without surgically opening the tissue surrounding the diseased vessel.

Excluded/exclusion: Shutting off or removing from the main part.

Fluoroscopy: A real-time X-ray image that is viewed on a monitor.

Intravascular ultrasound: An image created on a monitor through the use of high-frequency sound waves from inside the blood vessel (artery only).

Occlusion: The closure or state of being closed.

Stent graft: A woven polyester tube (graft) supported by a tubular metal web (resilient springs commonly referred to as stents) that is placed inside of a diseased (aneurysmal) vessel without surgically opening the surrounding tissue. After being placed in the artery, the stent graft expands to a pre-established diameter. The stent graft relieves the pressure on the aneurysm by providing a new pathway for blood flow.

Ultrasound imaging: An image created through the use of high-frequency sound waves.

Glossary