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# Endovascular Intervention

This information sheet provides information for:

1. Angiograms – imaging of arteries
2. Venograms – imaging of veins
3. Fistulograms – imaging of arteriovenous fistula's

## What is an angiogram?

An angiogram is a procedure to visualize the flow through your arteries. Whilst Mr Ponosh will organise an ultrasound, CT or MRI scan to assess and diagnose your vascular disease an angiogram may be required for further information or to ultimately treat your arterial disease. In some cases, these techniques can also be used to treat disorders of your veins or your arteriovenous dialysis fistula.

Endovascular or key-hole angiogram treatments are minimally invasive procedures that usually require a day-stay or overnight stay in hospital. They are undertaken with an anaesthetist usually under a local anaesthetic with a light "twilight" sedation.

Endovascular procedures are undertaken through a small needle access through your groin (occasionally wrist or arm for fistula) directly into your arteries or veins. Dye is injected through an access tube (sheath) to show the flow through your arteries and is shown by x-rays taken during the procedure to confirm the narrowing's or other disease that needs to be treated. The procedure takes between 45 – 60 minutes in most cases.

They are low risk, essentially pain free procedures in most cases which utilize state of the art modern technologies for excellent outcomes. The results are almost immediate and have a very rapid return to your normal lifestyle.

## During the Angiogram/Venogram.

You will be positioned on the procedure table and your groin or arm skin will be cleaned to prevent infection. You will be exposed briefly and will then be covered in sterile drapes. Occasionally your face will be covered but a "tent" will be made to make you feel comfortable. The anaesthetist will place a small drip in your hand or arm and start your "twilight" sedation. You will be asked to lay as still as possible however if any concerns or questions arise, the nursing and anaesthetic staff will assist you.

Mr Ponosh will inject a local anaesthetic into the skin at the access site, numbing the area. A fine tube (sheath) is inserted into the vessel, with the help of wires, other small, long tubes called catheters can be maneuverer through the blood vessels and positioned as desired. X-ray pictures are taken whilst dye is injected down the catheter into the blood vessels. The dye may cause a hot flush and the feeling of having to pass urine, both will subside after a few seconds. Multiple injections are necessary to see the full length of the blood vessel and the x-ray machine, or the table will be moved in-between them. Mr Ponosh will identify the diseased arteries and treat your disease using either:

**Angioplasty:** Some narrowed arteries (and rarely veins) are treated by passing a balloon across the diseased segment and then inflating it. The balloon will dilate the narrowing treating the blockage and improving your symptoms. The balloon is then removed. Mr Ponosh may elect to use a new state of the art "drug coated" angioplasty balloons which coat the treated artery with a special drug. These balloons have been shown to have very good long-term outcomes especially in cases of re-narrowing.

**Stenting:** In some cases, Mr Ponosh may decide a stent is the best option to treat your narrowed arteries (or vein). Stents are either a bare metal scaffold or are plastic covered to help hold the artery open. These are minimally invasive devices which are permanent and often have special drugs coating them to help improve outcomes. They may be used to treat narrowing or in some cases aneurysm's of your arteries.

**Atherectomy:** This is a key-hole device used in conjunction with ballooning or stenting to "drill" or excise out arterial disease. It is used in specific cases to improve outcomes.

**Embolization:** This is a procedure usually used on veins and occasionally arteries in which small metal coils are permanently placed in vessels to block them off. This is often used on "leaky" veins such as an ovarian vein and may be part of varicose vein treatment. This coils are made from platinum and will not cause issues with other x-rays or airport metal detectors.

## After the Angiogram/Venogram.

When the procedure is completed all access sheaths are removed. A special staple or plug device may be used to the small hole in your artery. Pressure will be applied to the groin or arm for up to 15 minutes and a small pressure device (Fem-Stop) may be placed on your groin for an hour or so. You will be moved to the recovery area where nurses will keep a close eye on you. Approximately 3-5 hours of bed rest are necessary to prevent any bleeding from the puncture site. The nursing staff will check the puncture site and foot or arm pulses at regular intervals.

Your usual medications may be adjusted after this procedure however this will be clearly detailed to you. You will either stay overnight or be discharged later in the day if you were planned for a day-case procedure. Mr Ponosh's staff will send out an appointment letter for a post-operative consultation and possibly an ultrasound with our in-house sonographers.

## Possible complications and risks.

An endovascular intervention is a very safe low-risk procedure. Mr Ponosh has decided and discussed with you that although there are risks inherent to every procedure, the benefits to you dramatically outweigh them and the angiogram is the best treatment for you.

**Bleeding:** As the operation is performed on blood vessels a small amount of bleeding can sometimes occur. This is often easily treated with some pressure, but it is common to have some bruising to the area after the procedure. You may develop a small lump which will resolve by itself. Serious bleeding is rare but may require an additional procedure to correct.

**False aneurysm:** Very rarely a lump may occur which is in flow with the artery. This is because of some continued bleeding from the puncture site contained within the soft tissues of your groin. This is called a pseudoaneurysm. This may settle by itself, whilst some may require additional procedure to fix, such as an injection or possibly a stent or open surgery.

**Pain and discomfort:** This is usually minimal during the procedure and after. Occasionally you can get some bruising and discomfort to the groin in the following days, but this in minor. In rare cases bruising can last for several weeks.

**Allergic reactions to dye:** Very rare.

**Damage to blood vessels:** Usually these problems can be dealt with at the time of the procedure, but in rare instances, repair is necessary.

**Equipment failure:** It is theoretically possible for a catheter, wire, or device to break and leave a fragment inside the body. This is extremely rare.

**Failure of technique:** Occasionally it is nor possible to perform the planned procedure, or the procedure does not show the desired result. In very rare circumstances a failed procedure can make the blood flow worse. Catastrophic outcomes are very rare.

**Kidney damage:** The dye used is excreted via the kidneys, which in most patients is completely normal. However, especially in patients with poor kidney function, the dye can lead to deterioration in kidney function. Angiograms are used in patients with kidney disease often and safely, but additional precautions are required such as admission the night prior, additional fluids and modifying your medications. Mr Ponosh will discuss these with you. Patients on dialysis do not need additional precautions and angiograms are completely safe.

**Anaesthetic risks:** These are very low and will be discussed with you by our specialist anaesthetists.

**Interventional follow-up:** All endovascular interventions including stents and angioplasty have a small risk or re-narrowing (stenosis) or blockage (occlusion) with time. Modern techniques and equipment have shown to have excellent long-term outcomes but due to the nature of your initial vascular disease, vascular risk factors and the nature of your intervention, issues can arise with your treatment in the short, mid and long term. This is a universally accepted and appreciated result of endovascular intervention. Whilst in many cases it can not be avoided, taking the medications suggested by Mr Ponosh and optimizing your vascular risk factors (diabetes, blood pressure, cholesterol, smoking) can also reduce the risk. This thus requires long-term ultrasound surveillance of your interventions and ongoing long-term review with Mr Ponosh and his team. In most cases, re-narrowing can be treated with repeat endovascular treatments with good outcomes. In extremely rare cases, complications may require open surgery or lead to catastrophic outcomes.