



Limb surgery involving an Ilizarov frame

This leaflet provides information and advice on the use of an Ilizarov frame following surgical repair of a bone. Although it refers to Ilizarov frames, much of the information would also be relevant for other external fixator frames, used in both lower limb and upper limb repair surgery.

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Introduction

Your injury will determine where your Ilizarov frame is situated.

Your frame may be in place for several months or even years so you will have to make some changes to your activities of daily living. However, it is important that you get on with your everyday life to help with your recovery.

This leaflet outlines some of the common challenges that you may face, and some recommendations on managing your frame throughout your rehabilitation journey. It is important that you and your family/carers read this information carefully, as it will help prepare you for your operation and the treatment that will follow. You will have to make the necessary changes to your normal day, such as work, home or school life.

When might I need a frame?

Prior to your operation the consultant will discuss with you the details of your planned surgery and what to expect. The most common reasons for needing a frame are:

1. **Complex fractures:** If you have a complex, open fracture or the bone has broken into numerous fragments, a frame could be used to help align the fragments to help with bone healing and to stabilise the limb.
2. **Fracture mal-union:** This is when a fracture has healed in the wrong position or at the wrong angle. When a limb heals at the wrong angle it can cause complications to the joint surrounding that limb. If it has caused one limb to be shorter than the other, it can also create a limp when you are walking. Surgery will straighten the bone and the frame will then hold it in place until it heals.

3. **Fracture non-union:** This is where a previous fracture which may have been held in place with metal work, has not healed properly. This may require surgery for the internal metal work to be removed and an external fixator to be used to support the stable bone afterwards.
4. **Limb lengthening or correction of limb deformity:** An Ilizarov frame can be used to help lengthen one of your limbs. This usually occurs following a mal-union of a fracture which has resulted in one limb becoming shorter than the other. Different limb lengths can cause problems with your walking and potential back problems.
5. **Osteomyelitis:** This is an infection in the bone. It can occur in any bone of the body; however, it most commonly occurs at the site of an old injury or surgery. On rare occasions, it can occur without any history or surgery. Surgery is required to remove the diseased bone and any metal work which may have been used to fix a fracture in that area previously. Some patients who have osteomyelitis may get infection in the soft tissues, which may require further plastic surgery.

What are the risks of this kind of surgery?

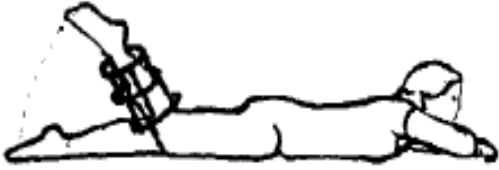
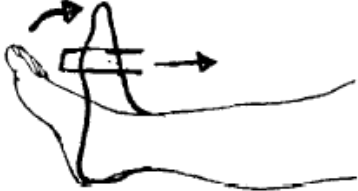

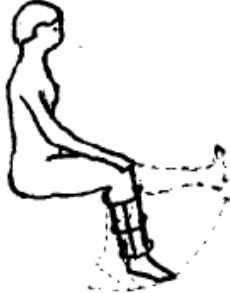
You will have a general anaesthetic (you will be asleep) for the operation to allow the frame to be fitted. The main risks of the surgery to be aware of are:

- **Vomiting and nausea** from the anaesthetic.
- **Blood vessel problems** – After the surgery you may have some bruising or bleeding around the pin sites; this should settle down in a few days. Very rarely, some patients develop a blood clot in their legs which can be life-threatening. This risk can be reduced by performing all the physiotherapy exercises provided in this information. You will also be given 6 weeks of blood-thinning medication – Tinzaparin injections, which the nurses on the ward will show you or a relative how to do.
- **Joint or muscle stiffness** – This can be avoided by regularly exercising the affected limb and joints at either end of your frame, as much as possible. Please follow the exercises in this physiotherapy leaflet.
- **Pin breakage** – Broken pins can be removed or repaired, although sometimes you may need to come into hospital to have this replaced.
- **Constipation** – Can be caused by changes in diet, the amount that you move, the pain relief you will be taking, and the surgery itself. Help prevent constipation by regularly drinking 8-10 cups of water, eating wholemeal bread, biscuits, fruit, nuts and vegetables.
- **Pin site infection** – Most people suffer from an infection to the skin and tissues around a pin at some stage of their treatment. The signs to look out for are: pain around the wire, not being able to walk on the leg, redness, feeling unwell, oozing from the pin site. If you experience any of these, contact the hospital on **0118 322 6938** (Orthopaedic Clinic) or the orthopaedic clinical admin team (CAT 5) on **0118 322 7415**.
- **Nerve damage** – This may present as numbness or difficulty in moving part of the limb, i.e. foot drop. If you experience these symptoms, discuss them at your next outpatient follow-up appointment.

Physiotherapy

Mobility: There is usually a period of bed rest immediately following surgery when your limb will be elevated to minimise the swelling. You should try to mobilise as much as possible after this period of time. Physiotherapists on the ward will help you to mobilise initially. There may be restrictions to how much weight you can bear on the limb, e.g. partial weight-bearing or toe touching with crutches. For you to be able to go home, you must be able to safely use your mobility aids. You will be given some exercises to carry out at home to prevent the limb getting stiff.

Exercises to carry out: The frame can be very heavy to lift and move around so initially, you may find the exercises difficult to do. However, it is important that you complete the following exercises to prevent any stiffness and to reduce the risk of your muscles becoming weak.

<p>1. Lying flat on your front. Bend your knee and bring your heel towards your bottom.</p>	
<p>2. Bring your ankle towards you, then point your toes towards the floor.</p>	
<p>3. Lying on your back, lift your leg up straight as high as you can. Gently lift it back down.</p>	
<p>4. While sat in the chair, lift your leg up in front of you to achieve a straight leg. Hold for approx. 5 seconds, then slowly lower your leg down.</p>	

Recommendations

Smoking: One of the most important things you can do to improve your recovery is to give up smoking. Smoking can lead to delayed bone healing; therefore, you should try to stop smoking as soon as you have had your surgery or even before. Smokers can have more anaesthetic-related complications and a prolonged recovery time compared to those who don't smoke.

Complications caused by smoking include:

- A prolonged recovery.
- Wounds that take longer to heal.
- Wounds that are more likely to get infected.
- Reduced chance of plastic surgery skin grafts healing.
- Increased chance of fractures not healing, resulting in non-union of bones.
- Increased risk of developing a chest infection.
- Increased hospital stay.
- Pain management can become difficult.

Diet: Diet is important as it is vital you have enough vitamin C, vitamin D, protein and calcium in your daily diet to help aid healing. Calcium affects how strong your bones are and their ability to heal. Try to introduce foods such as milk, cheese, eggs and yogurt, which are all rich in calcium.

Vitamin D is important as it controls the amount of calcium absorbed from the intestines. This can be found in milk, cereals, egg yolk and liver. You can also obtain vitamin D by sitting out in the sunlight for 20 minutes.

Vitamin C is predominantly found in fruit and green vegetables. These boost your immune system and speed up wound healing. Proteins are the building blocks of tissues in the body; therefore, a high protein diet can help to heal and enhance recovery.

Drinking alcohol: Heavy drinking can cause brittle bones that break easily, and it also affects the body's ability to absorb calcium. You should not exceed the weekly limit of 14 units a week.

After your surgery

Frame: The frame/external fixators are used to fix the bone from outside of the body unit it heals. 1.8mm wires are used, which go through the bone and are attached to the frame on both sides. There are rods or struts between the rings to make the frame stable. These can be used to make adjustments if the surgeon is correcting your deformity or in some cases to push the bone ends closer together to encourage healing. These will be explained in detail if required. Normally, no adjustments are made.

Pain: The pain caused by your operation will gradually improve as you recover from the surgery. It is important that you manage your pain sufficiently enough for you to be able to move around, to prevent this from hindering your recovery.

Pin site care: The pin sites are the areas where pins or wires pierce through the skin. These are extremely important to keep clean. While in hospital, the nursing staff will complete the pin site care for you. However, once you go home you will need to care for these yourself. The nurses on the ward will teach you and your family how to do this. It is advisable that you take some painkillers an hour before the pin sites are cleaned. This is done once a week and you may shower (but not soak in a bath) and get the frame wet prior to pin site care.

Swelling: After surgery it is normal for the limb to swell and it is very important that you rest and elevate the limb when this happens. The swelling should reduce after elevation. Make sure you



elevate the limb after exercise and every night. If swelling persists after elevation, then please contact your GP.

Skincare: Patients may suffer from itchy or dry skin on the limb with the frame on. Dry skin can accumulate as daily showering and clothes are not rubbing off the dead skin cells like normal. It is important that you clean the limb with a sponge or flannel and dry it with a towel to remove the dead skin cells. You should moisturise the skin; however, this should be kept away from the pin sites as it may lead to infection.

Important things to look out for:

1. Nerve problems.
2. Deep vein thrombosis.
3. Joint / muscle stiffness.
4. Wire or pin breakage.

Please contact the hospital if you experience any of these symptoms/issues.

Most frequently asked questions:

Can I walk with the frame on?

Most people should be up and walking after the operation and we encourage you to mobilise as much as possible. This encourages the bones to heal and will aid with your recovery. Some individuals may need a period of not walking on the affected limb. If this is the case, the surgeon and physiotherapists will advise you on this after the operation. Some patients may be fearful of walking with the frame on; however, it is important that you understand mobilising will encourage the bones to heal.

How long will I have to wear the frame for?

This is the most commonly asked question but the hardest to answer as it is individual for each patient, depending on your injury. You are likely to wear the frame for a minimum of 3 months but some patients will have their frame on for 12-18 months, or occasionally longer. The first stage of treatment is the correction of your broken bones. The second stage of treatment is when the bone needs time to consolidate and strengthen. Your surgeon will be able to give you a rough idea of how long you may need to have the frame. The best ways to help with healing are:

- Mobilising as much as possible once you are able to weight bear with the advice from physiotherapists.
- Stop smoking.
- Ensure you are eating a healthy diet.

Will I be able to return to work with my frame on?

This depends largely on the job that you do. You should discuss this with your surgeon before the operation, as you may be able to return to work with your frame on.

What can I wear over my frame comfortably?

Tracksuits with zips or poppers are ideal to go over the frame. Sometimes, patients find they need a bigger size. Most people prefer to wear shorts or skirts if the weather is warm enough. It

should not be exposed to direct heat, e.g. sitting in front of a heater, as the metal will burn skin and soft tissues.

Common challenges with frames

1. *New pain after a fall or knock to the frame:*

Ilizarov frames are very strong and therefore it is very hard to damage them. However, if you have fallen directly onto the frame it is possible there may have been some movement. You should call the hospital to get an appointment for an early review.

2. *Pain around the pin sites:*

This could be a sign of pin site infection which is usually described as a 'burning' pain. There may be other signs, such as: redness, heat around the pin sites and sometimes you can get pus or thick fluid oozing out. It is very important to get this treated as soon as possible. You should take painkillers to reduce the pain and contact the hospital for someone to review the wound. If the pin sites start to ooze you should clean the affected pin sites daily.

3. *New pain in the limb without a fall or knock to the frame*

If this pain is in your calf and not around the pin sites, it is possible it could be a deep vein thrombosis (DVT). This is a clot in the leg which can occur after surgery. This can become very serious and make you very ill. If your calf is hard or tender to touch, then you should attend your local Emergency Department (A&E) as soon as possible to get it checked.

Useful websites and resources

- www.nhs.uk/smokefree
- <https://www.smokefreelifeberkshire.com/>
- www.nhs.uk/change4life/pages/change-for-life.aspx
- www.drinkaware.co.uk
- <https://www.nhs.uk/live-well/eat-well/>

Useful numbers and contacts

Orthopaedic Clinical Admin Team (CAT 5):	0118 322 7415 email: rbb-tr.cat5@nhs.net
Orthopaedic Clinic:	0118 322 6938
Trauma Orthopaedic Unit:	0118 322 7335 / 7336
Physiotherapy Department:	0118 322 7812

Visit the Trust website at www.royalberkshire.nhs.uk

Please ask if you need this information in another language or format.

RBFT Physiotherapy Department. Reviewed: November 2024. Next review due: November 2026.