



**Advice for Patients
Undergoing Frames Surgery
(Ilizarov Frames and Taylor
Spatial Frames)**

Limb Reconstruction Service

Building healthier lives

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The limb reconstruction team

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Clinical Nurse Specialists Limb Reconstruction (frames)

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Specialist Frames Physiotherapists

Useful contact numbers

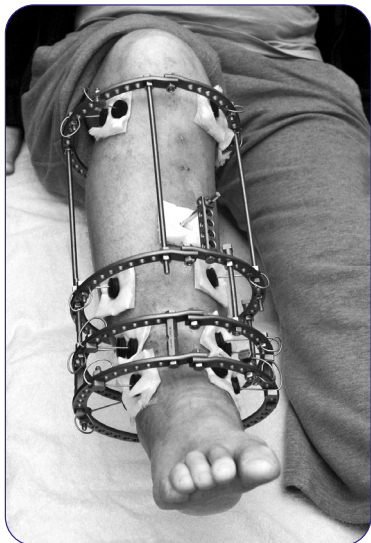
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Getting in touch

The clinical nurse specialist is available during office hours Monday to Friday. In the evening or at weekends the registrar on call for trauma can be contacted via switchboard for urgent advice only. Otherwise out of hours please contact your out of hours GP or attend the emergency department.

Introduction

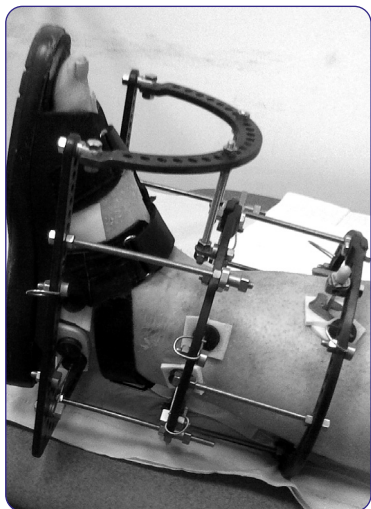
This booklet has been designed to give you and your family or carers information prior to the application of a circular frame or external fixator. The most common external fixators used are pictured below and the limb reconstruction surgeons will discuss with you which one you may need.



Ilizarov Frame



Taylor Spatial Frame

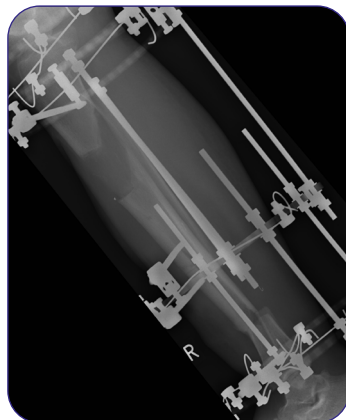


Ankle Frame



Arm Frame

Your frame or external fixator may be in place for many months, and although you will have to make some changes to your daily routine, it is important that your normal life continues. This booklet aims to give you some information regarding the common challenges patients face and some practical solutions. It is essential for you and your carers to read this information so that you are as prepared as possible for your operation and the treatment that follows.



It will also help if you plan ahead so that you can adapt your work, home or school life to fit around life with your frame.

Most of the information that follows refers to circular frame fixators on lower legs but much of the information would be relevant to patients with any type of external fixator on any limb.

When is a frame required?

The consultant and the clinical nurse specialist will discuss the details of your planned surgery and what to expect, when you see them before your surgery. The most common reasons for needing a frame are outlined below:

Fracture non-union: This is where a previous fracture, sometimes held with metalwork, has not healed. During surgery, samples of bone are taken to check for infection which can be one of the reasons bone does not heal. The internal metalwork can also sometimes be removed and an external fixator used to support the unstable bone following surgery.

Fracture mal-union: This is where a fracture has healed, but in the wrong position or at the wrong angle. When a limb heals at the wrong angle this can cause problems to the joints surrounding the limb, or your back as your weight does not get evenly distributed. If it has caused one limb to be shorter than the other it can also create a limp.

Limb lengthening or correction of limb deformity: A frame can be used to help lengthen one of your limbs. This is usually called for following a mal-union (described above) which has caused one limb to become shorter than the other, or due to problems in the growth plates of usually the tibia (shin) bone. Different length limbs can cause problems to the surrounding joints or back problems, which is why frames are used to correct the deformity.

Osteomyelitis: This is infection in the bone. It can happen in any bone of the body but typically occurs at the site of an old injury or surgery. It can sometimes also occur without any history of injury or disease. Osteomyelitis is treated with antibiotics and usually surgery. This is required to remove the diseased bone (debridement) and sometimes the previous metalwork which may have been used to try to fix a fracture. During the surgery antibiotic beads or powder can be placed in the infected area and samples are taken to ensure the correct antibiotics are used. In cases such as this the microbiology team work very closely with the limb reconstruction team. Patients who have osteomyelitis sometimes have infection in the soft tissues as well and in these cases input from the plastic surgery team is often required.

Complex fractures: Sometimes if you have a complex fracture which is open (the bones are out of the skin) or the bone has broken into many fragments, a frame can be used to help line up the fragments to optimise bone healing and stabilise the limb.

The aim of your frame treatment is:

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Plastic surgery

The plastic surgery that is carried out by the limb reconstruction team is not what you read about celebrities having in magazines! The orthopaedic and plastic surgery teams work very closely together in limb reconstruction and often plastic surgery is required to reconstruct soft tissues (skin, muscle, tendons and ligaments) after complex fractures or when there is infection in the soft tissues. If there will be input from the plastic surgery team during your operation, you will also have an opportunity to discuss the plan with them prior to your operation.

Sometimes when the orthopaedic and plastic surgery teams are discussing your plan together it can feel like a frustrating wait. The plan may also change as further information about your injury is discovered from scans or as swelling goes down. The specialist consultants from both orthopaedic and plastic surgery will discuss the most appropriate options for your individual case with you and this may involve a wait, for swelling to subside, for scans, or for the right theatre space and operating surgeon to become available. If you need further updates on your care at any time please contact the nurses looking after you or ask the clinical nurse specialist.

Before your surgery

Pre-assessment screening

You may be asked to come to the pre-assessment screening clinic before your surgery and you will discuss the plan with the clinical nurse specialist and the orthopaedic surgeon. This is also so that blood tests can be carried out, swabs taken and for a detailed medical history to be obtained. This is important so that any potential anaesthetic problems can be identified before you have your surgery.

Please bring any medications you are taking to this appointment and if you are taking any non-steroidal anti-inflammatory tablets (such as Naproxen, Diclofenac or Ibuprofen), hormonal treatments like the

contraceptive pill or Hormone Replacement Therapy (HRT) or blood thinning drugs (such as aspirin, warfarin or dabigatran) you may be asked to stop them. If you are taking antibiotics you may also be asked to stop taking these up to three weeks before your surgery. This is to ensure that any samples taken during your operation to test for bone infection have not been affected by your antibiotics. If you have any queries about the medication you are taking, please ask a member of the team before stopping them.

The pre-assessment screening appointment is an ideal time for you to ask the team any questions you may have. You can write any further questions you may have at the back of this booklet so you don't forget. It can also be helpful to discuss the frame before the appointment with members of your family or carers who will be looking after you as they may have concerns or questions too. You can contact the clinical nurse specialist on the mobile phone with any other queries.

Smoking

If you are due to have an operation, one of the most important things you can do to improve your recovery is to give up smoking. Smoking can slow the bone healing process down so you should try to stop smoking as soon as you know you need surgery and your GP or the hospital can offer support to help you do this.

Smokers have more anaesthetic-related complications and a longer recovery time than those who don't smoke throughout their treatment. Complications include:

- A longer recovery
- Have wounds that take longer to heal and are more likely to get infected
- Have a reduced chance of plastic surgery skin grafts and flaps healing
- Have an increased chance of fractures to bones not healing (non-union)
- Are more likely to get a chest infection after surgery,
- Remain in hospital longer
- Need more pain relief

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 and if you drink as much as 14 units per week you should spread your drinking over three days or more. It is also a good idea to have at least two or three alcohol free nights per week.

Diet

Diet is important both before and after surgery and it is vital you have sufficient calcium, vitamin D, vitamin C and protein in your daily diet. Calcium affects how strong your bones are and how well they can heal. Foods rich in calcium are milk, cheese, eggs and yoghurt. Vitamin D is also important as it controls how much calcium is absorbed from the intestines. Vitamin D is found in fortified products such as milk and cereals, saltwater fish, egg yolk and liver. Vitamin D can also be obtained from approximately 20 minutes of sunlight in the summer months.

Vitamin C (found in fruit, fruit juices and green vegetables) can boost your immune system and may speed up wound healing. It has also been shown to help with bone and cartilage formation and prevent some people getting long term pain problems.

Protein (found in meat, fish, cheese, tofu, egg whites, beans – soy, kidney etc, nuts and seeds) also plays an important role in healing of both bone and soft tissues. Proteins are the building blocks of tissues in the body so a high protein diet can help tissues to heal and enhance your recovery.

It is also sensible to limit the amount of fizzy drinks you consume. Phosphoric acid, which is used in many soft drinks (primarily cola) has been linked to lower bone density. Also, caffeine which is found in many fizzy drinks, increases the amount of calcium that is excreted in the urine. Swapping some fizzy drinks for milk or water based drinks is a good idea.

If you have concerns your intake of either calcium or vitamin D may not be sufficient, then supplements are recommended and you can discuss this with the surgical team.

The operation



You will receive a general anaesthetic for the operation to apply your frame so that you will be asleep for the duration of the procedure. The orthopaedic surgeon will explain the risks and benefits of your individual procedure but the main risks you should be aware of are listed here:

- **Anaesthetic problems** – nausea and vomiting are the most common complaints
- **Infection** – the area of skin the pins penetrate, the pin site, may become infected. This can easily be treated with a course of antibiotic tablets. Rarely a severe infection may require you to be admitted to hospital to receive antibiotics intravenously

- **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 wearing the white surgical, or anti-embolism, stockings after the operation as well as performing all the exercises you will be shown in hospital
- **Joint or muscle stiffness** – this can be avoided by regularly exercising the affected limb and joints at either end of your frame (your knee and ankle or wrist and shoulder) as much as possible. Again, the physiotherapist will teach you exercises to keep as supple as possible
- **Pin breakage** – broken pins can be removed or repaired although sometimes you may need to come into hospital to have the wire or pin replaced
- **Constipation** – changes in diet and the amount you move about, the painkillers you will be taking and the surgery itself can all cause constipation. Ways to help prevent constipation are eating wholemeal bread and biscuits, fruit, nuts, salad and vegetables. You should also aim to drink 8–10 cups or glasses of fluid per day. If you suffer from constipation after your surgery medication can be prescribed to help relieve it
- **Pin site infection** – unfortunately most people suffer from an infection to the skin and tissues around a pin at some stage of their treatment. This is called a pin site infection. Signs to look out for are pain around the wire that means you can't walk on the leg, redness, feeling unwell or increased oozing from the pin. If you are concerned you have a pin site infection you should contact the clinical nurse specialist or your GP and you are likely to need a course of antibiotic tablets

After your surgery

What will the frame be like?

External fixators are used to fix the bone from the outside of the body until it heals, usually using pins screwed into the bone. The Ilizarov and Taylor Spatial frames are circular external fixators that surround the limb. The frame consists of rings (usually 2–6), made of stainless steel or carbon fibre. Thin wires and thicker pins (called half pins), are fixed to the rings of the frame and pass through the skin and into the bone. Half pins are attached on one side of the frame and wires go through the bone to the other side of the frame where they are attached and held under tension. There are also rods or struts between the rings to make the frame stable and these can be used to make any adjustments that might be required.

Pain

The pain caused by your operation will gradually improve as you recover from the surgery. Whilst you are still anaesthetised (asleep during your operation), nerve blocks can be put into the limb being operated on which make it numb for a while. This helps with the pain and can sometimes make the area feel tingly or numb in areas as it wears off.

Pin site care

Pin sites are the areas where pins or wires come through the skin and it is very important to keep these clean. Initially the nursing staff will carry out pin site care for you in hospital. Once you go home you will need to try and care for the pin sites yourself however, so the ward team and the clinical nurse specialist will help to teach you and your family how to do this. Even if you are unable to carry out your own pin site care at



home being aware of the process is important in order for you to advise the people who care for you. Whilst you get used to having pin site care carried out it is advisable to take some pain killers about an hour before the pin sites are cleaned.

You will be given a separate Pin Site Care card to take home with you.

Swelling

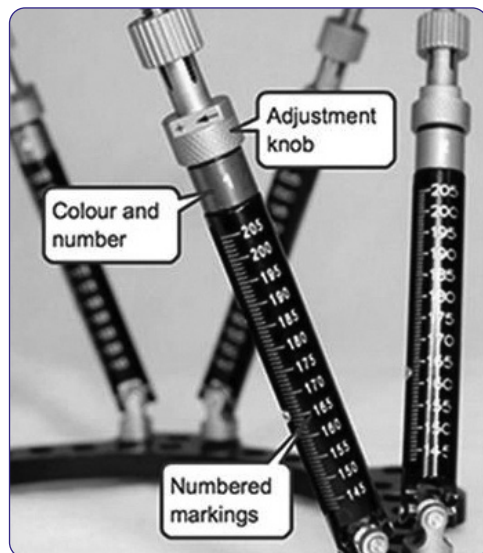
It is normal for the limb to swell up now and again and it is important to be able to rest and elevate the limb (high up) when this happens. Swelling can happen throughout the frame treatment but should go down after elevation. Make sure you elevate the limb in the frame after exercise and every night and if there is any swelling that doesn't go down after elevation you should contact a member of the team who can make sure you aren't doing too much.

Skincare

Many patients suffer from itchy or dry skin on the limb with the frame on. Dry skin can build up as clothes and daily showering are not rubbing off the dead skin cells as they usually would. Cleaning the limb with a sponge or flannel when you shower and drying it with a towel will help remove the dead skin cells but a moisturising cream is usually needed. Any moisturising cream can be used and should be applied to the skin regularly. The cream should be kept away from the pin sites themselves as cream in the pin sites can lead to pin site infections. Keeping your skin supple can also help it to stretch if you are doing corrections and the clinical nurse specialist may be able to suggest a cream you can trial at home.

Adjusting the frame

If your frame is being used to lengthen your limb or correct a deformity then a corticotomy is carried out during surgery. This is a fresh break in a bone, either using your old fracture site and “freshening-up” the ends of the bones during surgery, or by making a new and separate break in the bone. Once this break is made the bone will try to heal using new bone cells. When a frame is applied in order to lengthen a limb or correct a deformity, the frame, that supports both ends of the broken bone, can be adjusted very slowly every day to slowly increase the space between the bone ends in order to grow new bone in the desired position and make the necessary corrections. Modifications can be made to the length, shape or rotation of the limb. The consultant or the clinical nurse specialist will teach you (and your family or carers if necessary) how to adjust the frame after your operation. This is done by turning special nuts that look like dice, with a pair of spanners by one quarter turn up to four times a day. One quarter turn lengthens the frame (called distraction) one quarter of a millimetre in order to create 1mm of new bone per day. Diagonal struts can also be used in the frame and these are adjusted once per day.



Mobility

There is usually a period of bed rest immediately following surgery when your limb will be elevated to minimise swelling. Patients with a frame should try to mobilise as much as possible after this short period however, and you will be helped to do this in hospital by the physiotherapists. There may be some limitations to how much weight you can bear on the limb initially, for example partial weight bearing or toe touching with crutches. You will not be allowed to go home until you can safely use your mobility aids, usually crutches or a zimmer frame, and you may also be given some exercises to carry out at home to prevent your limb getting stiff.



Occupational therapy

During your stay in hospital you will meet members of the Occupational Therapy (OT) team. They will help you to regain as many of your usual daily activities as physically possible. There are devices that can also help to make life easier such as long shoe horns and long-handled 'helping hands' to pick things up if bending down is difficult. You may find it harder to stand for long periods once your frame is on so a high stool in the kitchen and bathroom may help. These devices can all be discussed with the occupational therapists on the ward before you are discharged, it is possible some can be supplied for you but others will need to be purchased yourself.

Follow-up frames clinic

There is a weekly outpatients follow-up clinic for frames patients in the fracture clinic every Thursday afternoon with Miss Bose and Miss Wright or every Friday afternoon with Mr Fenton. This is in the outpatients department on Level 0 of the Queen Elizabeth Hospital Birmingham. You will be seen in the frames clinic two weeks after your discharge from hospital and every 2–6 weeks after that throughout your treatment. If at any time you think you need to be seen sooner than your next appointment you can contact the clinical nurse specialist for advice.

Physiotherapy

After the application of your frame it is important that you exercise to encourage new bone formation and to maintain muscle strength and length. The frames exercise class gives you an opportunity to exercise for approximately an hour each week with other people with similar frames. The class consists of a circuit of exercises for general fitness and weight-bearing along with some exercises specific to your requirements. There will be some time within each session for individual assessment and treatment with the physiotherapist.



The clinical nurse specialist for limb reconstruction also has an ad hoc clinic at most sessions to answer any queries you may have regarding your frame, wound, pin sites or other problems.

The classes are held on Thursday mornings in Therapy Services North Suite at Queen Elizabeth Hospital Birmingham. Male and female changing and shower facilities are available. You will need suitable clothing and footwear, for example trainers, and you may also wish to bring a towel for your own personal use. The class takes place at 11:30 with some patients in the gym and some taking part from home online. You may want to take your pain killers prior to physiotherapy. On your first session you may be asked to attend at 10:30 for an individual assessment before the main class begins and as your mobility improves, you may be asked to attend fortnightly instead of weekly.

If you are unable to attend the class, you should notify us as soon as possible as continued failure to attend could result in discharge from the class. Please contact the physiotherapy department on 0121 371 3466.

Removal of the frame

Once the consultants are happy with how much the bone has healed the frame is usually loosened around the fracture or some struts removed. This gives the Limb Reconstruction Team a chance to 'test' how strong the bone is for a few weeks. Also as more weight is put through the bone it can strengthen the new bone and encourage the last stages of healing. Patients can elect to have the frame removed under general anaesthetic in the day surgery unit but this usually involves waiting at least another six weeks with the frame on for an operation slot so the frame or external fixator is usually removed in the Limb Reconstruction Clinic.

When the frame is removed in the clinic, patients are given gas and air (entonox or laughing gas) and advised to take their own pain killers prior to the procedure. Local anaesthetic can also be injected around

the bigger pins or wires to help with pain. The pin sites and wires are all cleaned, the frame is loosened and the wires detached from the frame rings before being cut and gently pulled out of the leg. Many people do not feel the smooth wires being removed although the thicker half pins or wires with a small metal 'olives' on them are sometimes uncomfortable to remove for a short time. Most people tolerate the procedure very well but everyone is different and some people feel less pain than others. You can usually trial a wire or pin being removed in clinic and decide if you want to proceed in the clinic or not.

Dressings are applied to the old pin sites which usually dry and heal within a few days. Sometimes a cast, brace or splint is required once the fixator has been removed and your consultant will discuss this with you on an individual basis.

Commonly asked questions

How long will I have to wear the frame for?

This is the most commonly asked question but the hardest to answer! The length of time you will need to wear your frame varies between patients and depends on many factors. You are likely to wear the frame for a minimum of three months but most patients will have their frame on for 6–12 months or sometimes longer. Often the first stage of treatment in the frame is the lengthening of the bone or the correction of your deformity. There is a second stage which usually takes longer and this is when the bone needs time to consolidate and strengthen. Your surgeon can give you a very rough idea of how long you may need to have the frame but this largely depends on how well the bones heal. You can optimise bone healing by:

- Mobilising as much as possible once the surgeon is happy for you to weight bear and with the advice of the physiotherapists
- Stopping smoking if you smoke
- Ensuring you have a healthy diet

Can I walk with the frame on?

Most people should get up and about after the operation and try to walk around as much as possible. This encourages the bones to heal. Some patients may need a period of not walking on the affected limb however the surgeon and physiotherapists will discuss this with you after the operation.

Can I have a bath or shower with the frame on?

Long baths are NOT advised due to the risk of pin sites or wounds becoming infected. You are encouraged to shower daily, but to keep the frame clean and dry during the shower other than at your weekly dressing change. Your pin sites should be kept clean, following the advice on the pin site care card.

Can I still sleep with my partner with the frame on?

You may both need to find different positions in bed so that you are comfortable when you sleep and it may help to find a cover for the frame (such as a pillowcase) to protect both the bedclothes and your partner from protruding pins if you want to have sex. We hope treatment will not interrupt your normal relationship with your partner.

Can I go swimming with my frame on?

You should check with your surgeon or the clinical nurse specialist first but once the skin around your pin sites has healed, swimming in chlorinated pools and clean sea water is allowed. It is also good exercise for the affected limb. You may have to check that pool staff are happy for you to attend first and try to plan your trip when your dressing are due for removal so that you can take them off whilst you swim.

Can I drive with the frame on?

You may be able to drive with your frame on if it doesn't interfere with your treatment and if there is sufficient space in the foot well of your car. You can travel as a front-seat passenger if there is enough leg room, or in the back seat with your leg up across the seats. If your surgeon is happy for you to drive, you must consult both the DVLA and your insurance to ensure you are covered.



Can I go back to work with my frame on?

Perhaps – this depends largely on the job that you do. You should discuss this with your surgeon or the clinical nurse specialist before the operation and if you might be able to return to work with your frame on, talking to your employer before the operation will also help as any health and safety issues can be anticipated. Your local Disability Employment Advisor (DEA) can advise you on adaptations to your workplace and/or working in a different job for the duration of your treatment. They can also advise you on retraining if you are unemployed or unable to return to your previous job. Your nearest DEA can be contacted through your local job centre.

Can I go on holiday with my frame on?

This depends on your planned destination and you would need to speak to a member of the team first, particularly if you are travelling by air and make sure you have adequate travel insurance from a company that is aware you have a frame on.

It is important to remember that the metal wires and pins conduct temperature. This means if you are sunbathing you should try to cover your frame with a light coloured cover (a pillowcase gathered at each end is ideal for this) to prevent the frame heating up and burning your skin. This also applies in the cold weather when you should keep your frame covered to prevent the pins and wires becoming cold which can

be very uncomfortable (leg warmers in a large size can be used over the frame to keep your limb warm).

How do I find clothes to fit around my frame?

Track suit bottoms or drawstring wide leg trousers in a larger size usually cover the frame adequately. Some tracksuit bottom styles have poppers up the length of the leg which is ideal for frame wearers. Long skirts and shorts are also useful and leg warmers can keep the frame warm in cold weather. Light cotton covers can be made for hot weather by sewing some material in a tube shape with elastic at either end of the frame to keep it in place.

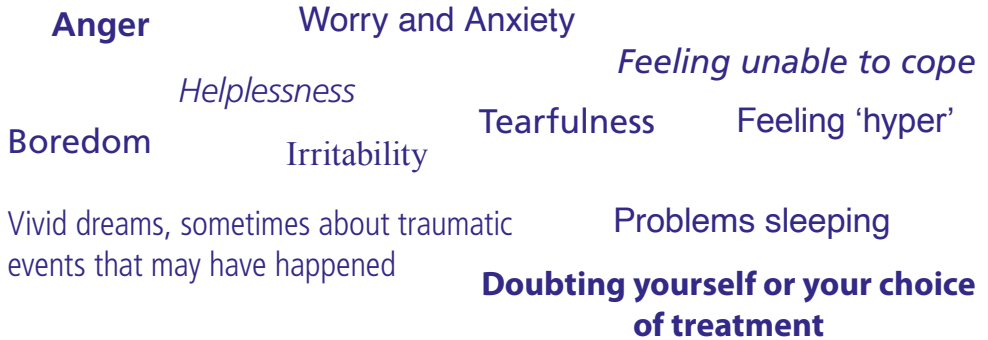


There are also a number of ways clothing can be adapted to fit a frame by sewing extra pieces of material to make wider legs or sleeves. Underwear usually needs to be a bigger size or to be cut down one seam and Velcro used to secure the hem.

The emotional aspects of having a frame

It is normal to feel 'up and down' in the period of time after the frame is applied. You should expect to have good and bad days as well as periods of frustration or impatience with what can be a long treatment. It is important to find ways to cope with these difficult times, through family support, friends, talking to other frame wearers (you may be able to chat to them at the weekly physiotherapy class or clinic), the clinical nurse specialist, consultant or your GP.

The feelings that people sometimes describe are:



Please do not worry that you will experience all of these things! Nobody can predict how you will feel, or what challenges you may come across during your treatment. It is also worth remembering that many of our patients, some who have a frame for many months, progress through their treatment with no problems at all. You may feel entirely different but remember that a reaction to a traumatic event or simply to having a frame is normal. If you have any problems, make sure you can let someone on the team know what is troubling you as it may be easily rectified or there may be ways to adapt to, or overcome, the challenge.

Your family and friends may also experience some of these emotions whilst they try to adjust to what is happening to you so try to discuss any problems together and share this information with them. Attitude is incredibly important during frames treatment and a positive outlook and a sense of humour are imperative! Whilst having family and friends around who can support you is invaluable, looking after yourself, giving yourself time, and being able to motivate yourself through the treatment process is also vital.

Throughout this whole process the limb reconstruction team is here to help you so please don't hesitate to call to ask any questions, gain advice, or just to talk.



Common challenges with frames

1. I have a pain around one of my pin sites

This could be a pin site infection which is usually characterised by an unexplained pain, often described as a burning hot poker pain. Sometimes (but not always) there is redness and heat around the affected pin and sometimes it can ooze pus or thick fluid. The pain from a pin site infection can stop people walking around or make them need to use their crutches again so it is important to get it treated.

What should I do?

Take painkillers and get some antibiotic tablets from your GP or hospital to clear the infection. You should also clean the affected pin site or sites daily and use Allevyn Ag until it has cleared up. Call the clinical nurse specialist for advice just to make sure you don't need intravenous antibiotics in hospital (this happens very rarely).

2. I have a new pain in my limb after a fall or knock to the frame

If the pain is around one or more pins it could still be a pin site infection (see no. 1 above). Ilizarov frames are very strong so it is very hard to damage them. If you have fallen directly onto the frame or knocked it very hard however, it is possible there may have been some movement.

What should I do?

Call the clinical nurse specialist and try to get an appointment, we may need to do an X-ray to ensure the pins and position are still OK.

3. I have a new pain in my limb and I haven't fallen or knocked it

If the pain is around one or more pins it could be a pin site infection (see no. 1 above). If the pain is in your calf or not around the pins it is possible it could be a deep vein thrombosis or DVT. This is a clot in the leg which can occur after any surgery. If the clot gets bigger in the leg it can break off and bits can go to the lung where it is called a pulmonary embolus or PE. This can be very serious and make you very ill.

What should I do?

Call the clinical nurse specialist to get advice if you aren't sure but if your calf is hard or tender to touch you should attend your nearest Emergency Department to get checked out as soon as possible. You may have a Doppler scan to check for a DVT.

4. One of my wires has broken

This is often nothing to worry about – the remaining wires on the affected ring sometimes provide enough support for the frame and limb and no treatment is required. If the broken wire is causing pain it can sometimes be removed in clinic and your treatment may continue unaffected. If there is a lot of pain however, or the remaining support on the ring is not enough, it is possible you may need to have the wires replaced. This is usually a day case operation.

What should I do?

You should call the clinical nurse specialist for advice. You may be able to wait until your next clinic appointment if you aren't experiencing any pain but if the broken wire is causing any problems you may need to be seen more quickly to have it repaired, removed or replaced.

5. One of my pin sites is oozing a lot

Oozing of watery fluid is common, especially in the early stages of treatment and this is nothing to worry about. If the fluid becomes thick or the pin site becomes painful it is possible there is an infection (see no. 1).

What should I do?

Change the Allevyn dressing more often – as soon as the ooze reaches near the dressing border it needs to be changed. If you need advice call the clinical nurse specialist.

6. I am doing corrections and I am in a lot of pain

The stage of treatment when you are carrying out corrections can be quite uncomfortable so it is important to take regular painkillers every day and ensure you keep your limb elevated at night to help any swelling. You may need more painkillers at this stage than later on in your treatment. If you find that the corrections are very hard to do it could be due to a number of reasons. In the Ilizarov frame occasionally the nut can become 'cross threaded' which means it is not sitting correctly in the grooves of the rod and will be very hard or impossible to turn. The rod may need to be replaced which can be done in clinic. The break in the bone that is carried out in surgery needs to start to heal a little and then can be gradually stretched or straightened. Occasionally in some people the bone can heal too quickly. This is called premature consolidation and makes the corrections very hard to do. Sometimes you may need to return for a short surgery to recut the bone.

What should I do?

Contact the clinical nurse specialist for advice.

7. I am doing corrections and I can't bend/straighten my joint

Muscles and tendons don't stretch as well as bone does and sometimes our corrections are limited by how tight the muscle or joints become. The joints most at risk are the ankle and knee. Sometimes physiotherapy and stretching can help with muscle contractures but sometimes corrections may need to be slowed down or stopped to allow the soft tissues to catch up.

What should I do?

Contact the clinical nurse specialist or physiotherapist as soon as you notice a problem. We may need to slow down or stop your corrections for a short time.

8. I am doing corrections and I have missed one

It is important to keep doing your corrections regularly so that the bone doesn't heal before your corrections have finished. Often you can catch up one or two corrections to get you back on track but if you have missed anymore then you shouldn't do them all at once.

What should I do?

If you miss one, you can catch up by doing an extra one before your next scheduled correction but if you have missed more than one you should call the clinical nurse specialist for advice.

Hints and tips from previous frames patients

"Hot and cold: Most people forget that metal conducts temperature. If you go out into a cold environment remember the pins go into your bone. The transfer of temperature down the pin and into the bone is very uncomfortable. The same goes for heat. Never get your Ilizarov frame near a heat source i.e. gas fire, open fire, radiators. The pins get very hot before you feel it, but when you feel it, you feel it!"

"If in pain... elevation can help."

"Keep your pin sites clean and free from dirt as pin site infections are painful. Clean every pin site, clean pins are happy pins!"

"Ilizarov Pendulum: If you have an Ilizarov frame on the lower leg and you use crutches, remember the weight of the frame acts like a pendulum. When you come to a stop, the frame sometimes pendulums, throwing you off balance."

"Weight bearing helps the bone healing process so try to keep as active as you can."

"Can't get the leg comfy? Wrap it in the quilt or use pillows."

"Try to avoid sitting for a long time with your leg folded because the top pin sites will hurt afterwards."

Useful websites

- www.nhs.uk/smokefree
- www.nhs.uk/change4life/Pages/change-for-life.aspx
- www.drinkaware.co.uk

How to find activities in your local area to keep active

www.nhs.uk/Change4Life/Pages/local-change-for-life-activities.aspx

Access the hospital website at

1. www.uhb.nhs.uk
2. Click on QE Hospital
3. In the green "Browse A to Z" box, click L
4. Scroll down to Limb Reconstruction where you will find patient information videos and leaflets

Or type the following into your browser bar

<https://www.uhb.nhs.uk/limb-reconstruction-videos.htm>

If you require this information in another format, such as a different language, large print, braille or audio version please ask a member of staff or email **patientexperience@uhb.nhs.uk**.

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