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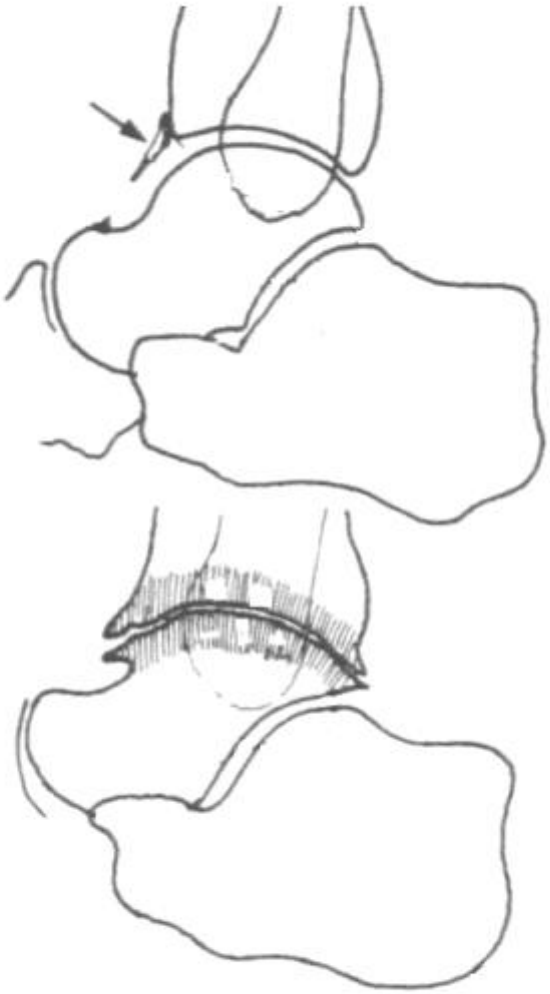
# WHAT IS AN ARTHRODESIS? (FUSION)

An **Arthrodesis or fusion** is an operation performed to 'fix' a joint or joints: your body is 'tricked' into treating the joint(s) as it would a broken bone; the joint surface is removed and screws or other metalwork are passed across the joint to maintain position while bone grows across the gap, "fusing" it solid. It may be used to treat a joint that is affected by severe arthritis or to correct deformity. The aim of this operation is usually to turn *a stiff painful joint* into *a stiff painless joint.*

**Arthritis:** There are many various forms of arthritis, but the two types which are common are **osteo-arthritis** and **rheumatoid-arthritis.**

**Osteoarthritis** is often referred to as 'wear and tear'. It is a painful condition, and maybe accompanied with deformity. Osteoarthritis can occur following acute injury/trauma or years of high impact activities. Sometimes there is no obvious cause. The normal cartilage lining of the joint is slowly destroyed and the surfaces of bone have little or no protection, resulting in inflammation, swelling and pain.

**Rheumatoid-Arthritis** is an inflammatory disease often accompanied with varying degrees of pain and deformity. In those individuals affected by rheumatoid arthritis, the body's immune system is overactive, producing substances that cause inflammation, pain, stiffness and reduced mobility.

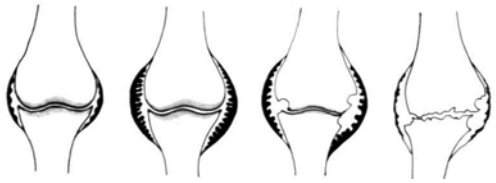


normal joint synovitis &

joint swelling

early joint destruction with periarticular erosions

advanced joint destruction & deformity



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**Radiographic views** (x-rays) of the affected ankle or foot are required so that the severity of the arthritis in your joint can be determined. It is sometimes necessary to carry out further tests and investigations to isolate a specific area

of pain. The surgeon may arrange a **CT scan** (computerised tomography), **MRI scan** (magnetic resonance image) or **guided injections** into one or more joints. Injections are carried out to assess what effect numbing of one specific joint has on your pain. Following this the radiologist will ask you to keep a 'pain diary'. It is **important** that you maintain the diary for the period requested. This gives an idea of the probable effect of a fusion procedure being carried out on this joint.

Just because a joint is damaged does not mean that it will be very painful: some people have very severe arthritis on the radiographs (X-rays) but very little pain and other people have very little changes on the radiograph but a lot of pain. The doctor orders the radiograph to see how much damage has occurred to the joint to help decide on the best treatment but the decision to have surgery is based on your symptoms (pain, limitation of activity, disturbed sleep etc), not the radiograph.

## Conservative (non-surgical) treatment of arthritis

There are many ways of reducing the pain caused by arthritis of the ankle, for example:

painkillers eg paracetamol, anti-inflammatories (discuss with your GP) injections of eg steroids are occasionally helpful in delaying the need for surgery restriction of activity: avoiding long walks or running, for example orthoses (b cushioning, boots that lace up above the ankle walking aids eg crutches or a walking stick there is no evidence glucosamine or chondroitin reduce pain in foot and ankle arthritis but some patients like to try such remedies.

One or more of these methods should be tried before considering surgery because all surgery carries a risk of complications and failure.

## The decision to have surgery

The surgeon will carry out an initial consultation with you in clinic and will perform a clinical assessment of your foot and ankle and ask questions regarding the nature and level of pain that you experience. You will usually be offered an arthrodesis when *most or all non surgical measures have failed to control your pain.*

The decision to have surgery is primarily based on whether you have pain that interferes with sleep or activities that you usually perform during the day: when this pain cannot be controlled by medication or other conservative

measures, it is appropriate to consider surgery.

Patients often have concern as to how the arhrodesis will affect the way they walk. In most cases, the gait will be improved due to the pain relief obtained. Most patients with a successful arthrodesis walk without a limp, are able to cycle, play golf etc. You can ask to attend a group meeting where you will meet a patient who has had an arthrodesis and have the opportunity to ask more questions.

# COMMON TYPES OF HIND FOOT FUSION

## ANKLE FUSION

The ankle (tibiotalar joint) - is the joint between the shin bone (tibia) and the uppermost bone of the foot, the talus. This operation involves fusing the tibia (shin bone) and talus. It has a 90% success rate.

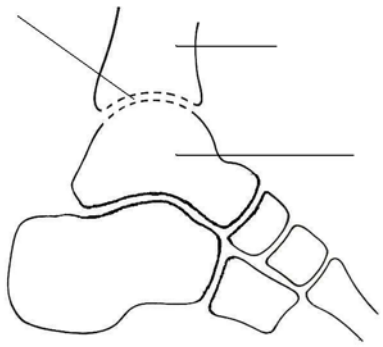
For the ankle, the surgical options include an arthrodesis or an ankle replacement. Arthrodesis is an established procedure which is excellent for pain relief but removes ankle movements completely; however, you will retain as much as 50% of the extension- flexion (up and down) movement of the foot which is achieved because your many foot joints are still mobile. You are likely to do more following the procedure as your pain will be greatly diminished. Your ankle joint will probably already be quite stiff but is likely to be **painful** and stiff. The operation changes your ankle from a **painful** and stiff joint to a **painless** and stiff joint. Ankle replacements are still semi-experimental though growing in popularity; they are not as yet as successful as hip or knee replacements and the long-term results are not known. Ankle replacements are not suitable for younger, more active patients or patients who have significant deformity/instability of the ankle.

The diagram below indicates (dotted line) the joints involved in the procedure.

(Ankle) Tibiotalar joint

Tibia

HOW IS THE OPERATION IS PERFORMED?



Incisions (cuts) are made over the front and on the inside of the ankle. Sometimes patients are suitable for arthroscopic fusions. This is performed through two small incisions. The degenerate surfaces are cleared away and if necessary re-shaped to correct any deformity. The joint is placed into the correct position and 'fixed' using screws. Your ankle will then be protected by a plaster cast.

The operation usually takes one and a half hours and is usually done under a general anaesthesia (asleep). A lower leg block anaesthesia is used to provide pain relief following the procedure. The anaesthetist will discuss the most suitable method of anaesthesia for you.

Talus



# TRIPLE FUSION OR ISOLATED HIND FOOT FUSION

The term 'triple arthrodesis' refers to a surgical procedure that fuses three joints; (illustrated below, see dotted lines). This operation is designed to correct deformity, relieve pain and improve function. These three joints allow side to side movement below the ankle joint. Fusing them will prevent almost all side to side movement. However, it is important to understand, these joints are often already **very stiff** when affected by arthritis or deformity.

The diagram below indicates (dotted line) the joints involved in the procedure. Sometimes the surgeon may advise that these joints are fused in isolation, or a variant combination of fusion may be required to correct deformity etc...

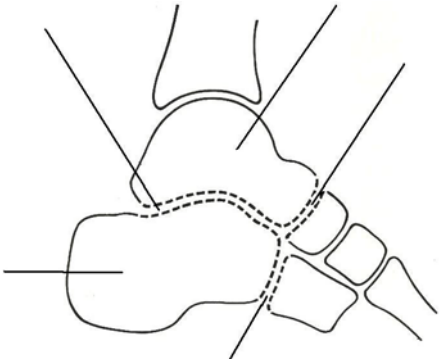
Subtalar joint Talus

Calcaneus

Calcaneo-Cuboid joint

HOW IS THE OPERATION IS PERFORMED?

Talo-navicular joint



Incisions (cuts) are made along the inner and outer side of the foot. The joint(s) are exposed and the degenerate surfaces are cleared away and if necessary re-shaped to correct any deformity. The joint(s) are placed into the correct position and 'fixed' using screws or staples. Occasionally a bone graft is required particularly when a deformity needs to be corrected. The bone needed to carry out this procedure may either be taken from the bone that has already been removed from preparation of the joint surfaces, or sometimes bone may be taken from the pelvis or tibia.

The operation usually takes one and a half hours and is usually done under a general anaesthetic (asleep). A lower leg block anaesthesia is used to provide pain relief following the procedure. Your anaesthetist will discuss and offer advice as regards the most suitable method of anaesthesia for you.



# IM NAIL FUSION

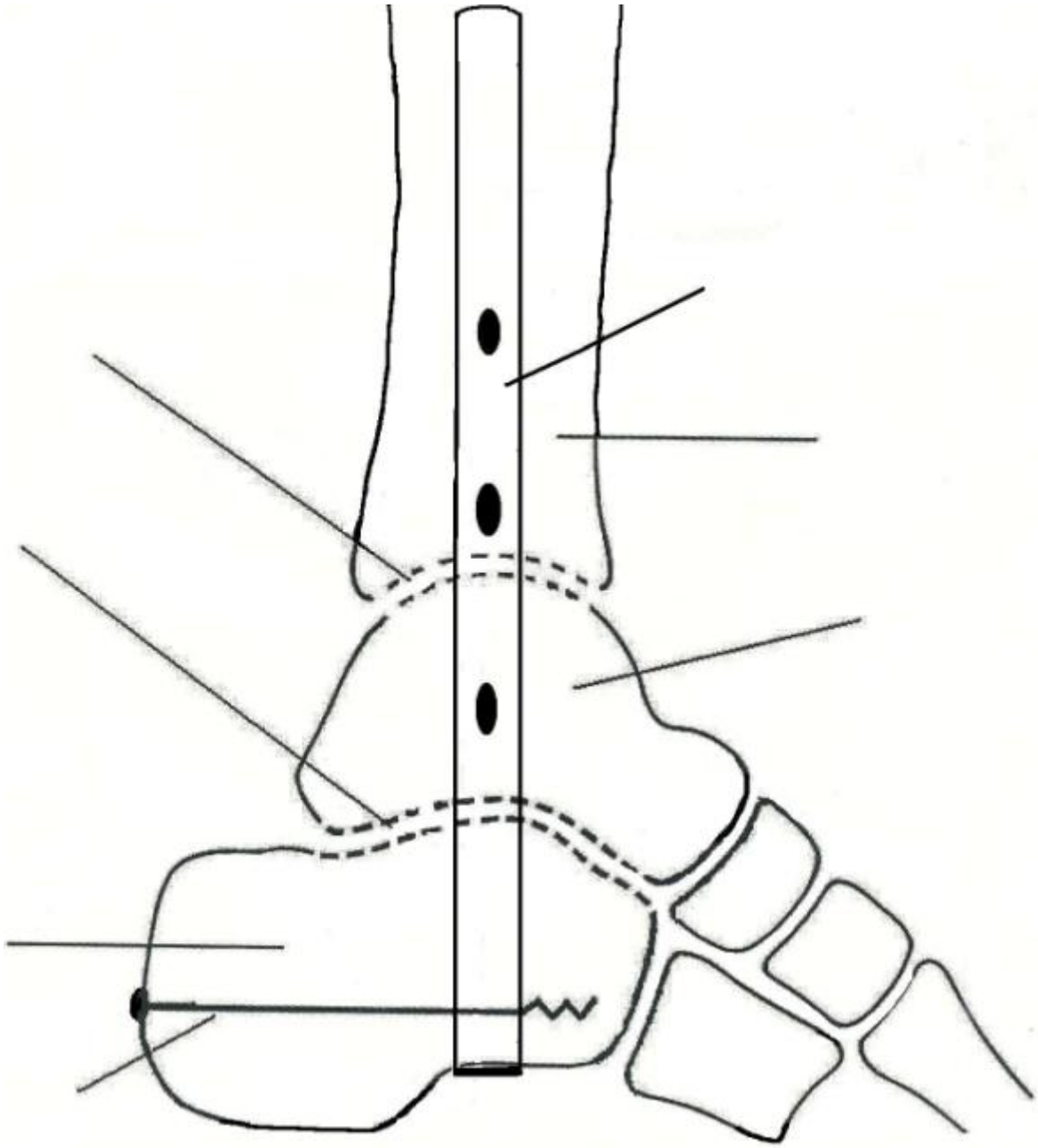
Occasionally, a procedure called a **tibiotalocalcaneal fusion** may be indicated. If you have a tibiotalocalcaneal fusion this fuses the shin bone to the main bones in the back of the foot (talus and calcaneum). If you have a tibiotalalocalcaneal fusion the bones are usually fixed together using a large metal nail inserted into the middle of the shin bone. The nail is inserted through an incision in the bottom of the heel, screws are passed through the nail to prevent it from moving within the bone. The main scar for this surgery will be on the outside of the ankle. Sometimes a bone graft is required particularly when a deformity needs to be corrected. This may either be taken from the bone that has already been removed during preparation of the joint surfaces, or from the pelvis or tibia.

A tibiotalocalcaneal fusion is a major operation that is carried out to treat severe arthritis or major deformity. If you have severe deformity, or associated

medical conditions the risks associated with this operation are higher.

The duration of the operation may vary but usually takes about two hours. Fusion of joints will usually be carried out under a general anaesthetic (asleep). A lower leg block anaesthetic provides pain relief following the procedure. However, each individual is unique and the duration of pain relief may vary accordingly. The anaesthetist will discuss the most suitable method of anaesthetic for you.

The diagram below (dotted line) indicates the joints involved in the procedure.



Tibiotalar joint Subtalar joint

Calcaneus Screw

I M Nail

Tibia Talus

# IMPORTANT POST OPERATIVE ADVICE

**Following your operation** you will remain in hospital between 2 and 4 days. When you arrive back on the ward from theatre your leg will be in a backslab (half plaster cast) from toe to knee.

**Wound site** - you will either have stitches or steri strips in-situ with a dressing covering the wounds. It is extremely important to keep your leg elevated to above groin level for 55 minutes in every hour for the first 2 weeks following the operation. This greatly helps to limit swelling and reduce post operative complications. You will be seen and assessed by a physiotherapist who will instruct you on the safe use of crutches.

**An appointment** to attend the outpatient department two weeks following your procedure will be arranged. If the wounds are sufficiently healed then a complete light weight plaster cast will be applied.

## Your lower leg will usually be placed in a below-kneeplaster cast for approximately 12 weeks following fusion of your joints. As a general rule, your weightbearing will be as follows but your treatment will be individualised.

*For the first 4 weeks following the fusion* **– non weight bearing (this means NO weight is to be put through the operated limb)**

*For the second 4 weeks following the fusion* – **partial weight bearing (this means SOME/MINIMAL weight bearing is acceptable)**

*For the remaining 4 weeks following fusion* – **full weight bearing is permitted**

**A check radiograph** (x-ray) will be taken at 3 months following the fusion. This is done to ensure that union/fusion has occurred. If this is the case then the plaster cast will be removed. Some patients take longer to fuse (especially those who smoke).

**Returning to work –** this depends on the type of employment. If you have an office or sedentary type of employment and there are provisions for you to elevate the affected limb then you may resume work 4 weeks following surgery. However, if your employment is physically demanding and usually involves long periods on your feet then it is advisable to refrain from work for up to 6 months. This decision will entirely depend on where your type of employment falls between these two extremes!

**Driving –** if you have a fusion on the left foot and an automatic car you can usually drive by four weeks after your operation. You **must** be able to perform an emergency stop. **Your insurance company must be notified** regarding the type of operation that you have undergone to ensure that cover is valid.

**Sport –** following the removal of the plaster cast you may start to pursue increasing exercise. Walking on uneven ground will be difficult following a hind foot fusion. The foot will obviously be stiffer than previous. However, due to the fact that you are now pain free you will find that you are more comfortably able to walk a reasonable distance on the flat, slopes, stairs, drive and cycle. You will be unable to move your ankle up and down following an ankle fusion and your calf may become thinner (due to decreased muscle tone). Vigorous sports such as football, squash etc... is unlikely following a hind foot fusion or ankle fusion.



# POSSIBLE COMPLICATIONS OF SURGERY

**Swelling –** You should expect some swelling for up to one year after surgery. Each person heals at differing rates. If swelling persists and you are concerned, seek advice from a member of the foot and ankle team.

**Infection –** This occasionally occurs in a small percentage of patients. However, if this is the case then it is possible that further surgery may be required to remove infected bone or screws/pins. Minor infections are slightly more common and normally settle after a short course of antibiotics.

**Numbness or tingling – This can occur** at the surgical site(s) as a result of minor nerve damage. Most often this is temporary, however, numbness or sensitised area may be permanent. **Incision site –** The outer surface of the foot where the blood supply is not so good may be slow to heal. If this is the case more frequent wound dressings may be required to ensure that the wound does not become infected.

**Position –** Research has shown that 5-10 % of fusions do not heal in the exact position intended. This may be either due to the fact that the position was not achieved at the time of surgery or that the bones have shifted while in plaster. This does not usually cause any major problems. Further surgery may be required to correct this, but this is rare.

**Non union –** Occasionally bones fail to unite (not join). **If you smoke** your risk of non union or major complications are greatly increased. **It is essential**

**that you stop smoking before surgery and refrain from smoking until all bones have healed.** You will be advised against a fusion if you smoke.

**Screws –** Occasionally they may need to be removed if prominent. **Scarring –** Any type of surgery will leave a scar. Occasionally this causes pain and irritation.

**Blood clots –** Deep vein thrombosis (DVT) or Pulmonary Embolus (PE) are rare. Please inform the team if you have had a DVT or PE before or if you have a family history of clotting disorders.

REPORT SEVERE PAIN, MASSIVE SWELLING, EXCESSIVE NUMBNESS OR PINS AND NEEDLES TO YOUR GP OR TO US