A little something to read about the Specialist Mobility Rehabilitation Centre

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Preface

The aim of this book is to answer some of the questions that I have been asked in my role as a hospital consultant in amputee rehabilitation. I hope that it will also provide some useful information to those who use our amputee rehabilitation service at the Specialist Mobility Rehabilitation Centre.

There are many different reasons why people become patients at our Centre, some patients undergo amputations, others are born with congenital limb deficiencies, sometimes injuries are so severe they interfere with function and other patients have severe pain.

You will probably find that only some of the questions are pertinent to you at this point in time, but other answers may become of interest to you in the future.

My hope is that once you have read these answers you will have a better understanding of what we do and why. If you think of questions that I have not answered that you would like adding for yourself and for future users, then please contact me and I will endeavour to provide you with the answer and add it to this document when it is reviewed yearly. My contact details are in the back.

Dr Fergus Keith Jepson

Special thanks to Helen B, James, Trevor, Lynn S, Jayne, Kathy, Lynn K, Phil, Rory, Sue, Marie, Helen L, Peter, Tony and all the staff and patients of the SMRC.

1. What are pre-operative and Primary appointments?

If you are coming to a pre-amputation (otherwise known as pre-operative, i.e. before the amputation surgery) appointment then a surgeon will have been discussing with you the possibility of an amputation. The aim of the pre-amputation appointment is to talk about and try to answer the questions you will have such as:

Am I alone?
Why the operation has been proposed and what does it consist of?
Are there any alternatives to amputation that have not been considered?
What are the possible complications of the operation?
Will I wear an artificial limb?
What do they look like?
What will I look like with an artificial limb on?
Who will look after me during my rehabilitation?

It is very common for people to bring a relative or 2 with them to these appointments and it's great for family members to attend; they will think of questions you might have said to them but have forgotten at the appointment itself.
Sometimes there is not enough time for a pre-amputation appointment and we have to tackle these questions afterwards at the first appointment that I see you; this may be on the ward or, as is more likely, it will be the first time that you come to the Specialist Mobility Rehabilitation Centre (SMRC). If there is time then we can always make a further appointment to discuss other questions and for other members of your family to attend with you.

The first appointment, after the amputation surgery has been carried out, is called the **primary** appointment (even though I may have seen you in the unit for a pre-amputation appointment).
In the primary appointment, which lasts about 1 hour, I will talk through the relevant questions above, but in addition I will take a thorough history and carry out a thorough examination from head to toe. If we do not finish in an hour we will arrange a further appointment that will coincide with another appointment at our Centre to fill in any details that we have not finished. At the end of the appointment there will be a clear plan to explain how we will proceed and you should not leave without fully understanding this plan.

2. Am I alone?

This question can be answered in many ways, but they all start with NO, YOU ARE NOT ALONE!
but a lot of patients tell me that they feel lonely and scared after an amputation; this is a huge thing to happen to you and cannot be underestimated. However there are others who have gone through this and others that are going through this at the same time.
We have about 260 patients a year that are referred to just our unit who have undergone an amputation; that's about 5 patients a week, and that's only our area.
Nationally there are about 50,000 amputees, or people who have congenital limb deficiencies (born with part or all of one or more limbs that did not develop).
Are you going to be left alone, to be given an artificial limb and just told to get on with it 'like the old days'?

Definitely not, if you feel this way you must tell me (the telephone number is on the front cover, and I will arrange to see you as soon as possible), because there is a big team of people to help you through this. Some will be in your local area and some will be in regional Centres. '**9. Who will look after me?**' lists all the people in the team and section 2 will expand into much greater detail on the people in the list that form the team at the Specialist Mobility Rehabilitation Centre.

3. What operation has been proposed and what does it consist of?

The discussion that we have at the pre-amputation appointment will depend on what the suggested operation actually is and why it has been suggested.
We will discuss the different surgical options, how they are carried out and if necessary, I will contact the consultant surgeon to discuss all options. The aim of the discussion will be for clarification; I for one would not wish to second-guess your attending surgeon.
There are many different levels of amputation and there can be several different ways of carrying out an amputation at that level; we can discuss none or all of these at the appointment.

4. Are there any alternatives to operation that have not been considered?

Some of the reasons for amputation are related to pain and the shape of the foot, ankle or knee. In certain cases, we will discuss the different alternatives to the suggested amputation, most often all of

the alternatives such as different medication, orthotic footwear, bracing and supportive garments will have been tried, but occasionally there is reason to try something that a patient has not tried before. I have only seen 1 patient in the last 12 months that did not proceed with the amputation suggested on the grounds of success with an orthotic product, but we will discuss any possible options.

5. What are the possible complications of the operation?

I shall be discussing the very broad aspects of these complications and then shall get into more detail with more specific complications relating to individual amputation levels.

When we consider the complications of surgery, we must always consider the complications in terms of those which can occur immediately after the amputation, early in your rehabilitation and much later on. Some of these complications are preventable and others, unfortunately, are highly unpredictable.

5.1 Infection: this unfortunately occurs in about 1 in 10 patients where the wound will get infected to a variable extent. This may be a very superficial infection just in the skin, or it may be a deeper infection further into the wound. It will be treated by your surgical team with antibiotics; however, in certain circumstances, the infection can occur several days after surgery. The symptoms you will get from infection are pain, swelling, redness, tenderness (which is pain caused by pressure over the area), a discharge and usually it is associated with the wound breaking down to a variable extent. If you

have any of these symptoms, or your District Nurse is worried about them, you should consult your GP and contact either ourselves at the SMRC, or your surgical team. If it is a significantly deep infection, it may require returning back to hospital for more surgery; most often these infections resolve with simple antibiotics and dressing changes. Unfortunately, occasionally this can lead to a deeper infection that affects the underlying cut end of the bone. This can lead to an infection of the bone, or osteomyelitis and can occasionally require a further operation, if it does not respond to antibiotics, to trim the infected bone. This operation is commonly called a stump revision operation. Of course, this operation will make your stump shorter and as such this decision will not be taken lightly.

5.2 Phantom Limb Sensation: Phantom limb sensation, when a patient feels some sort of sensation in the part of the body that has been amputated, as though it is still present; this is not a painful sensation but can be an uncomfortable sensation.

There is no reliable way of predicting what type of sensation a patient might feel, but most patients get this from time to time. Some patients have commented to me in the past about a feeling of warmth or a feeling of coldness in the area that has been amputated, nothing they would describe as pain, but certainly something they would describe as uncomfortable. Other patients describe a tingling sensation that is like a tickling sensation. Some have even described a feeling of water trickling down that part of the body that has been removed. When it comes to phantom limb sensations, these can be managed in the same way that I shall discuss in phantom limb pain in the next section. We would not ordinarily treat benign phantom limb sensations; however, if you, the patient, felt that it was uncomfortable

and you would wish for some treatment, I would suggest letting any member of the team know and we shall discuss further.

5.3 Phantom Limb Pain: Phantom limb pain is similar to phantom limb sensation, but the sensation felt is painful and unpleasant. This is never really associated with any benefit and is thus unlike phantom limb sensation, which some patients suggest is of value in coming to terms with their amputation.

The rule of thumb with phantom limb pain is that the more pain that you were in before the amputation, the more likely you are to get phantom limb pain afterwards.

This is by no means always the case and phantom limb pain is very variable.

4 in 5 amputees have some form of phantom limb pain.

The average pain score is 3.5/10.

It is often said that phantom limb pain does what it wants, to who it wants, when it wants, for how long it wants.

There are many ways of dealing with phantom limb pain. There is no reliable way of saying whether the phantom limb pain will start right from the outset after the amputation and get less with time, whether it will get more with time, or whether there will be none after the operation and it will increase as time goes on, or the patient will never get any. It is highly unpredictable in this manner. When it comes to treating phantom limb pain there are many

methods of treatment, we shall cover a few now in the following points:

5.3.1 Night Sock: This is a special stump sock that has been created and includes a special material called **Umbrellan™** which is incorporated into the sock and is reported to decrease electromagnetic interference. It is claimed by the manufacturer that the sock can decrease phantom limb pain. We have found these socks to be of some benefit to the individual and certainly worth a try, especially when the phantom limb pain tends to be mostly at night time.

5.3.2 Psychological Techniques: These are covered in the area describing the work of the Counselling Psychologist and include hypnosis for phantom limb pain, EMDR for trauma that can arise from an amputation (which can exacerbate phantom limb pain) and the mirror box technique.

5.3.2.1 Hypnosis and Phantom limb pain: Hypnosis is a state where your body is relaxed and your mind is focussed. We experience a natural hypnotic state at different times throughout the day, e.g. when watching a film, reading a book, or any time your mind wanders, perhaps even now! Whilst in this relaxed state a hypnotherapist can treat you for a variety of issues by working with your unconscious mind to assist you.

The first objective is to calm the nerves down, which hypnosis does very well.

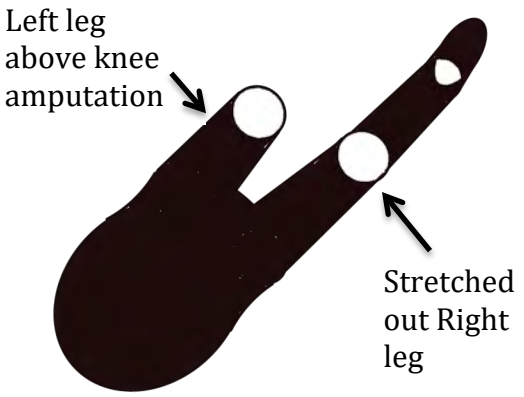
The second objective is to move the phantom limb; by doing this the phantom can get rid of its own pain.

Hypnosis uses the same method we use every day when we have pain: we rub it, move it, warm it and cool it. Under hypnosis the phantom limb is treated as if it is still there, because as far as your brain is concerned, it is.
The course takes the form of only 2 sessions, usually 1 week apart, each lasting for 1 hour. There are no side effects and the average decrease in pain is over 50%.
Some patients are sceptical, but it is well worth trying, as it is as effective as any other form of treatment.

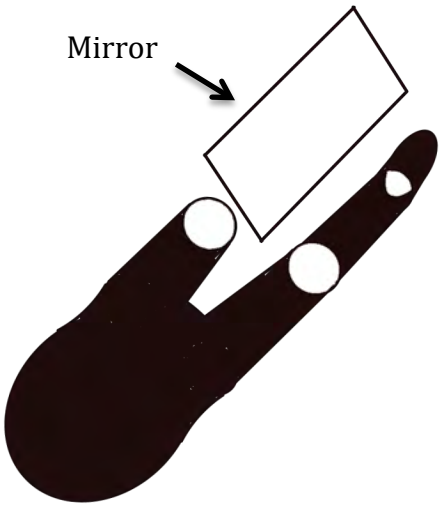
5.3.2.2 Eye movement desensitisation and reprocessing (EMDR) and Trauma: Trauma can take many forms such as life-threatening experiences (e.g. road traffic accident), life events (e.g. operations, amputations), or from several negative events that have increased over time.
One thing that all these traumas have in common is that they make us feel unstable, and this may affect our sleep, eating patterns, judgement and confidence in ourselves.
Some patients will be able to resolve these negative events on their own, more often with the help of friends and family and are able to resume their lives, but others cannot due to the size of the trauma and what it has meant to them. Friends and family and their own coping mechanisms are not always enough.
EMDR is a psychotherapy that works on the root cause of a problem, rather than working on the current problem. Some of these problems are rooted in childhood and the beliefs that we have built up about ourselves. EMDR processes these beliefs by breaking down the threads attaching the negative events, allowing all events to be processed together. The process tends to be highly emotional and as

such EMDR can be challenging to undertake.
If this is a treatment that is offered to you, or you want to know more about it, please speak to me and we shall discuss it further.

5.3.2.3 Mirror box technique: This technique is a way of relieving pain by using the mirror image of your remaining limb to make it look like there has not been an amputation. By concentrating very hard on moving both legs the visual feedback often reduces pain significantly. This is best done with a mirror that is as long as the part of the leg that has been amputated. This is placed between your legs, so when looking at the mirror from the non amputated side it looks as though both legs are there. It is also a good idea to use a towel to cover your leg or wear the artificial limb if you have one at that point, to give the impression of the bulk of the limb. We will talk more about this at your appointments at the SMRC.



This image shows an amputated left leg above the knee. The remaining right leg is stretched out.



The mirror is placed between the legs and angled so that when you look at the reflective side, the

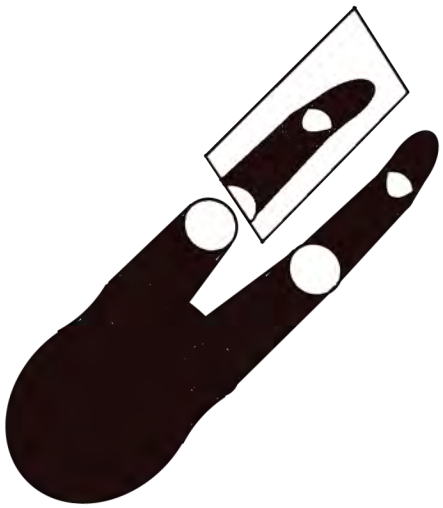
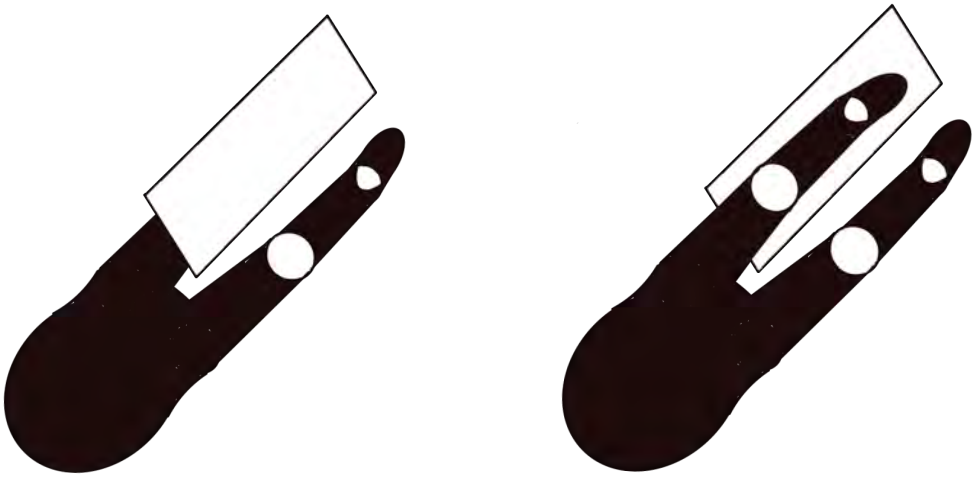


image makes the amputation side look whole. The important part to be able to see is the area where you feel the phantom pain. It is best if you have a mirror that covers the full length of the amputated part.

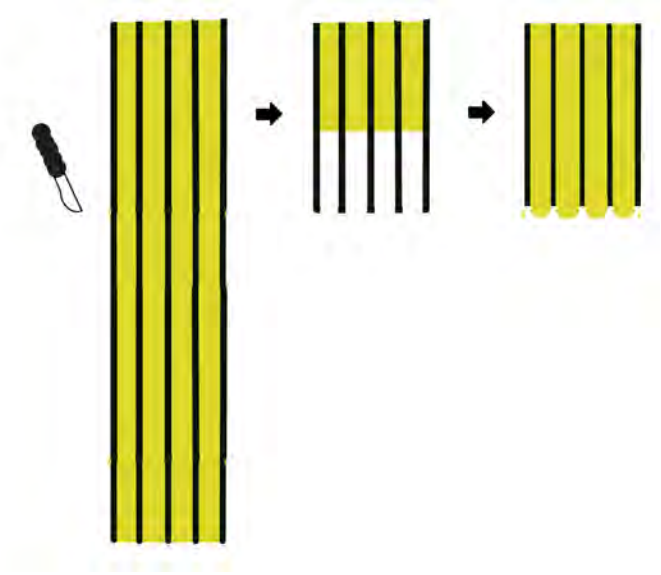


The exercises that you should do are to concentrate in carrying out symmetrical movements of both your toes, feet, ankles and even knees. You have to concentrate to move both your remaining leg and your phantom leg. Remember that all the parts of your brain that send the signals down the spinal cord and through the nerves are all there until the amputation point, so by concentrating you send the impulses down and your eyes see the expected movement. It is tiring and does take some practice sometimes. Try your best to fool yourself and relieve that phantom limb pain!

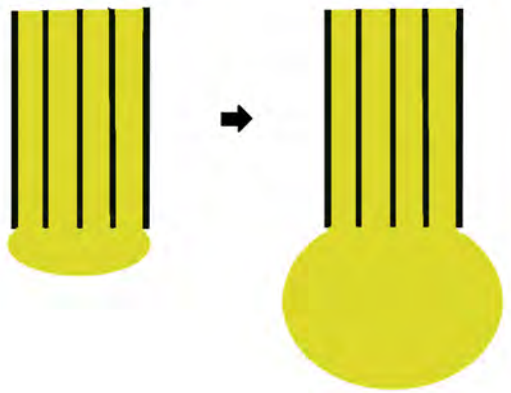
5.3.3 Medication: there are many forms of medication to alleviate phantom limb pain; the commonest ones are Pregabalin, Gabapentin, Amitriptyline and Duloxetine. These medications are specific for dealing with phantom limb pain. Of course, non-specific painkillers are also used such as Paracetamol, Codeine based drugs and non-steroidal anti-inflammatory drugs, although these are generally less effective.

5.3.4 Joint SMRC / Pain management clinic: There are also situations where none of the above work. In these situations, you will be referred to our joint clinic, where we will look at alternative medications and techniques to alleviate the pain. These sometimes include very strong medications and implantable devices, but these are rarely necessary.

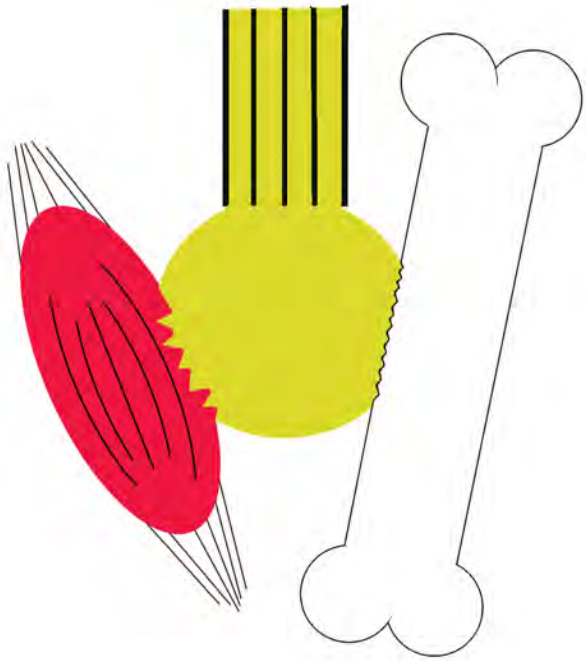
5.4 Neuroma Formation: Neuroma Formation is when the cut end of the nerve, which is still retained within the stump, grows a little portion at the end of the nerve.



Nerves are a little like a lot of electrical cords all bundled together. Just like electrical cords they have a live part, like the wire, surrounded by insulating layers. When nerves are cut or damaged the live part dies back a little, like if the wire was pulled back from the cord. When the nerve starts to regrow, it is a bit like pushing the wire back up the plastic insulation. When the regrowth reaches the cut end of the nerve it sometimes stops growing and other times keeps growing, effectively growing out to try and find the cut end of the nerve that has been disposed of, as a result of the amputation. Sometimes these little lumps that grow at the end of the nerves can grow to quite large sizes. The biggest one that I have seen in my practice has been about 3 cm in diameter. **These lumps are benign and are not cancerous**. Sometimes they act very much like buttons and when they are pressed, they send information up to the brain, which tries to interpret this jumbled up message and unfortunately this can be perceived as phantom limb sensation or more commonly, phantom limb pain. They



sometimes attach themselves to neighbouring structures such as muscle and bone. This can mean that when that muscle is contracted or the bone is moved, such as in walking, it is like the button is being pushed and the jumbled message is sent.



To assess if a neuroma is present, we arrange an ultrasound scan or a magnetic resonance imaging scan. The treatment for these, when they occur, is prosthetic modification, or disconnecting the neuroma from the rest of the nerve by radiofrequency nerve ablation, or surgical excision. By this I mean that we will have a discussion at an appointment; once we have identified this as the cause of the phantom limb pain, we will try to offload the pressure over the neuroma and if that does not work, we will discuss the other options of nerve ablation, or a surgical route.

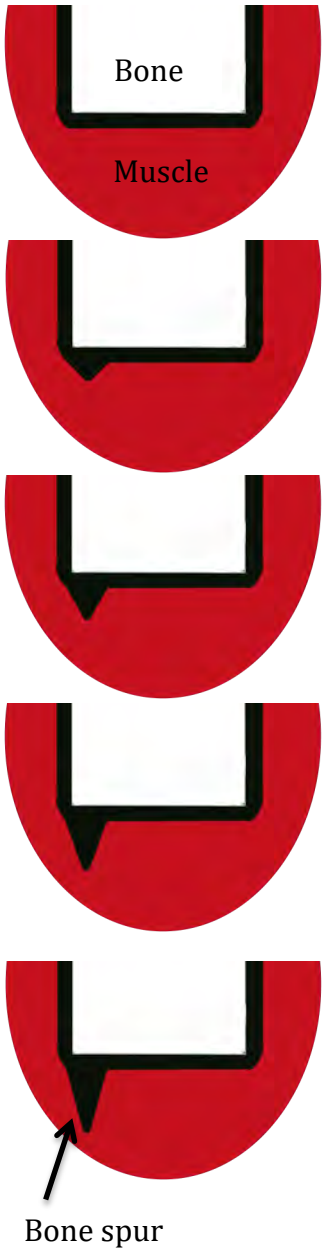
Surgery requires a short inpatient stay for this growth to be removed. Unfortunately, with neuromas there is a high risk of recurrence. About half of them recur; the good news is that of the half that recur, one third of those are better and one third are the same, but a third can even be slightly worse and occasionally a second or third excision is required. Very often we find that by modifying the prosthetic socket we can alleviate the pain. Recently a new technique of targeted muscle re-innervation has come about and it seems to reduce the risk of the neuroma reforming. This will be part of our discussion and if

surgery is required, we will arrange an appointment at our joint SMRC / plastic surgery clinic, for consideration of neuroma excision. We see an average of about 5 patients a month, in the monthly clinic, who are listed for neuroma excision, so this is a very common complication of amputation surgery.

5.5 Stump Pain: Stump pain differs from phantom limb pain, in the way that the pain is felt within the stump itself.

5.5.1 Bone pain: The cut end of the bone can be tender to touch and rarely can be painful in and of its own self. Sometimes this is related to infection as described above, and sometimes it is related to a neuroma that has grown attached to the bone. To investigate this an xray is needed to assess the cut end of the bone and if infection is suspected then a blood test will be needed.
Bone pain usually responds to ensuring the pressure over the end of the bone is relieved within the socket, but occasionally is so severe that it needs revision surgery, although this is rare.

5.5.2 Bone Spur formation: Occasionally there is some extra growth of bone from the cut end of the bone, these are called bone spurs and they can grow and lead to pain when the tissue over the top of the spur is pressed against the spur, or there is movement of the tissue over the spur. To assess for bone spurs an xray is needed.

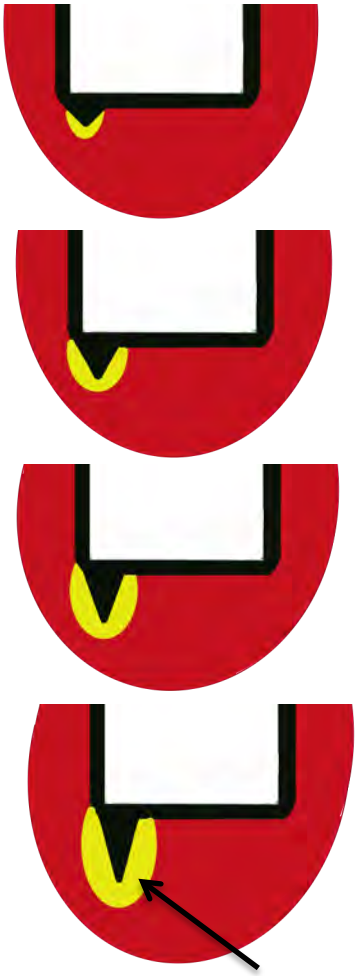


The treatment for this is to offload the area of the bone spur by changing the socket. This can be by expanding the socket or blowing out the socket. Sometimes we need to change the suspension of the limb by taking the pressure away from the end of the stump. If socket alterations and suspension changes do not work, then we will have a discussion about surgical options to remove the bone spur; this would be a stump revision and usually means shortening the bone by a centimetre or 2.

5.5.3 Bursa formation and bursitis:

Sometimes the overlying muscle and soft tissues rub over the cut end of the bone or a bone spur. This can be because the pressure from the socket is too much or sometimes if the tissue is too loose there is too much movement. The tissue gets damaged and small collections of fluid

start to form over the spur, a bit like a blister on the inside. These collect and can get bigger and form a bag of fluid that is the body's natural response, as it allows very little friction from the movement, however if the bag becomes inflamed it can become very painful.



We treat these by altering the socket to respond to what we think is the cause and using topical anti-inflammatories such as ibuprofen gel (if you have no allergies); sometimes anti-inflammatory tablets are needed and we can discuss the suitability of this in clinic.

If a bone spur is considered the cause, or a sharp bone edge, then we will arrange an xray and ultrasound scan and we might need to consider further surgery if the socket alterations or medicines are ineffective.

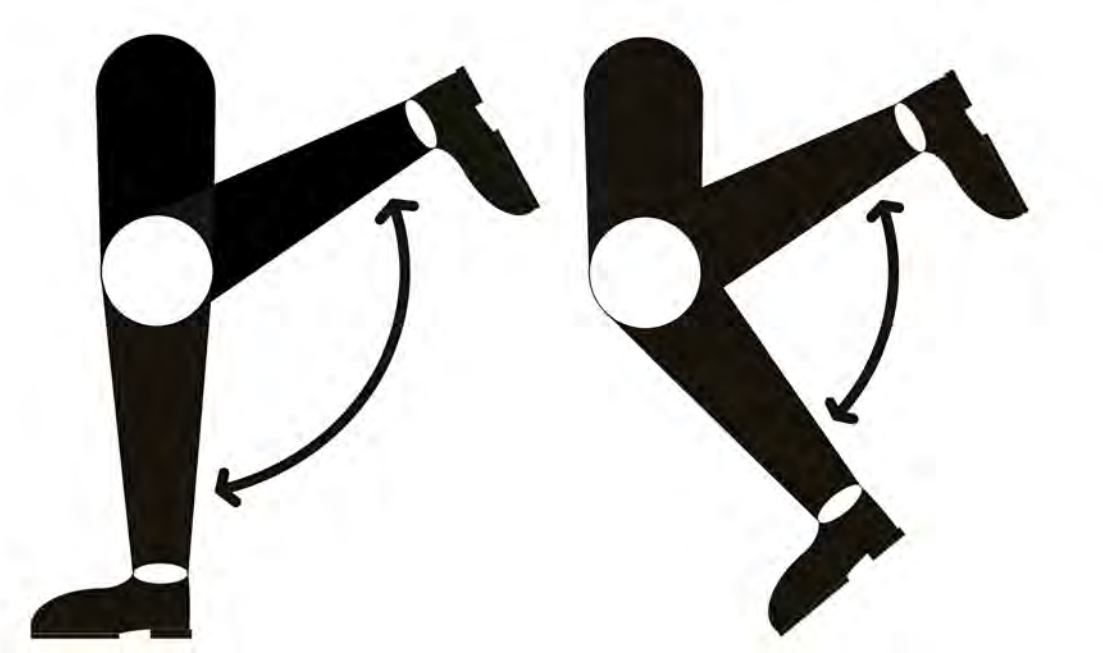
5.5.4 Allodynia: this is where the skin gives a different sensation from a given stimulus. So, a soft touch from a finger or sheet may instead feel painful. Very often the use of a stump-shrinking sock to provide constant compression will alleviate this discomfort. Stump massage can also reduce this symptom, as can some topical medications, like menthol or capsaicin cream.

5.5.5 Hypersensitivity: Here the skin becomes hypersensitive to touch and it is not a painful feeling, but it is an uncomfortable feeling; the treatment is as for allodynia above.

5.5.6 Other causes: Sometimes the pain is felt deeper within the stump and can be related to the very cause that caused the amputation in the first place, for example, - when it is due to a poor blood supply (peripheral vascular disease), or a fracture that has healed incorrectly, this may require further surgical intervention.

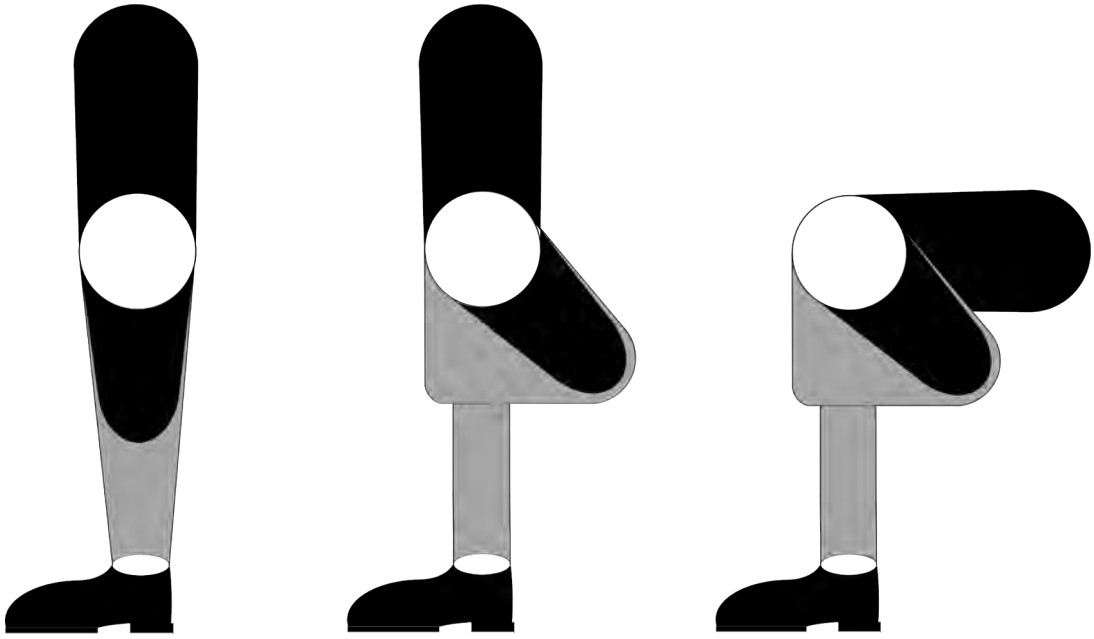
Other forms of managing both Stump Pain and Phantom Limb Pain: Acupuncture / Acupressure – Acupuncture is provided by the pain team.

5.6 Fixed flexion deformity or joint contracture: This mouthful of a phrase refers to when one or more of the remaining joints in the limb that has undergone the surgery, develops a restriction in its ability to move. Unfortunately, this can either be an inability to straighten the joint, or an inability to bend it. Most often the troublesome issue we find is the inability to straighten the joint; most commonly this occurs in the knee and the hip. Regrettably this is preventable in most situations, by carrying out the exercises given by the physiotherapist on the ward. It is very important that these are carried out several times a day, every day. The below image demonstrates the normal range of movement of a knee on the left and reduced ability to straighten the knee on the right.

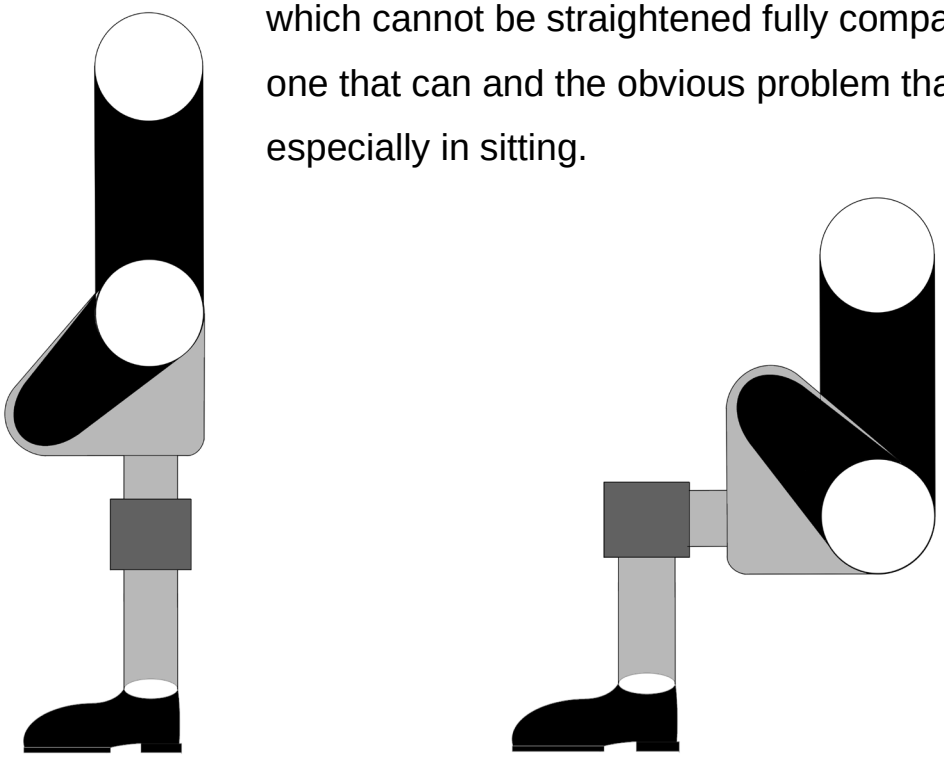


The problem arises, as if the joint cannot be straightened then the prosthetic socket has to be made to accommodate the reduced movement; this can lead to a large socket, which is uncomfortable to stand in and sit in as the images show below. The image on the left is how a stump in an artificial limb should be when the knee joint can straighten fully. The middle image is when there the knee cannot

straighten fully and a socket is made to accommodate this. The right image is then the patient tries to sit down.



The images below show the issues with a hip joint which cannot be straightened fully compared to one that can and the obvious problem that results especially in sitting.



5.7 Stump Dystonia (AKA stump jumping and stump jactitation):
This is uncontrolled and involuntary muscular activity of the muscles within the stump, or the remaining limb. The movements of the stump are beyond the patient's control. These are always described as occasional and although not troubling for most, can be quite distressing to some. They mostly occur at night and can interfere with sleep. The muscles can sometimes go into a cramp that is very painful. There are several ways of treating this: medications that are used for phantom limb pain and the stump socks (shrinking sock and night sock) can be of benefit. Sometimes there will be a need for specific management with some muscle relaxants, such as Baclofen or Diazepam (in the same dose when it is prescribed for back pain due to muscle spasm). If this does not work, or it works but is requiring regular doses, then we will discuss Botox injections into the stump. Botox reduces the ability of the muscle to contract and thus its ability to go into spasm. If this is troubling you, please contact my secretary on the number on the front cover, to discuss this further.

6. Will I wear an artificial limb?

This is a big question and sometimes it is very obvious and other times it requires a lot more discussion and examination.
The rule of thumb:
'**If you were walking before the amputation, then it is likely you will be walking after**'
However, this is only a rule of thumb. There are many factors that need to be assessed at the primary examination.

6.1 General health: Heart and lung problems; walking with an

artificial leg is more tiring than walking with fully functional legs. To give you an idea there is a small table below that gives a rough percentage increase in the amount of oxygen and thus energy, that is required to walk with an artificial leg.

Comparative energy use	
20-59 year old person without any amputations	100%
A patient who has had a below knee amputation for poor blood supply	133%
A patient who has had an above knee amputation for poor blood supply	187%
A patient who has undergone below knee amputations of both legs for poor blood supply	200%
A patient who has undergone amputations for both legs above the knee for traumatic reasons.	220%

As you can see there is a big increase between a below knee amputee and an above knee amputee and between having only 1 leg amputated and 2.

All this means that, if your heart and lungs are not able to carry enough oxygen to your muscles, then you will get tired more quickly. Some patients who have had heart attacks, or have ischaemic heart disease, will not be able to manage walking with an artificial leg, as it will be too tiring. Others who have chest problems, such as bronchitis, will get too out of breath and for both types of patient, walking can be very dangerous to their health.
Another common problem is after a stroke; this can cause it to be so tiring on the unaffected side that the patient does not continue.

6.2 Diabetes: What is diabetes? Diabetes is a condition where the body is unable to properly manage the sugar (glucose) level in

the blood and this level becomes very high. The body makes a hormone called insulin that keeps the sugar at the right level. There are 2 things that can go wrong:

Type 1: The body does not produce enough insulin and is treated by injections of insulin.
Type 2: The body produces insulin but does not respond normally to it. This is managed by diet, tablets and sometimes insulin.

The high level of glucose is monitored by taking a small sample of blood from a pin prick on the finger and this can be done in minutes. Diabetes can lead to many harmful effects in the body:

6.2.1 Effect on blood vessels – Diabetes can increase the 'furring up' of the arteries that normally occurs due to smoking, poor diet and lack of exercise. This occurs in the big blood vessels and is called atherosclerosis.
However, in addition to the big vessel disease the high sugar level can lead to sugar getting deposited on small vessels called capillaries. This is called microvascular disease and is one of the big reasons why diabetics do not heal well and why the feet are particularly at risk of infections and poor blood supply.

6.2.2 Risk of infection – As stated above, diabetes causes a high level of sugar in the blood. This unfortunately means that it is easier for infections to get a hold and develop from small infections into much bigger infections much more quickly.

6.2.3 Effect on nerves – Diabetes causes damage to the nerves. We don't know exactly why this happens, but the effect is that the patient loses the ability to feel touch and other senses in the feet and sometimes the hands also. Doctors often refer to this area of loss of sensation as 'stocking and glove' loss.
This can cause problems for the diabetic patient as they can damage their foot or get an infection without realising it and this can lead to a delay in seeking medical attention. Unfortunately, this can lead to sores and infections that are more difficult to treat when identified.

There are other effects that can occur in the eyes (diabetic retinopathy), kidneys (diabetic nephropathy) and joints (frozen shoulder, Dupuytren's contracture).

6.2.4 What does this mean to you if you have been diagnosed with diabetes?

- If you have any concerns that you may be developing an infection or a sore, or that your artificial limb is not fitting properly then please arrange an appointment to see myself or your GP; if it is very worrying and neither of us are available, please attend your local accident and emergency department.
- If you have had an amputation of 1 foot only then your remaining foot is a very 'precious' foot indeed. At the primary assessment I will examine that foot and leg for effects of diabetes. Quite often you will have been provided with an orthotic shoe to protect your foot; if you have not then we will discuss this.

- Your best defence against diabetes is to do your best to control it and reduce your risk by not smoking, eating well and engaging in some exercise.

If you would like to know more, please ring and we will arrange an appointment with myself and one of the sisters at the SMRC and we can discuss at length with you and provide you with more information.

6.2.5 What is a 'hypo'?

This is short for a hypoglycaemic attack. This means that the level of sugar in the blood is very low, and this can be due to many things, most commonly having not eaten enough for the amount of insulin that has been given but can also be due to illness such as flu, diarrhoea and vomiting.

You may feel light-headed, drowsy, tired and even feel slightly sick. Outwardly the patient may act in a bizarre manner and sometimes can be mistaken for being drunk.

If you feel like this or see anyone acting like this, please let a member of staff know immediately.

6.3 Vascular ulcers: There are 2 types of vascular ulcers. The first and most common is due to venous insufficiency, this is where the veins are unable to return the blood properly and can lead to swelling and thickening of the skin in the foot, ankle and calve. These can be prevented with the use of compression stockings.

The other common type is that due to arterial disease, these are caused by not enough blood getting to the limb and this needs to be

improved to heal the ulcers.
These occasionally are so prominent and prolific that the whole limb has to be rested and can result in the necessity for amputation.

6.4 Trauma: Sometimes a patient has an amputation as a result of a motorcycle accident and the other leg has been injured and repaired but the patient is not yet allowed to put weight through it. On the other side of things there are occasions that the use of an artificial limb is beneficial to helping patients transfer from a wheelchair to another object, this is only for patients with a below knee amputation, foot amputation or partial foot amputation.

6.5 Safety: This is perhaps the most difficult aspect to discuss. A lot of the time it is self-evident but there are times when it is not; the following are the commonest reasons why patients do not walk with the use of an artificial limb from a safety aspect:
Cognitive reasons:
By this I mean that the patient cannot learn to walk safely with an artificial limb, sometimes the patient cannot learn how to put the limb on safely, such as forgetting how the leg is held on and this can lead to the leg falling off when the patient is trying to walk.
Strength and balance:
Sometimes the patient is not strong enough to stand safely with an artificial leg. In this situation the aim is to work on the strength and balance in physiotherapy and reassess if there is any improvement and take it from there.

7. Psychological health

Being an amputee – the emotional journey (written by C Bamford):
Having an amputation is unlike any other surgery. With most types of surgery, you leave the hospital looking the same and in a short space of time you are mobile and able to get on with your life.
Being an amputee affects your appearance and mobility, if you have had part of your leg or foot amputated, and your ability to carry out normal everyday activities such as cooking and dressing if you have had part of an arm or hand amputated. Because of this being an amputee can affect every area of your life and adjustments and changes need to be made. Most people are not happy when they have to make changes in their lives, especially when they don't want those changes.
What have you lost? When you are in hospital or at home you will realise that your independence has been affected and that you have to rely on others such as for meals and bathing. You may feel frustrated sitting there while everything is going on around you, some of which you want to and are used to doing yourself.
You may find friends coming round saying things like "once you get your limb you'll be back to normal". Other friends do not come because they feel uncomfortable and don't know what to say. People don't understand and you say you're "fine" when really, you're frustrated at not being able to do anything for yourself. You're hurt that people you have known for years don't seem to understand and you're frightened for the future.
All new amputees are on an emotional rollercoaster fluctuating between anger/frustration and sadness. The rollercoaster levels out once you get your limb and you begin to make the adjustments to

your lifestyle to allow you to be as active as you are able.

Some patients are not able to use an artificial limb; this could be due to problems with their physical health, their physical condition or safety reasons. If there are these concerns, they will be addressed as much as possible and are discussed with the patient and whomever the patient wishes.

It is an emotional journey being a new amputee as well as a physical one. If you need help along the way, please ask for it. Having someone to talk and listen to you can really help you to see things more clearly and perhaps help you to move forward.

Please discuss this with your consultant who will be able to talk, listen and introduce you to the counselling psychologist, who will be experienced and very helpful.

8. What do they look like?

Below and opposite are pictures of some artificial limbs.

9. What will I look like with an artificial limb on?

There are several factors that make this a difficult question to answer and there certainly is no right answer for everyone.

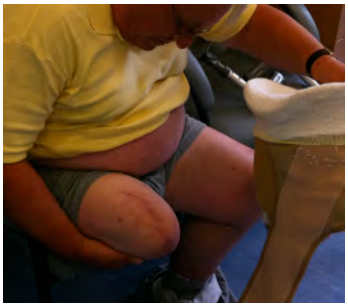
9.1 Personal dress sense: Different styles of clothing will have an impact on the visibility of the artificial limb; long skirts for example will obscure more than short skirts, tight fitting jeans will obviously give more definition of what lies within them than baggy jeans. What I can

say is that we will do what we can to shape the limb to make it as unobtrusive as possible.

9.2 Personal choice: There are a number of patients who like their limb to be without any cosmesis (cosmesis is that which is applied to the limb to make it look a similar shape to the other leg or arm, e.g. foam padding) at all, with the components showing in a very obvious manner. The reasons for this can be anything from liking the look of the naked components to wanting it to be 'out there' for all to see. This is a matter of personal choice and we will do our best to accommodate your choice to the best of our abilities.

9.3 How are they put on (donned)? For example: application of an above knee prosthesis:

1. Sit on the edge of a firm bed or chair, check the skin on the end of the stump.



2. Pull the sock onto the stump ensuring there are no creases.
3. If wearing trousers, put the artificial leg in the trouser leg.

4. Bend the artificial limb (unlocking if necessary).

5. Slide the stump into the socket and place the stump sock over the rim of the socket.

6. Fasten the pelvic band by pulling it round the back then fasten the straps. Then fasten your trousers.

7. If there is a shoulder strap, then pass it over the opposite shoulder.

8. Sit on the edge of the bed or chair with your artificial foot slightly in front. Stand up by pushing from the bed using your hands, stand up straight and lock the knee, if necessary, with appropriate walking aids if necessary.

10. Who will look after me after the operation?

There are many professionals that are available to help you:

10.1 The inpatient team:

Nursing staff look after you before and after your surgery. They will change your dressings and perform your observations as required, talk to you, liaise with your family, make sure you are OK, give you your prescribed medication, liaise with the other health care professionals, to name but a few things they will do for you. In short, on the ward they will look after you with the Health Care Assistants. Health Care Assistants will care for you by helping with the day to day aspects of your care; this may be simply bringing you food and taking it away again to the much more personal tasks of bathing you and managing other aspects of personal hygiene. (Their role is constantly being expanded.)

The medical and surgical team will carry out the preoperative checks, the surgery and regularly review you for any of the complications that I have stated in the preceding pages.

The physiotherapist's role will be covered in the next section in depth.

The occupational therapist's role will be covered in the next section.

The pharmacist will review your medication as prescribed by the medical team.

10.2 The professionals in the community

The district nurses will attend your home for reviews and especially for dressing changes.

The social worker may or may not be involved to help arrange home help if required and other areas of help.

The community occupational therapist will review you at home if necessary; they will have received information from the inpatient occupational therapist regarding any adaptations to your home.

The community physiotherapist will arrange for you to be assessed in the local unit and then arrange a program to improve your balance and walking; please read the full description in the next section.

Your General Practitioner will be sent information from the surgical team and me. He will arrange any medication to be issued and we will contact him if any problems arise or if any investigations or referrals need to be carried out locally.

The team at the SMRC will be described in points 27-33.

11. Why is there a full examination when I am just coming for an artificial limb to be fitted?

The examination is comprehensive because I am assessing if there is anything that might hinder your rehabilitation and if there is, what can we do about it.

There are some common things such as the heart and lung aspects that I have covered previously, or the psychological aspects also mentioned above.

But in the examination, I will also be assessing for any complications of the surgery and any associated problems such as pressure sores, ulcers on foot, circulation, arthritis etc.

At the end of the appointment I will explain the type of prosthetic components that will be used if you are ready for an artificial limb.

At the appointment please feel free to discuss any aspect of the

examination that you would like to know more about.

12. Do you want to meet with an amputee to discuss what it is like being an amputee?

We often arrange for patients who are due to undergo an amputation to have a meeting with a patient who has previously had an amputation. These patients are selected because they have good communication skills and will be sensitive to your needs. They are objective and not coached. If you wish to speak to another patient, please discuss with me. (What you discuss with another patient is not under our control and we do not DBS check these patients.)

13. How do you look after your stump after the amputation scar has healed?

There are lots of ways that you can look after yourself and improve your rehabilitation. Looking after your stump is one of the most important things that you can do and have control of. The exercises that you should do are described in more detail in the physiotherapy section later on and I would recommend that you read that section.
Let's now talk about stump care; this is very important, as the skin over the stump takes a lot of pressure and the healthier it is the more resilient it will be.
First, we will cover care of your stump and then follow on from this with covering the common problems that occur in the stump.

13.1 Stump massage: this is a way of preventing the skin becoming

thickened and adhered (stuck to) to the underlying bone. It is simple process that requires someone (usually the patient but can be a close relative such as a spouse) to put cream on the end of the stump. •The type of cream used depends on personal preference, at the SMRC you will be provided with E45 cream or Diprobase.

•Put cream on the palm of your hands, you then place your hands on the end of the stump.

•The fingers should be placed either side of the stump as demonstrated in the pictures; they should not be locked together and apply only gentle pressure.

•The hands move in opposite directions. When one hand goes up the other goes down, a circular motion accompanies this so that no skin is being pulled apart and thus placed under tension. This is very important as if the hands move towards each other it will be putting stress on the scar. This will be discussed and demonstrated by the senior sisters during ward rounds in the main hospital and in the primary assessment.

13.2 Regular observation: by this I mean regularly looking at your stump to check for any sores or blisters (see below), you must remember to check the areas of the skin that are inside or near to your socket. So, for below knee amputees it includes the back of the

knee and lower part of the thigh and for above knee amputees it includes the groin, the buttock and the area covered by any belt or liner. You will find this easier if you have a small mirror to view it, then you can look all around. If you have any concerns, then you ring the SMRC and we will arrange an appointment to see you as soon as possible. It is important that you let us know, as small things can become large in a very short time.

13.3 Washing and drying: when you are wearing an artificial limb the socket is a warm, dark enclosed space that does not get any 'air' and thus can get a little 'sweaty'. Unfortunately, this is a perfect environment for fungal infections to develop (more later on the signs and symptoms of a fungal infection) and this is why daily washing and drying of the stump is so important, followed by the stump massage described above (**13.1**).

14. What are the common problems that can occur with my stump and what can be done about them?

14.1 Fungal infections: can occur easily due to the warm, sweaty and enclosed environment of wearing an artificial limb. The signs to look for are:

Redness of the skin: this is a common sign of problems with the stump skin including early sores, blister formation, bacterial infections, rashes and dryness. With fungal infections the skin tends not to be swollen and there usually are small spots of redness near the main patch of redness. These are called satellite lesions and are small areas of fungal infection.

Itchiness of the infected area: this is caused by a reaction to the minor inflammation that occurs with the fungal infection.
Flakiness of the skin and changes in smell / odour tends to occur; this can be either significant or quite subtle, like dry skin.

14.2 Inclusion cysts and infection: occur usually around hair follicles and are small infections in the base of the hair follicle that becomes blocked and a bacterial infection can ensue. There can be infection in the skin itself, this is called cellulitis. These will usually get better on their own but may require antibiotics and medical expertise should be sought if the surrounding skin becomes infected.
It is usually quite sore and this can be eased by adjusting the prosthetic socket to make more room for the area around the sore.
It is better to arrange an urgent appointment at the SMRC to be reviewed; we can arrange a prescription for antibiotics to treat it.
Occasionally the skin becomes chronically infected, this is because the scar tissue that forms in the tissue as a result of repeated infections does not have a good blood supply and the antibiotics do not get into infected tissues properly. This can lead to the necessity of a minor surgical procedure where the abscess that is formed needs to be numbed with local anaesthetic and incised to allow the pus to be removed.
If the area becomes persistently affected, then the area can be surgically removed by a plastic surgeon; this is very rare.

14.3 Stump sores: occur as a result of the socket repeatedly rubbing and pressing on the same spot on the stump. This causes the skin to be rubbed and swelling to occur in this area. The swelling of the area causes more pressure to occur as the rubbing means there was little

space to begin with and this is made worse by the swelling.

If the pressure is not relieved by either not wearing the socket for a while (usually a week to 10 days), or by changing the socket so that the pressure is relieved, the sore will get worse. This is carried out by heating that part of the socket and pushing it out; when it cools down there is a space around where it was causing pressure.

14.4 Blisters: can occur in exactly the same way that the sores are described as above. However, the skin is raw underneath and it is better to not wear the limb and allow the blister to heal. This is the ideal and is not always possible; relieving the pressure as described above is the next best thing, if the blister bursts, then we usually dress it with an antiseptic dressing (such as an iodine dressing) to prevent infection as described above.

15. What should I do with all my shoes?

DO NOT THROW THEM AWAY!! YOUR SHOES OR TROUSERS. This is a common reaction to being told that you are about to have an amputation. But please do not throw out your shoes, socks and trousers; we cannot promise that you will use both your shoes again, but it is quite possible.

At your primary assessment at the SMRC we will have a chance to discuss what use they may be.

They may be used for

- Artificial limbs
- For use in walking
- For cosmetic use only

16. What clothes should you wear?

Well, this depends on what you're coming for and what level your amputation is.

(Pictured: Patient doing balancing exercises)

If you are coming for an examination of your stump, then a lot of patients like to wear clothes that retain dignity. Shorts for both men and women are best, they allow for full examination of the stump and examination of walking, or gait analysis.

Usually, patients will either bring a pair of shorts or more conveniently they put a pair of trousers over their shorts. There are some trousers with zips around the knee that allow the lower part of the trouser leg to be removed. Patients may choose to wear shorts and or skirts for ease of access to the examination.

17. What will my stump look like after the operation, how will it change and what can we do to assist this?

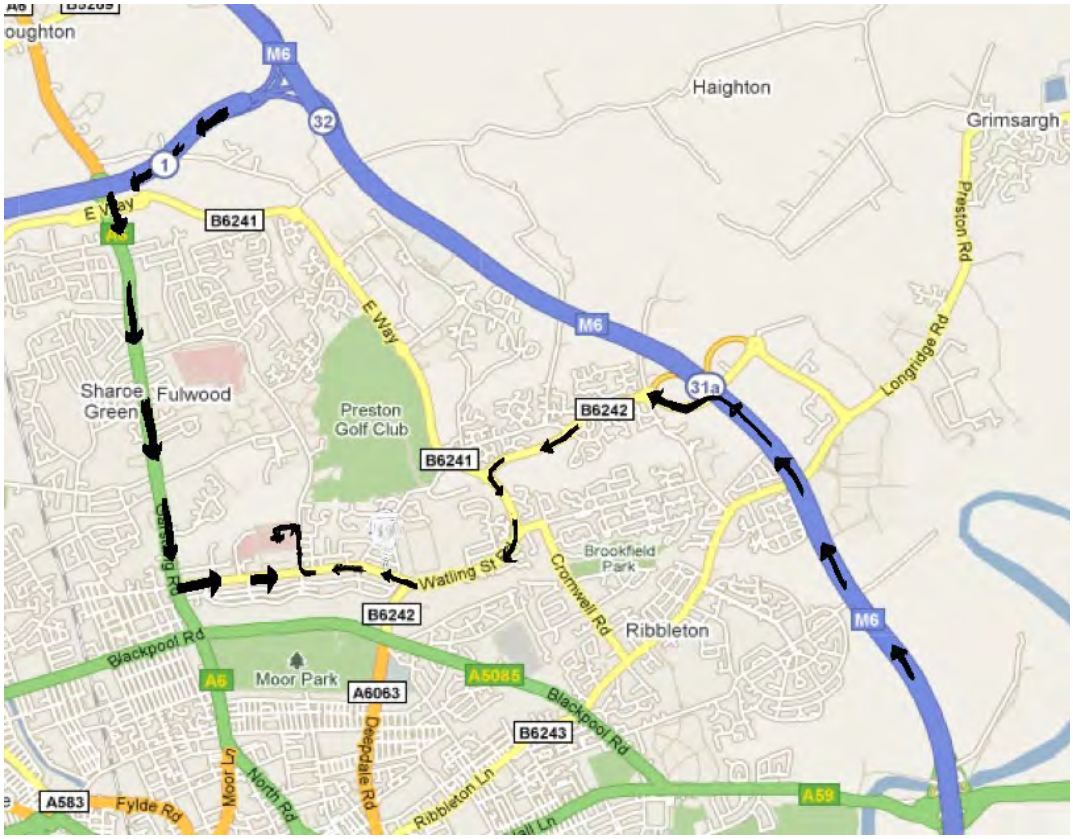
At first the stump will be quite swollen and large, the biggest decrease in swelling occurs in the first year after the amputation and mostly in the first 3-4 months. The swelling is because the operation caused the tissues to be swollen just as when you get a bruise and there is quite a bit of muscle still there.
The initial decrease in size that is noted is due to the swelling from the operation. We can help with the swelling by using specialist amputation stump shrinking socks. One is pictured below.

The stump-shrinking sock is an elasticated stump sock that puts more pressure through the end of the stump and less toward the opening of the sock. This helps the swelling go down and helps the wound to heal. It also speeds up when we can perform the first cast and thus get your first prosthetic leg.

18. What and where is the Specialist Mobility Rehabilitation Centre?

The Specialist Mobility Rehabilitation Centre is the ground floor of the Preston Business Centre, (Watling Street Road, Fulwood, Preston, PR2 8DY, Tel – 01772523852).

How to get there:
From the Royal Preston Hospital: the patient entrance (as pictured below and marked by a large E on the map) is located to the rear of the building. This is most easily accessed from Sharoe Green Lane (marked on the diagram below), turn right at Bhailok Square, the car park is on the left.



Directions to Watling Street Road and Sharoe Green Lane from the A6 and M6/M55 J32

Exit at junction 1 on the M55 and head towards Preston City Centre along the A6 (Garstang Road).

Turn left onto Watling Street Road approximately 2 miles down Garstang Road.

After about 0.5 miles you will see an impressive stone Victorian building on the left as you approach a set of traffic lights (there is a post office on the right.)

At the traffic lights please turn left onto Sharoe Green Lane.

Take the first left into Bhailok Square then drive past the small brick building and turn left into the car park, the entrance will be ahead of you.

Directions to Watling Street Road and Sharoe Green Lane from the north bound M6.

Exit the M6 at junction 31a and follow the slip road to the roundabout.
Take the third exit and carry along to the next roundabout and go straight across.
At the next roundabout turn left and carry on until a T-junction.
Turn right at the T-junction and carry on until the junction with Fulwood Army Barracks on the right.

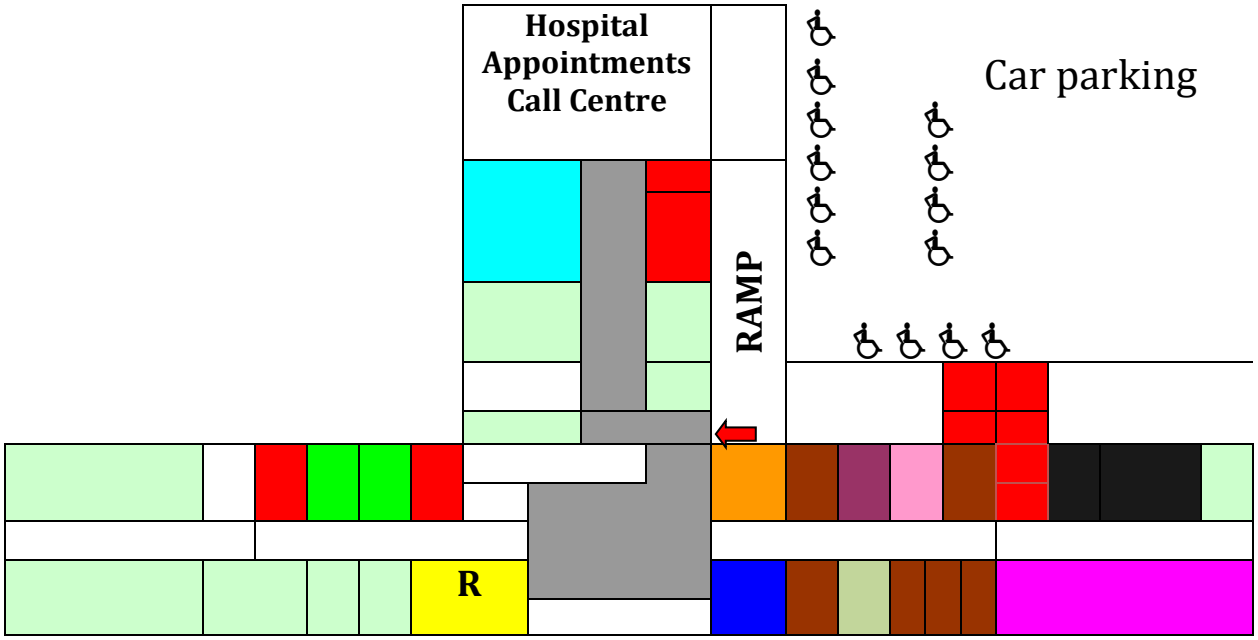
Take the right filter onto Watling Street Road, at the next set of traffic lights turn right onto Sharoe Green Lane.
Take the first left into Bhailok Square then drive past the brick building and turn left into the car park, the entrance will be ahead of you.

19. What is the layout of the unit and can I get a cup of tea there?

The Specialist Mobility Rehabilitation Centre (**SMRC**) is a Centre which deals with 3 areas of medicine: wheelchair services, amputee rehabilitation and provision of orthotics.
The wheelchair service covers the provision of wheelchairs from basic manual chairs, probably like the one you have, to highly specialist seating systems, such as those used for patients with cerebral palsy and scoliosis.
The SMRC covers wheelchair provision from Colne and Blackburn in the east, to the coast to the west, south to Preston and north as far as Barrow in Furness.
The amputee service, which this book is mainly about, covers the

above areas but includes Chorley to the south.

An orthosis is a medical device that supports the body. Examples of orthoses are knee braces and special shoes.



SMRC Layout

	Toilets		Medical room		Physiotherapy
	Orthotics Assessment Room		Fitting room		Admin/workshop
	Reception **R**		Psychology		Wheelchair assessment
	Upper limb Fitting room		Gym		**Restaurant**

The layout of the department is a long corridor with reception at the middle.

If we start at one end of the corridor the first quarter is the wheelchair services and gym, the next quarter is the amputee rehabilitation clinical areas, the other side of reception is administration and a clinical area for orthotics. The last quarter of the corridor is the manufacturing end where the limbs and orthotics are made or altered. The last part of the unit is the area to the right as you walk in; this has clinic rooms, the playroom and the restaurant.

The restaurant is open from 9am to 11am for breakfast, 12pm-

1.15pm for lunch and there are vending machines for all other times, although the Healthcare assistants will have to get these for you if there is a paediatric clinic in the afternoon (most afternoons) when this area becomes a paediatric waiting room and is only accessible for patients and family/carers attending as well as NHS staff.
So, you will be able to buy a cup of tea or a cup of coffee, or a sandwich or a biscuit, or a cup of porridge or a...

If you are diabetic or need help getting food or drinks, please contact one of the health care assistants or nurses.

20. Who can come to my appointments with me and what else should I bring?

On your first appointment anyone you like can accompany you, although it would be best if you bring someone who you can discuss things with afterwards.

The other things that would be useful would be to bring a list of your medication and dressings with you and a list of any questions you might have. If you think of questions than it would be better to write them down because you might forget them on the day of your appointment.

At a cast and measure appointment please bring the shoe from the side that has undergone the amputation. It is also best to bring a swimming costume or shorts to change into for the appointment.

21. The ‘dos and don’ts’ of prosthetic use

The artificial limb is still the property of the NHS; yes, it is yours to use and yes it will not be used for anyone else, but the NHS is responsible for it and responsible for replacing it if it gets worn out or breaks.
But we have limited funds so please look after your artificial limb, if it is lost or flagrantly damaged you may be required to partake in a discussion regarding further limb provision and funding of such items.

The do’s

- Only use the limb for the activities that the rehabilitation team advise.
- Call us if there is a problem with your stump or your artificial limb or your wheelchair or your orthosis (if you have one of course)
- Look after your prosthesis by keeping it clean and dry

The don’ts

- Do not alter your prosthesis in any way, it will not be safe
- Do not get your prosthesis wet
- Do not use your prosthesis or wheelchair for inappropriate purposes such as
    - Hitting things
    - Doorstop
    - Flowerpot
- Do not throw away, even if the bits have to be replaced in another country, we can still reclaim if still in warranty!!

22. Is my weight a problem, will it be a problem, why might it be a problem in the future and what can I do about it?

The more weight that you have to carry the more effort and energy that you have to use and the more tired that you will be.
When looking at your weight you should consider that having had part of your body amputated your ideal weight should be lower as a result and thus your Body Mass Index will need to be lowered too.
The body mass index is your weight divided by the result of your height multiplied your height.

$$\text{Body Mass Index} = \frac{\text{Weight in kilograms}}{\text{Height x height in meters}}$$

Any adjustment to this will be a proportional adjustment dependant on the amount of tissue you have had removed, for a below knee amputation it is about 5 percent and for an above knee about 10 percent. Thus, if anyone gives you a BMI then multiply it by 1.05 for a below knee amputation and 1.11 for an above knee amputation.

You will find that there is a tendency to gain weight, as you will want to eat the same amount of food, but you will be doing much less activity and thus the food will be turned to fat and thus you will gain weight; you must look after yourself when it comes to eating.

Immediately after the surgery you will need to eat more as your body will need extra energy. However, you will find that you do not need to eat as much because you will be in a wheelchair for several weeks and you will not burn many calories up. Normally a 70 kg (11 stone)

man will use about 2000 to 2500 calories, but in a wheelchair or lying in a hospital bed you will only use about 1000 to 1500 calories. So, you can see that you have to eat less food and adjust your diet.
If you are having trouble and think that you are gaining weight, then please contact the Centre and we will ask your GP to arrange for you to see a dietician in your local vicinity. We will be starting a weight loss group at the Centre in the near future that will be aimed especially at amputees, please ask at the Centre or ring the number on the front cover to see if it has started.

23. Benefits advice

Quite often patients are not sure which benefits to apply for or what they are entitled to.

Personal Independence Payment (PIP) has replaced Disability Living Allowance (DLA), for people who were aged 16-64 years old on 18th April 2013.

DLA will remain the same for people aged 65 years and over.
Every person's needs are different and there are many different benefits available. If you need further help and advice about your benefits, below are some useful Websites:-
For information-
Personal Independence Payment (PIP) www.gov.uk/pip
For help and advice-
Disabilities Rights www.disabilityrightsuk.org/
For Carers who need support www.nhs.uk/conditions/social-care-and-support-guide/support-and-benefits-for-carers/

24. Who else may be in the Centre when I get there?

The SMRC is committed to the education of medical, nursing, physiotherapy, occupational therapy, prosthetics and orthotics students and as such there may be one of the students at your clinic appointment.
Students can gain a huge amount from talking to patients like yourself and your perspective is very valuable.
If you would prefer not to have a student there, please just let a member of staff know.

25. Is there any parking?

The SMRC has 20 or so disabled car parking spaces and many standard car parking spaces.
If you need help getting out of your car and into the Centre, please temporarily stop by the call button at the entrance to the car park. Someone will discuss with you how we can help. Please do not park by the call button, as others may need to use it.
The parking is free for those patients attending the SMRC. You should get a slip stating you are visiting the Specialist Mobility Rehabilitation Centre, it looks like this.

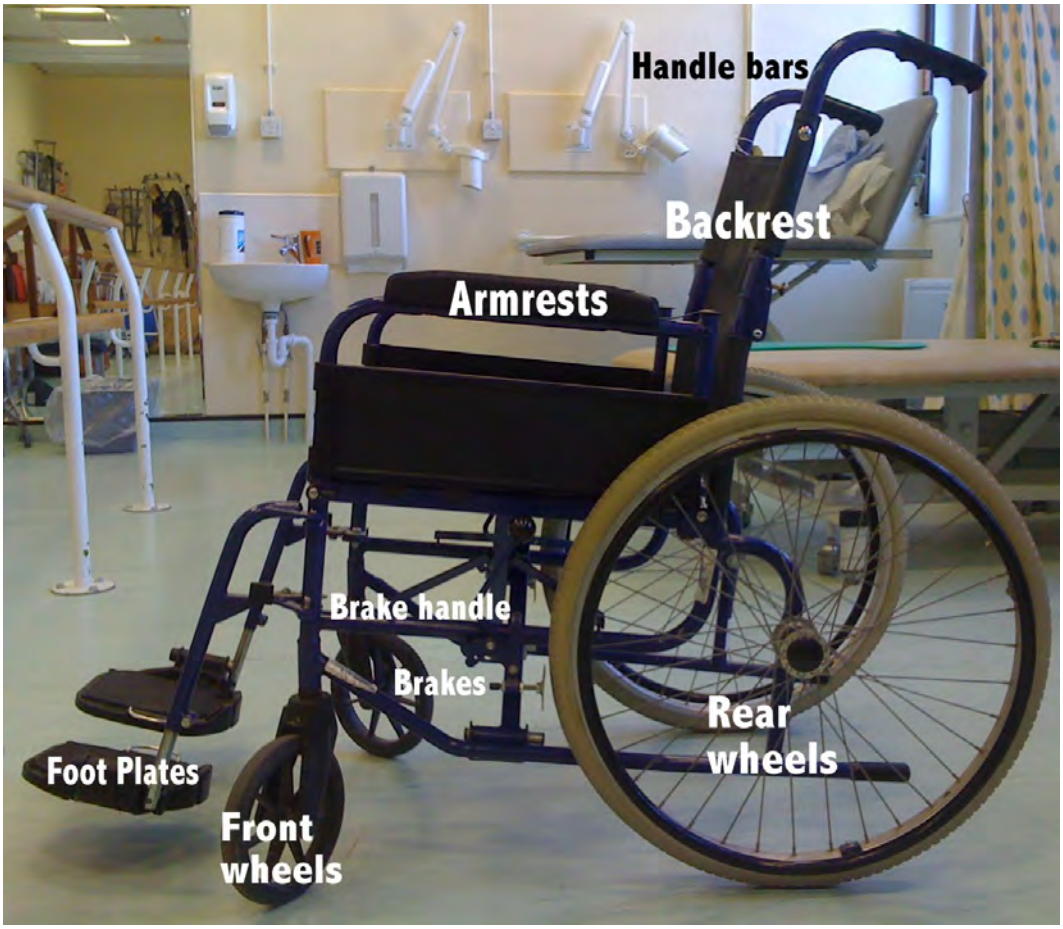
26. How many artificial limbs can I have?

This is a common question; unfortunately, we cannot provide unlimited limbs, as we only have a limited fund.
Artificial limbs are considered in terms of the primary limb; the one that is the highest specification and most expensive, a secondary limb that is usually of a more basic provision and lastly shower or water activity limbs.
Whether you get all of these or not depends on your activity levels and your needs.
It is also important to understand that the components utilised in the artificial limb are related to the activities that you do and the activity level that you are at, i.e. how far you walk, how often you walk etc.
E.g.1 If a patient uses the limb for transfers only and not for walking, they will not usually need more than 1 artificial limb.
E.g.2 If a patient works in a highly active job requiring an artificial limb with high activity components, and if a component breaks, then the patient needs a similar prosthesis in order to carry out the job. Thus, we would aim to provide the same components in the second limb and advise that the patient uses the limbs in tandem to get the most out of them.
Regrettably the funding that we have in the NHS does not allow us to provide unlimited numbers of limbs; some patients would like to have exercise limbs, and occasionally we will provide these as a second limb. If you feel that you are being restricted by your artificial limb, please contact the Centre and arrange an appointment with me to discuss any part of your limb, activities that you feel that you cannot do or if you would like to discuss the prescription policy.
Hygiene is a right not a privilege, if you would benefit from a shower

limb then please discuss this with me or your prosthetist.

27. How do I get about after my operation?

The Occupational Therapist will arrange for a wheelchair for you to mobilise with prior to being assessed for an artificial limb.
A wheelchair has the components identified below. It is important to realise that you should **use the wheelchair and not hop on crutches**. Unfortunately, I have seen several patients who have been a below knee amputee, fallen whilst hopping and become an above knee amputee; this is an entirely avoidable tragedy.
When you receive your wheelchair, you will be given a contact number of the provider who will be able to repair your chair should a fault develop.
The provider will also be responsible for the cushion, so if your cushion needs replacing then you should contact the provider.



You will also have been provided with a commode that usually doubles up as a shower chair. The wheels are usually beneath the corners of the seat and are small wheels on castors. A lot of patients will use the commode chair to scoot around using the surroundings, their carers and their remaining limb as necessary, to get about if the wheelchair is too big for the door frames and corridors.

28. Exercises to prepare yourself for rehabilitation and to do on the ward and then at home

These exercises are to do whilst in hospital, in your chair and at home to build up your upper body and torso strength and resistance. You'll need a ball like the one provided with this book.
We strongly recommend that if you are doing these exercises in your wheelchair, that you attach your lap belt and that your wheelchair has the brakes on before starting the exercises.

Discuss your ability to do these exercises with the visiting nurse, if she is not available or she is concerned then please consult (or she will ask for a consultation with) your physiotherapist and doctor prior to discharge or at your primary appointment at the SMRC.
The aim of all these exercises is to improve your strength and stamina. The exercise program needs to start slow and carefully; little and often is the key, not hard and fast. If you get worried, then make an appointment to discuss with your physiotherapist or consultant.

The Ball Circle

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball in both hands, elbows slightly bent, above your head and a little in front of you. Think of a circle in front of you, start with the ball at the top of the circle and move the ball round the circle, when you have reached the top of the circle go round in the opposite direction until you reach the top again. Continue until you have done 8 -10 circles then rest and repeat.
You should stop at any point if you feel fatigue, pain / discomfort or you have heart disease and develop symptoms of angina.

Abdominal Twists

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball with both hands close to the body with your elbows bent and pulled close to your chest. Slowly twist your chest to the right as far as is comfortable making sure your hips don't move too much. Then twist back to the middle and then twist to the left. Repeat this 8 - 10 times. Rest for a minute or two then do another set of 8.

The Ball Squeeze

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball with both hands just in front of your tummy but not touching your tummy or chest. Squeeze the ball with your hand and fingers whilst pushing in with your chest and shoulders as if you are trying to deflate the ball. Hold the position for 4 - 5 seconds then release and rest for a few seconds before repeating a total of 8 times. Then rest and repeat a further 8 times.

Ball Chest Press

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball with both hands at chest level, palms against the ball, elbows bent with the ball against your chest. With your back remaining upright and your shoulders back, move the ball straight forward to extend your arms. Do this slowly taking a couple of seconds to move your arms forward then a couple of seconds to come back again gently squeezing your shoulder blades together.

Repeat this 10 - 12 times, rest then do another set.

Ball Raise

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball with both hands at chest level, palms against the ball, elbows slightly bent. Lower the ball gently to your knees then lifting back to shoulder height, pause for a couple of seconds then repeat the exercise to a total of 10 - 12 times. Rest then do another set.

Overhead Ball

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball with both hands, with arms outstretched, and raise it up and over your head with elbows bending as the ball passes over your head to lower the ball behind your head and neck. Hold it there for a couple of seconds then bring the ball back again above your head straightening your elbow as it goes. Repeat this 10 - 12 times, then do another set.

Tri - Ball

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball above your head with both hands and elbows straight. Lower the ball behind your head and neck. Hold there for a couple of seconds then bring the ball back again above your head straightening your elbow as it goes. Repeat this 10 - 12 times, then do another set.

Inner Thigh Ball Squeeze

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball between our knees and gently squeeze the ball with your inner thigh, hold for a couple of seconds then relax. Repeat 10 - 12 times, then do it all again.

Chicken Wing Squeeze

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Hold the ball between your arm (elbow bent) and the side of your chest, just under the armpit. Squeeze the ball like a chicken would a wing to its chest. Then relax. Do this 10 - 12 times, rest then do another set.

Back Stretch

When wearing your lap belt and sitting in your chair, make yourself comfortable and try to maintain the best posture possible. With back straight and arms stretched in front of you hold the hands together and push out your hands with elbows slightly bent, head straight and arms up. Bring your shoulders forward and hold then relax. Repeat 10 - 12 times, rest then do another set. Be very careful not to bend too far forward as this may cause imbalance and you may fall forward out of your chair. If a double amputee, then don't do this exercise unless wearing both artificial limbs.

Knees Up Stretch

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Sit near the edge of the chair, hold the arms of the chair with the left arm, bring the right elbow forward to meet the left raised knee. Then grip the arm of the chair with the right arm and do the opposite. As an amputee you must be very careful as this could lead to imbalance and a tumble out of the chair. We recommend doing this when you are wearing an artificial limb and lap belt. Repeat this 10 - 12 times, rest then do another set.

Side Bender

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Reach your arms straight up above your head. Bring your right arm down and lean gently over to the left side, stretching your right side of your trunk with the right hand ending up over the left shoulder. Hold for 5 - 10 seconds then relax. Then do the opposite on the left side. Always make sure the arms of the chair are firmly attached.

Repeat this 10 - 12 times, rest then do another set.

Neck Tilt

When sitting in your chair, make yourself comfortable and try to maintain the best posture possible. Slowly tilt your head to the right shoulder holding your left arm out, hold for a couple of seconds and then bring to the centre and do the opposite.

Repeat 10 - 12 times and rest.

An enhanced centre for veteran's care

We are proud to be an enhanced centre for veteran's care at the SMRC.

For veterans who have been through the Defence Medical Rehabilitation Centre we aim to continue the high standard of care carried out there and maintain the patients in terms of prosthetics and rehabilitation.

For veterans who have undergone their amputation and rehabilitation outside of their military career our aims are to emulate as best as we can the high standards of the DMRC.

The benefits to all amputees attending the centre are numerous and include adopting pathways we developed for veterans, having a fitness suite outlined above (that I could not get funded prior to this) and the enhanced staffing to meet the demands of the veteran population.

We have very close links with BLESMA (the British Limbless Ex-Service Man's Association) and run regular drop-in clinics with the BLESMA support officer.

Paediatric clinics

Dedicated paediatric clinics run in the afternoon in the paediatric corridor where the playroom and restaurant are. The restaurant shuts at 1:15 and the corridor is then shut to non paediatric attenders or NHS staff. The restaurant becomes the waiting room in conjunction with the playroom.

The Team Members at the Specialist Mobility Rehabilitation Centre

The Nursing Team

The Rehabilitation Physician

The Specialist Physiotherapist

The Specialist Occupational Therapist

The Prosthetist

The Rehabilitation Engineer

The Counselling Psychologist

The Fitness Instructor

The Orthotist

The Podiatrist

29. The Nursing Team

The Nursing Team are led by Nursing Sisters who are highly experienced of working in this specialised service, they are supported by a Registered Nurse, Assistant Practitioners and Health Care Assistants. The Nursing team are usually the first people you will meet, and they will accompany you during your Primary examination with the Consultant.

During your first visit to the Centre, it is usual for a member of the nursing team to undertake a nursing assessment. This includes base line observations, such as pulse and blood pressure, weight and we will also ask regarding allergies and any medications you are taking.

The nursing team provide information and support, they highly experience in amputee rehabilitation, and are skilled in providing wound care and compression therapy.

We are happy to assist in supporting you to access the facilities, enabling your independence and comfort.

Please do not hesitate to approach the nursing team with any concerns or questions you may have. We strive to ensure you feel comfortable and aim to keep you informed of the clinic progress during you stay with us.

30. The Rehabilitation Physician

The Rehabilitation Physician is a hospital consultant who is a graduate from medical school, has postgraduate qualifications in Medicine or Surgery and has completed a 4-year registrar programme to be certified as a consultant in rehabilitation medicine. In the preceding section I have outlined what happens in the first appointment that we have together, usually at the SMRC. (Usually) The next appointment will be for one of the following reasons:

After delivery of the prosthesis

After a further course of physiotherapy

After a period of district nursing attention for a wound that has not healed fully

After review by another consultant such as a diabetologist or surgeon

After the prosthesis is delivered, we will have a further appointment 4-6 weeks later, after that the appointments will be arranged for the

following reasons:

Just to review how you are getting along with your artificial limb

To assess if we need to change any components – you should let me know and arrange an appointment if there are things that you feel the artificial limb is stopping you from doing.

If another health care professional requests that I see you, such as a prosthetist, sister, GP, surgeon, orthotist or other.

Lastly, if you would like to discuss anything else, please ring my secretary for an appointment. (Telephone: 01772 523852/523833)

31. The Specialist Physiotherapist & Physiotherapy Assistant (THIS IS FOR INFORMATION AND SHOULD BE USED IN CONJUNCTION WITH YOUR INPATIENT TEAM OR OUTPATIENT PHYSIOTHERAPIST)

The specialist physiotherapist is a highly trained senior physiotherapist who has had many years' experience in treating amputees.

<u>Stretching and strength building exercises</u>

These are exercises that treat the fixed flexion deformity complication that was outlined earlier. The exercises build up muscles that are used for walking and transferring.

31.1 Transfers – this is being able to move from a bed to a chair or to a commode, there are 3 main types of transfer:

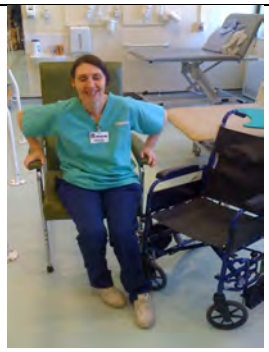
Sideways or sliding board transfer – this is a type of transfer where

the patient removes the arm of the chair with the chair next to the bed or commode, the patient then applies the brakes, swings the foot plates out of the way and uses a board which they place as a bridge half under their bottom and half on the bed/commode. The patient then slides across pushing up with their remaining foot.

			
Position the chair close to the destination item	Apply the brakes and retract the foot plates	Remove the arm rest	Demonstration of the position of the board
			
Lean over to the opposite side and place the sliding board under your bottom	Lean to the side, place hand on the end of the board to stabilise it and slide across, pushing gently with your foot or feet	When fully across, lean over to the side to allow removal of the board	Remove the board and place on the chair in preparation for the return.
Sideways transfers can be done with or without the sliding board.			

Pivot transfer – this is a type of transfer where the patient stands up on their remaining leg whilst holding onto the arms of the chair or a frame. The patient stands up and turns (or pivots) on their remaining foot once stood. The patient usually leads with the remaining leg and

the side of the wheelchair may need to be removed for convenience (obviously a frame is required in this instance).

			
Set the position of the chair as above, apply brakes and retract the foot plates, place hands on arm rests and place feet towards the destination	Stand with support of the arm rests. When stable transfer the leading hand across to the arm of the destination.	Shift weight over to destination chair, then transfer the trailing arm over to the arm of the destination chair	Lower weight onto the destination chair.
Standing or pivot shift transfer.			

Bilateral amputees can use forwards and backwards transfers; this is where the front of the wheelchair is brought right next to the destination object. The patient then applies the brakes and shuffles forwards to get onto the destination object and backwards to get back onto the wheelchair.

31.2 Strength, stamina and flexibility training

When transferring as stated above or balance training below, improving your strength, stamina and flexibility will all help.

The exercises that the physiotherapist teaches you whilst you're in hospital and in the out-patients clinic are essential for you to have the best chance of using an artificial limb in the best possible manner.

The most important exercises:

- BEING ABLE TO STRAIGHTEN YOUR HIP ON THE AMPUTATED SIDE, THIS IS DONE BY BENDING YOUR THIGH BACKWARDS WHEN LYING ON YOUR OTHER SIDE AND THEN, WHEN ABLE, WHEN YOU ARE STANDING UP
- BEING ABLE TO STRAIGHTEN YOUR KNEE ON THE AMPUTATED SIDE (IF YOUR AMPUTATION IS BELOW KNEE); THIS CAN BE DONE IN BED WHILST AN INPATIENT AND STANDING IN OUTPATIENTS

Please see the exercises below, I am sorry about the repetition, but I think this is very important.

This is the most important exercise for the above knee amputee because of the risk of developing a fixed flexion deformity in the hip and thus being unable to straighten it.
This loss can affect the ability to walk. It is carried out whilst lying on the non-amputated side. This can be done whilst an inpatient.

This exercise is to strengthen the muscles and is good preparation for walk training.

This is a more advanced exercise that is usually carried out in the outpatient's physiotherapy department and should not be tried without a physiotherapist being present.

This exercise is good for the hip and knee; the importance is to be able to straighten the hip and the knee.

31.3 Standing and balance training

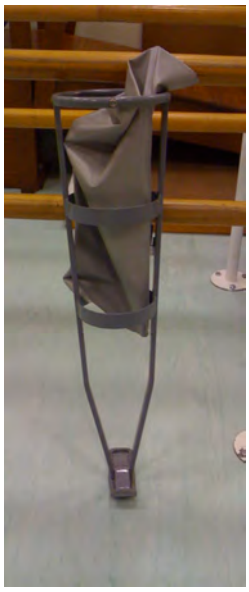
The physiotherapist will help you to learn to stand up on your remaining leg and the extra precautions you need to take when doing so. This may sound simple enough but without the weight of the amputated leg you will find that your balance will be off; the good news is that your body will adapt with the help of the physiotherapist who will use various techniques to improve your balance.

Once you get an artificial limb more training is required to stand up having donned (put on) an artificial limb. There are various techniques that are used to improve balance whilst wearing an artificial limb.

Walk training

Before you get an artificial limb and once you have managed to stand up on your remaining leg you will start walk training with one of the following physiotherapy aids.

31.4 ‘Pneumatic Post Amputation Mobility Aid’.



- Other names for this are PPAM Aid, balloon leg or artificial leg.
- This is for use with above and below knee amputees but does not allow the knee to bend in it
- The simplest and safest but least comfortable

31.5 Femurett

- This is only for above knee amputees
- Has a knee unit that can be set to be flexible or locked in a straight position.

31.6 Amputation Mobility Aid

- This is only for below knee amputees and allows your knee to move whilst walking.

Once you have managed the above you will move to using an artificial limb that has been made by the prosthetist.
The training to walk with an artificial limb is the next step and requires a great deal of perseverance.
Like most things it is not easy, but the physiotherapist will help you; if you have any problems, please discuss them with the physician or physiotherapist.

31.7 How to get up from the floor: Falls training

Being able to get safely down to the floor and safely up from the floor is a very useful skill. If you were to fall you can get up and there are situations when it is easier to do tasks whilst sitting on the floor. A classic example of this is using stairs by 'bottom shuffling' up and down the stairs. This is not for everyone but can be useful.

31.7.1 Getting up from the floor or from a fall with the use of a chair and the footstool or cushion:

Take a couple of minutes to compose yourself and check you have not been injured in the fall.
If there is help near, then explain what you are going to do.
If your artificial leg fits and is comfortable then leave it on. If not, then take it off. If there an artificial knee with a lock, then lock it out. Bottom shuffle back until the footstool or cushion is behind you. (Remove the cushion if no footstool and place in front of the chair, it will lift you a little higher and also lower the height you need to get on to the chair.


Place your hands on the footstool and lift your bottom off the ground and onto the stool or cushion. Rest a little, this can be tiring and after a fall we all get nervous and tend to rush things, leading to accidents.


Next place your hands on the chair seat base and lift your bottom on the edge then shuffle back.

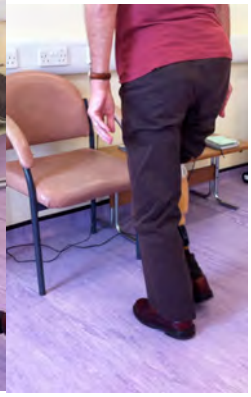
Ring your GP if you have any injuries and ring the SMRC to arrange an appointment to get the limb examined and discuss what happened.

31.7.2 Getting up from the floor or from a fall with the use of a chair:

Take a couple of minutes to compose yourself and check you have not been injured in the fall. If there is help near, then explain what you are going to do.

Bend your remaining knee so your foot is flat on the floor. Roll towards your good side (for above knee amputees – unlock your knee)

You may need to crawl to retrieve your sticks and place them against the chair for use later



Get into a kneeling position with your artificial and remaining leg. Place your hands on the base of the chair and push up whilst also pushing up with your remaining leg. Once upright sit or use sticks.

Ring your GP if you have any injuries and ring the SMRC to arrange an appointment to get the limb examined and discuss what happened.

31.7.3 Getting up from the floor or from a fall with the use of walking sticks:

Take a couple of minutes to compose yourself and check you have not been injured in the fall. If there is help near, then explain what you are going to do.

Bend your remaining knee so your foot is flat on the floor. Roll towards your good side (for above knee amputees – unlock your knee) You may need to crawl to retrieve your sticks.

Get into a kneeling position with your artificial and remaining leg.

Place the sticks in front of you, either one in each hand or with both hands together and ends apart.

Bend your remaining leg up so the foot is flat on the floor. Push yourself up using your remaining leg and your weight through your sticks. (For above knee amputees with locks on the knee, lock the knee.)

Ring your GP if you have any injuries and ring the SMRC to arrange an appointment to get the limb examined and discuss what happened.

31.7.4 Lastly - Bottom Shuffling: This should be taught to you by an experienced physiotherapist and possibly physiotherapy assistant.

If ascending the stairs, then transfer to the second step of the stairs from the wheelchair in the manner that you have been taught is safest for you. This is the same way as the footstool in 30.7.1 but repeat for each step.

31.8 Walking up/down ramps and/or stairs

<u>Downwards on ramps</u> (small steps)

1. Place walking aid down onto ramp.
2. Step down with <u>artificial limb first</u>.
3. Then your remaining leg – remembering to do small steps.
4. Place your walking aid further down on the ramp.
5. Repeat steps 1, 2 and 3 again until at bottom of ramp.

Upwards on ramps

1. Place walking aid up onto ramp.
2. Step up with remaining leg first.
3. Then your artificial limb – remembering to do small steps.
4. Place your walking aid further up the ramp.
5. Repeat steps 1, 2 and 3 again until at the top.

Walking up stairs

1. Stand close to the stairs. Hold onto the handrail with one hand and place the stick in the other hand.
2. First take a step up with your healthy leg.
3. Then take a step up with your artificial limb.
4. Then bring your stick up on the step.
5. Always go one step at a time.

Walking down stairs

1. Stand close to the stairs. Hold onto the handrail with one hand and place the stick in the other hand.
2. First put your stick one step down.
3. Then take a step with your artificial limb.
4. Then take a step down with your healthy leg, onto the same step as your artificial limb.
5. Always go one step at a time.

31.9 Deep Ultrasound Therapy

This can be used to alleviate muscular pain.
Patients who have had an amputation of part of an arm, forearm or hand may gain benefit from the physiotherapist who will engage in flexibility training to maintain the movements of your shoulder and upper limb. They will also work with you to improve the balance between the shoulders.
They will work with the occupational therapist to improve your arm function, which can significantly help with rehabilitation.

32. The Test Track

The test track has been designed to be a safe environment to assess the functioning of different prosthetic components on different community terrains. E.g. tactile paving, cobbles, slopes, steps and kerbs.

33. The Occupational Therapist

The specialist occupational therapist is a senior occupational therapist who is highly experienced in wheelchair provision and amputee management.

For the lower limb (leg) amputee the occupational therapist looks at your abilities to learn to do new things, such as safely use a wheelchair, safely transfer (as described above), safely use a toilet etc. The occupational therapist takes these tasks very seriously although they may seem very simple to you and you may get frustrated by this, however it is very important that you are assessed for these simple things before we can move onto the more complicated things.

Wheelchair provision: the inpatient occupational therapist will measure you for an appropriate wheelchair. You will need a wheelchair to get about the ward and other areas until you can be assessed for an artificial leg.

The access visit: this is a visit which the occupational therapist will make to your home to make sure that it is safe for you to be at home. They will assess the following-

The entrance to your home needs to be assessed for access with a wheelchair, as do the doorways within your home to ensure that your prescribed wheelchair will fit through them. The entrance also needs to be reviewed to see if a ramp needs to be fitted. If a ramp needs to be fitted this can take a while as it needs to be done by the community team, sometimes a temporary ramp is fitted, but there are

occasions where patients have to wait and may be discharged home whilst still waiting.

The layout of your home is important to assess how easy it will be for you to live there in a wheelchair, can you use the kitchen, where will you sleep, how will you use the toilet and wash yourself? The occupational therapist will work all these things out with you.

Sometimes it is necessary to bring your bed downstairs, sometimes a commode is required downstairs, sometimes meals on wheels or carers are needed to make it safe for you to go home, the occupational therapist will try to assess and facilitate these things in discussion with you.

For the arm (upper limb) amputee the occupational therapist has a very different role:

The occupational therapist is very experienced in showing you how to manage doing everyday activities such as washing and dressing, preparing and cooking food and other household activities.

There are many clever devices to help in the different activities and the occupational therapist will discuss these with you.

The use of artificial arms can help in day-to-day activities by

- Holding objects for stability
- Moving objects

The occupational therapist will help you learn to use the prosthesis. There are different types of arm prosthesis and they will be described later on but one of the types is called a myoelectric prosthesis; this type is electrical and takes a lot of training to use, this is all carried out with the occupational therapist and we will discuss it before embarking on the training.

34. The Prosthetist

The prosthetist is a highly trained member of staff who is a graduate from a 4 year university programme. The role of the prosthetist is to create the artificial limb in conjunction with the technicians.

The prosthetist will first see you after the physician. They will arrange a separate appointment for what is called a ‘cast and measure’ appointment.

In this appointment the prosthetist will make a plaster cast of your post-surgical limb (referred to by most patients as a stump). This is done by using plaster of Paris that is applied to the stump over cling film, which is used to protect the skin.

The taking of the cast is a highly skilled activity that takes significant experience and training.

After the cast has been made a ‘positive’ cast is created by filling the cast with plaster of Paris then stripping it off to create an impression of the stump.

This is altered by increasing the amount of plaster over certain areas and removing plaster in other areas to create a socket that will put more pressure on certain areas of the stump that can take pressure without discomfort, and relieving pressure over areas of the stump that cause discomfort under pressure.

This is used to create a socket by draping the materials used over the plaster impression.

Once the socket is made the second appointment is made to check

that the socket fits well and is comfortable. Sometimes this is fitted to the components of an artificial limb and other times just the socket is tried. This appointment is called the ‘Fitting’ appointment; areas that are uncomfortable can be modified accordingly by the prosthetist before moving to the next appointment.

The third appointment is usually the delivery appointment, this is when the limb is finally finished and given to the patient or sent to the physiotherapist to continue with your walk training.

The next appointment will be a review by the prosthetist to check that all is well; these tend to be carried out at regular intervals that decrease over time. Follow up appointments can be made by any member of the team, your GP and of course by yourself. If you have any problem with your artificial limb, then you must let us know so we can fix it.

35. The Technician

The technician is a member of the team that carries out the maintenance and technical aspects of putting together the components that make up the limb.

There are many faults that can develop in the artificial limb, some will require a prosthetist, but a technician can manage the simpler problems and repairs.

36. The Counselling Psychologist

The SMRC provides a Psychology service that offers a range of psychological interventions, that are delivered on an individual basis – specific to the needs of the client.

Patient Centred Care

At the heart of Counselling Psychology is the person-centred approach, which places the client at the centre of the treatment. Part of this process involves developing a robust collaborative relationship with the client based on trust and respect. Ultimately, the goal is to empower clients in order to support them to attend to their issues, by understanding and managing them. Then, over time, making positive and meaningful changes to their thinking and behaviour.

Counselling Psychologist

The SMRC has a Chartered Counselling Psychologist who uses psychological theory in their therapeutic work, to facilitate meaningful change for clients that are pending or have undergone amputation surgery, at the SMRC.

Scientist-Practitioner

The Counselling Psychologist has completed a Professional Doctorate in Counselling Psychology. The professional and

academic training is predicated on the notion of the “Scientist-Practitioner Model”, which aims to integrate scientific knowledge with real clinical practice in psychology. Each will inform the other and this can be seen in the implementation of evidence based psychological models that are recommended in national guidelines such as NICE (National Institute for Clinical Evidence), for example CBT (Cognitive Behavioural Therapy) more widely within the NHS and here at the SMRC.

Assessment & Psychological Interventions

Our Counselling Psychologist is trained in a range of therapy models and through completing a thorough assessment, will then formulate an understanding of the client’s difficulties and collaboratively develop a bespoke treatment plan to meet their needs.

Cognitive Approaches

Cognitive based psychological interventions usually work in the here and now to seek to collaboratively understand what is triggering and maintaining the client’s symptoms e.g. low mood. Then by working at the level of thoughts, feelings and behaviour a treatment plan is established.

Cognitive approaches are used to help, but are not limited to the following:

- Depression and low mood
- Anxiety Disorders: Generalised Anxiety, Social Anxiety, Panic and Phobias

- Emotional Regulation
- Post-Traumatic Stress Disorder
- Pain Management
- Body image difficulties

Counselling

Counselling is a talking therapy that uses skills at the core of all psychological interventions. The goal is to listen to the client to help them begin to process their feelings and make sense of their difficulties.

Psychotherapy

Psychotherapy, like counselling, involves understanding the client difficulties, however the intervention also takes place at the level of the personality and tries to understand how early experiences have shaped the individual. This may be suitable for moderate to severe presentations.

Psychology Review Sessions and Discharge

After 6 sessions the psychological therapy is usually reviewed and if the goals have been met then the client is discharged. However, if more sessions are required this is established in line with therapy goals. A flexible approach is maintained so that the intervention always adapts to the client needs.

Pre-Amputation Psychological Assessment

A Psychology assessment is completed at the pre-amputation stage to ascertain cognitions and emotions prior to such a major operation and to clarify readiness for amputation from a psychological perspective.

Post-Amputation/Adjustment Reaction

This intervention is based around the presenting difficulty that may have emerged after the amputation surgery e.g. low mood. The goal is to support the client to process their feelings and establish a new understanding of their life post-amputation. Furthermore, if necessary, develop new coping skills.

Pain Management

After pharmacological intervention has been exhausted (or frequently in combination with) talking therapies such as CBT are used to provide the client with strategies to cope with their phantom pain. By the end of 2022 we hope to offer Hypnosis for pain management sessions.

Trauma

Understandably, often the client has found the amputation itself or the event leading to the amputation traumatic. Therefore, psychological input may be required. Sometimes the client may have early traumas that were then exacerbated by subsequent traumas, sometimes

leading to a diagnosis of complex PTSD. Appropriate cognitive based psychological approaches are used, following an in-depth psychology assessment. At the SMRC we offer EMDR (Eye Movement Desensitisation Reprocessing) therapy that allows the client to process, make sense of and integrate the traumatic memories – so that they are hopefully less distressed by the past and develop more internal stability.

Bereavement Counselling

Sadly, losing loved ones is a difficult part of life that everyone faces at some point. It can be something that is feared and difficult to make sense of. Grief can make an individual question the meaning of life therefore, at such a time, therapy for bereavement can provide a safe space for clients to talk about how they feel, find meaning and develop strength to face the future. This intervention works at the pace of the client, and they decide with the psychologist when they may be ready for discharge and, if necessary, whether they need to be signposted to bereavement services.

Cognitive Testing

Cognitive tests to measure memory and cognitive abilities are conducted as needed.

Couples Therapy

Suffering from severe pain and experiencing limb loss can significantly change an individual's physiology and mental health.

Inevitably this can impact close relationships and sadly a breakdown in communication can permanently damage relationships. Sometimes couples therapy sessions can help highlight any misunderstandings and work on communication skills – to support day to day life. Again, if long term treatment is required, they can be signposted to relationship therapy services.

Remote Sessions

All sessions take place at the SMRC; however, some are conducted on the telephone.

37. The Fitness Instructor

The SMRC has a small fitness suite that has been funded as part of the centres role for delivering enhanced care for veterans with amputations.

The equipment is aimed at rehabilitation and especially for promoting post rehabilitation exercise for amputees.

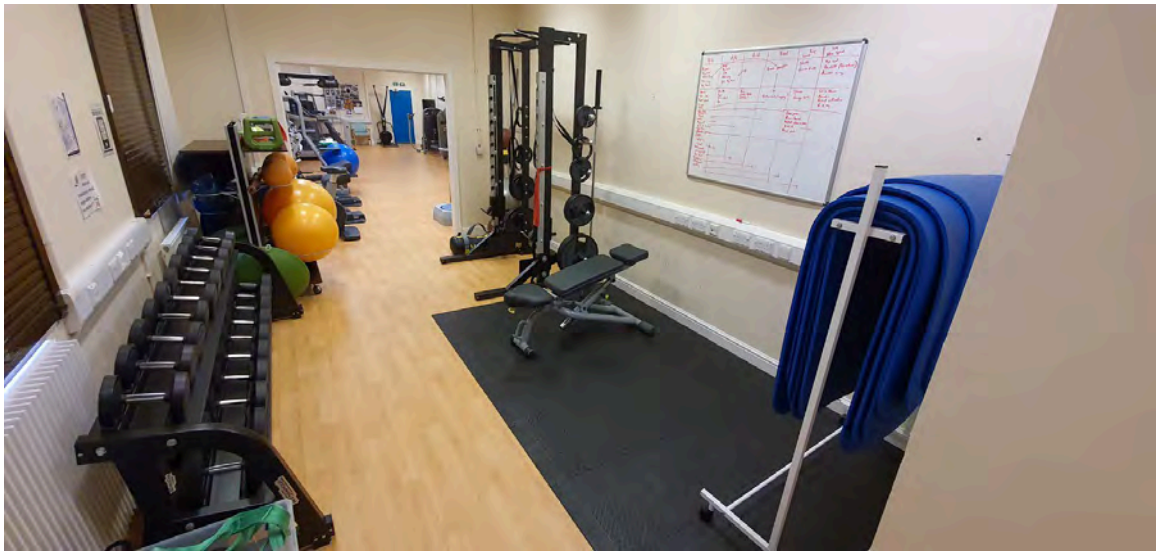
As the funding is for veterans, they take priority for appointments and are sometimes on long-term programs. For non veteran patients the aim is for a 6 week program to get an exercise regime in place, with the expectation that the amputee will then attend a local fitness centre to carry out the established program and lead to regular 3 monthly or longer reviews, to ensure the program is still appropriate.

1 member of staff is a sports and amputee physiotherapist and manages the team.

1 member of staff is a certified level 4 physical training instructor, who carries out the assessments and draws up the appropriate exercise programs.

2 certified fitness instructors carry out the programs with the patients and the outcome measures to ensure there is improvement. If the program does not lead to any improvement, then they will refer back to the physical training instructor, who will discuss with the wider team. If there are no changes that can be made, like all other treatments that are not working, further fitness suite appointments will cease.

The purpose of the gym will be to engage patients in exercise with other amputees with the aim of improving their general health and encouraging exercise as part of one's daily life. They will work out programs for patients and offer review appointments, as well as running regular classes in the gym for small groups of patients. There are limited showering facilities available in the form of the unit wet room for those doing a really strenuous workout!!



38. The Orthotist

The orthotist is a professional who has a 4 year university degree in prosthetics and orthotics, just as the prosthetist. However, where a prosthetist will create something to replace a missing limb, orthotists create orthoses that support your natural limbs. Such orthoses are splints, custom made insoles, shoes, braces, compression garments and so on.

An example of when you might see an orthotist is if you are diabetic. As stated earlier, your foot is at risk due to the effects of diabetes on circulation and nerves. An orthotist will be able to take a cast of your foot and order a custom shoe that will protect your foot; this is very important as lack of attention can lead to a further amputation.

39. The Podiatrist

The podiatrist runs a clinic every Friday morning. Their expertise is assessing feet, especially the care of the skin and toenails. This is extremely important for all patients, but none more so than our diabetic patients, who suffer with the complications outlined in the diabetic part of this handbook. When the sensation in the foot is poor and the circulation is poor, this can lead to infections, sores and ulcers very quickly. Out podiatrist works very closely with the rest of the team and will call anyone needed into their clinic appointment to ensure the best possible outcome.

The Artificial Limb

All artificial limbs can be broken down to the following parts:

40. The Socket

The level of amputation will dictate the construction of the artificial limb and the components generally replace the parts that have been amputated.

In the following pages we shall first look at the socket and then at the different types of prosthesis dependant on the level of amputation.

40.1 Casting

The process of making a socket has been briefly described in the previous section in the role of the Prosthetist. The same process is undertaken for all sockets and the stages are reviewed again here. The stump is exposed and wrapped with cling film to protect the skin and clothing.

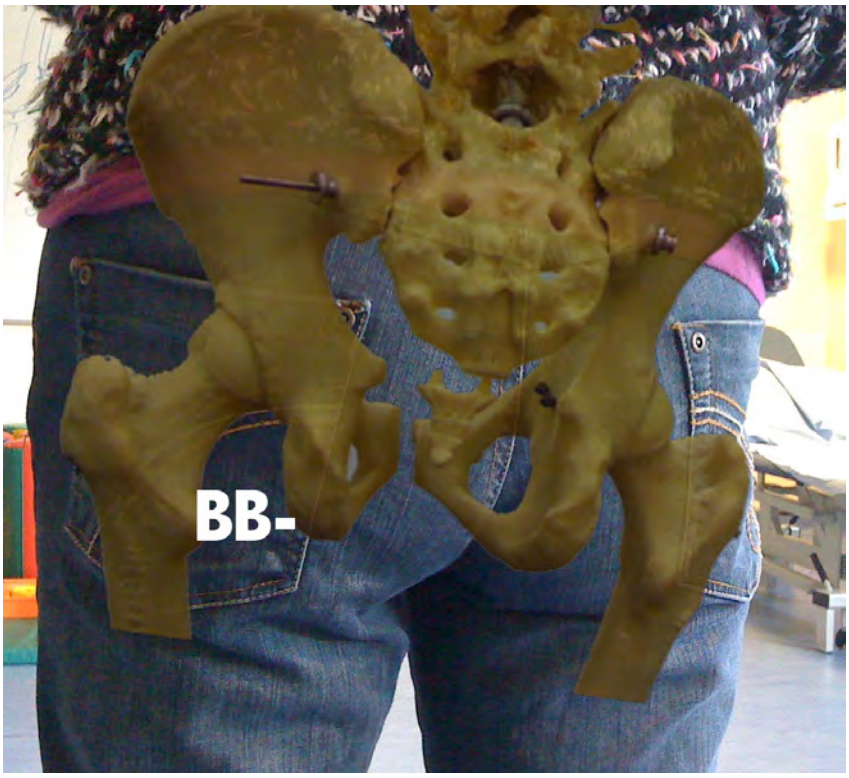
The prosthetist places the rolls of plaster of Paris in warm water until no further bubbles come out, the loose plaster is removed and the roll is applied over the cling film in layers until there is sufficient coverage, this is usually 4-6 layers.

Whilst the plaster is drying the prosthetist will shape it by pressing on areas that are going to take the most pressure-

In below knee patients

Over the patellar tendon (thick tendon below the kneecap) P.

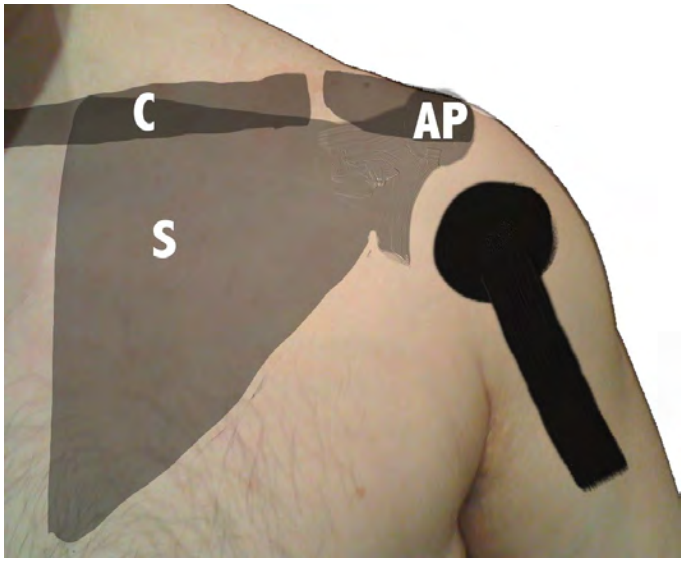
Over the paratibial areas (top, front sides of the shin bone) T



In above knee patients.
Beneath the ischial tuberosity (or bottom bone) BB

In above elbow amputations

Around the acromion process (tip of the shoulder) AP
Around the clavicle (collar bone) C
Around the scapula (shoulder blade) S



Once the plaster is mostly dry (about 5-10 minutes depending on how wet the plaster was and how cold the water used was) it is gently removed from the patient and allowed to dry fully which can take several hours but is usually left over night.
The cast is then filled with plaster and again left to dry overnight.
The rolls of plaster are then gently stripped from the outer surface to leave an impression or bust of the stump.

This is a picture of one of the cast rooms where the prosthetists make casts.

40.2 Rectification

Rectification of the impression of the cast is when it is altered to increase pressure in certain areas and decrease pressure in other areas.
To increase pressure on an area some of the plaster is bevelled away, this means that the socket will be tighter in this area when the socket is made.
To decrease the pressure on an area some plaster is added, this will create more space in the socket over this area.

40.3 Lamination

Lamination is the process of making the socket over the impression; there are 3 main types of material used

Polypropylene Carbon fibre

(Laminate no photo)

The material is layered over the rectified impression after being prepared; the preparation of the materials is different for each material.

Very often the adaptors, which will be used to attach the socket to the

components of an artificial limb, will be incorporated into the socket at this stage.

Once the material has hardened it is removed from the impression, which is then stored safely for up to 6 months.

The redundant edges of the socket are then trimmed.


Adaptor
Socket to Shin
Shin Pipe
Adaptor
Shin to Foot

40.4 Attaching the components

The attachment of the components occurs in the workshop and is carried out by the technicians and prosthetists, below is a workshop station.

40.5 Fitting appointment

At the fitting appointment the socket and attached components are tried on by the patient and the following aspects of the limb are optimised:

The length of the limb is altered to match up with the desired limb length. Most of the time this is to match the other limb, be it an arm or a leg. There are situations where there is a necessity to have an un-matching length.

For a patient who has had both legs amputated, the aim is to match the artificial limbs.

When a locked knee unit is being used it is helpful for the patient to have the artificial limb slightly shorter by 1-2 cm to stop the heel catching when that leg is swinging through.

The alignment of the limb has 2 main aspects -

The angle the components are attached to the socket, usually this is straight but occasionally it should not be.

If there is any fixed flexion deformity (as described previously).

For reasons of stability.

The position of the component's attachment to the socket; this is usually central but can be placed, for example in an above knee amputee, further back to enhance stability.

Finishing the limb is when all the attachments are secured and then the cosmesis is finished. There are 3 main types of cosmesis:

1. Foam cosmesis - these come in a pre-formed size and are trimmed down to match measurements of the patient's remaining limb so that the limbs will match.
2. Roll polyvinyl cover.
3. Laminate one piece.

After this has been done a skin-coloured stocking is applied to the limb.

40.6 Delivery appointment

At this appointment the artificial limb is delivered to the patient and final checks and minor alterations are made.

41. Types of knee joint

The human knee joint cannot be truly replaced by an artificial knee joint. The human knee joint is powered by muscles; it is light weight, very strong and on the whole self-repairing. On top of that it is full of nerves that tell the brain if the knee is bent, straight or in between. Looking at these points it is best to start with the fact that an artificial knee joint does not have any nerves and will not tell the user if it is bent, straight or in between. To get by this there are 2 main types of knee joint, the most basic is a locked knee, that when it is locked straight it does not bend. The alternative is a free knee, this does not lock when straightened, but will bend under the right conditions and the user has to learn how to walk with it, keeping your weight over the knee and using the hips to keep the knee straight.

41.1 Locked knee is good for:

- Stability
- Reliability
- Easier to learn to use
- Low weight

But has the disadvantages of:

An obviously altered walk as the patient has to tilt over to the other side when swinging the leg through (hip hitch), swing the leg out (circumduction) or go onto the toes when

swinging through (vaulting).

More tiring to use.

41.2 Free knee is good for:

- Creating a more symmetrical walking pattern
- Less tiring to walk with

But has the disadvantages of:

- More reliant on the wearer to control the knee
- More difficult to learn
- Higher weight
- Less stable

Most of the time the decision for a free knee or a locked knee is not difficult to reach, but sometimes if there is any question then usually, we will create a limb with a free knee that has a manual lock on it, in physiotherapy the patient will train with the knee free, but only use it in that mode when the physiotherapist is happy.

We will discuss this when you are ready for a limb and we work out the prescription.

42. The foot and ankle unit

There are many different types of ankle unit. The chief factors in choosing a foot and ankle joint are:

- Stability
- Weight
- Movement
- Stiffness

The choice of artificial foot and ankle unit is very much dependant on the functional abilities of the patient. For the very fit and active patient an energy returning foot such as a flex foot is beneficial. The way in which these work is like bending a stiff bar, it resists being bent and springs back to its original shape after. This leads to a very stiff foot that can be quite uncomfortable to walk on, if not enough weight is put on it to bend it.

Other units work by squashing softer more rubbery parts; this is very much like a plumber’s plunger stuck to the floor and moving the stick forwards and backwards, it does not push back that much, but does allow some movement.

Initially most patients will be provided with a multiflex foot which is of the latter design, it is easy to use, reliable, light weight and reasonably flexible.

The important thing to learn here is that you need to tell us what the limb stops you from doing and how that affects your life. At the appointment with the physician or prosthetist you can discuss this and alternative units can be looked at to meet your needs.

43. The hip joint

The real hip joint has movement forwards, backwards, to the inside, to the outside, internal and external rotation.
Artificial hip joints only copy two of the movements of the thigh - moving forwards and backwards. The socket is large and can be difficult to wear.
The best thing to do if you have had a hip disarticulation or hindquarter amputation is to come to the unit and discuss the prosthetics at a primary appointment.

44. Prosthetics for the arm

There are no prosthetics that can fully replace the function of an arm or a hand. Prosthetic arms and hands can be categorized as:

- Cosmetic limb - these limbs look like an arm and hand but the only moving parts are poseable fingers and thumb. There are 2 different types
    - Standard definition – these look like hands but are off–the-shelf covers and are selected from a catalogue of different colours and sizes.
    - High definition – these are created from castings, pictures and special photos of your other hand. These are custom made and very costly to make, however they look extremely lifelike. There is only limited poseable fingers and thumb as the fingers split with repeated movement.
- Functional limb – these have controllable moving parts
    - Body powered – these are simple mechanical devices that are controlled by a harness that travels from the hand or elbow to the opposite shoulder that has a loop harness round it. When the shoulder is brought forward then the harness is pulled and this opens the hand or controls the elbow.
        - Split hook – this is the most basic prosthetic tool for a functional limb and due to its design it is highly functional and manoeuvrable. A lot of patients find them very useful, but the utilitarian look is certainly not for everyone.

- Mechanical hand - these have either a mobile thumb or fingers and look similar to a hand and work in a similar manner to a hand, however they do not look as much like a hand as either of the cosmetic hands.

- Myoelectric hands – these are electrical hands that have small motors in them to open and close the hands. Small sensors that are built into the socket pick up the contractions of muscles and activate the motors. These have the advantages of not requiring a harness for

movement but at the cost of a much-increased weight due to the batteries and motors.

http://www.touchbionics.com/Pulse

- The prosthetic elbow joint is also either body powered or myoelectric and works in the same way as the hands described above.

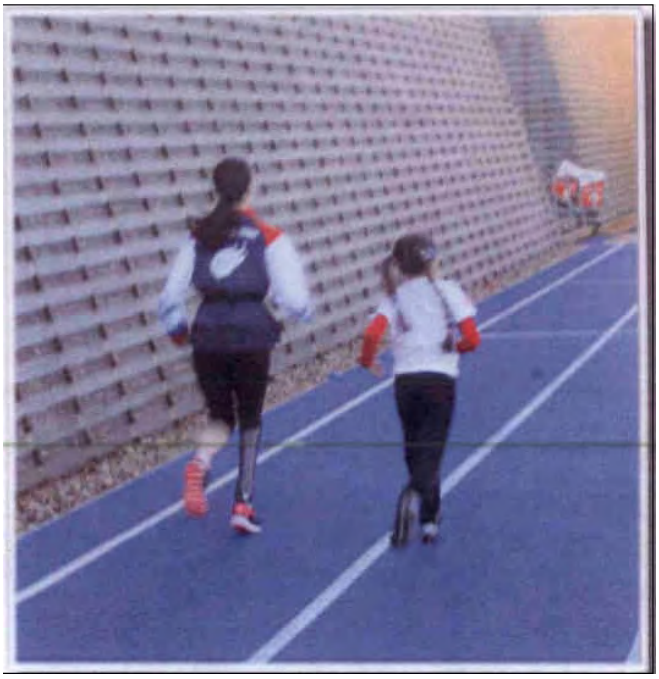
45. How else are patients supported?

- The parents support group meets periodically and each year there is a Christmas party where all the children who attend the Centre with amputations or congenital limb deficiencies and their siblings can attend.
- There is a charity called the Patients Trust Fund that is for the Centre; it funds the parent support group and other patient related matters
-

46. Patient User Group

The limb and wheelchair user group meet every 6 months. The aim of the meeting is for patients to sit together, discuss matters about the about the running of the service and to meet other amputees. There are usually presentations such as from the Limbless Association. If you would like to know the date of the next meeting, ask when you are next in or ring the number on the front of this book.
The meeting has representatives of all our patients including prosthetic limb users, wheelchair users and orthotic users.

47. Photographs of patients



Amputee preparing to skydive for charity

48. My contact details

Dr Fergus Jepson
Specialist Mobility Rehabilitation Centre,
Preston Business Centre,
Watling Street Road,
Fulwood,
Preston,
PR2 8DY,

Tel. 01772 523852 or 01772 523833 (secretaries)
Email – Marie.Etheringon@lthtr.nhs.uk
Stephanie.Tuite@lthtr.nhs.uk
Suzanne.Pilkington@lthtr.nhs.uk

49. Driving Centre Details

These Centres and the Forum are there to help you as best they can to get back to driving. The Centres have many adapted cars that you can try after an assessment with qualified staff.
(They can also advise on local instructors and companies that specialise in adapting cars)

Website: http://www.drivingmobility.org.uk

Contact: 08005593636

Email: info@drivingmobility.org.uk

Opening Hours: between 9:00 am and 5pm Mondays to Fridays

Address: The Forum of Mobility Centres, 2 Princes Street, Truro, TR1 2ES

Local Centre for the Northwest:

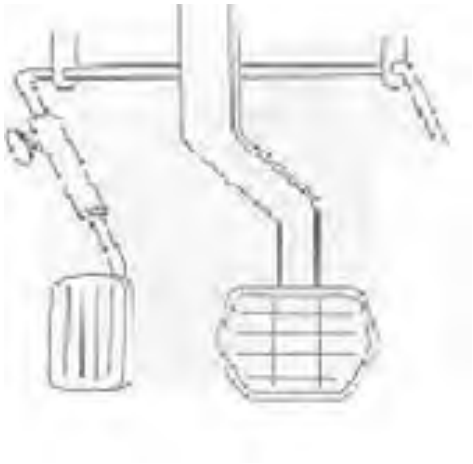
North West Driving Assessment Service
Fleet House
Pye Close
Haydock
Saint Helens
WA11 9SJ
Phone: 01942 483713

Email: mobility.centre@bridgewater.nhs.uk

The mobility centre can advise on many issues such as:

- Vehicle access
- Adaptations for getting in and out of a vehicle

- Wheelchair accessible vehicles
- Companies that are accredited to do vehicle conversions
- Driving adaptations
    - Primary Controls:- Accelerator and Brake Adaptions
        - Left foot accelerator



        - Accelerator Rings and Column Mounted Push Brakes
        - Combined Push Pull Accelerator Brake
        - Floor Mounted Push Pull Accelerator and Brake
        - Radial Action Accelerator and Combined Push Brake
        - Electronic Gas and Brake System
    - Primary Controls:- Steering

        - Steering Wheel Covers
        - Horizontal Steering System
        - Joystick Control System
    - Secondary Controls
        - Gear Selector and Handbrake Adaptations
        - Infra-Red Controls
        - Additional Mirrors
        - Pedal Guards
- Legal issues and advocacy
- Public transport
- Lots of other information such as
    - Drivers' clubs
    - Recommended instructors
    - Funding advice

All these things are outlined in detail on their website, please go and look there. If you do not have Internet access, then please ask for a handbook from the SMRC.

50. Useful Contacts for Charities for Adults

Website: **http://www.limbless-association.org/**

Office Opening Times
Monday to Friday – 9am to 5pm
Saturday, Sunday & Bank Holidays – Closed

Address
The Limbless Association
Unit 10
Waterhouse Business Centre
2 Cromar Way
Chelmsford
Essex CM1 2QE
Telephone numbers
Tel: 01245 216670, 01245 216671 or 01245 216672
Help line: 0800 644 0185
Limb Loss Legal Panel: 0800 644 0186

Email Addresses
For general enquiries please email
enquiries@limbless-association.org

Website: **http://www.limbpower.com**

Kiera Roche, CEO
Telephone:07502 276858 Email: kiera@limbpower.com
Address:
LimbPower, Whitecroft, Tandridge Lane, Lingfield, Surrey, RH7 6LL

Website: www.limbcare.org

CALL: Our support-line number is 0800 052 1174.

Opening hours are 9:00am - 5:00pm Monday to Friday.

Out of hours: Please leave a message with your contact details and our Support Officer will contact you as soon as possible.

EMAIL: info@limbcare.org

Head Office: Limbcare Ltd, Suite 3C, Westmead House, Westmead, Farnborough, Hampshire, GU14 7LP

51. Useful contacts for Veterans:

Address:
Blesma, The Limbless Veterans,
115 New London Road,
Chelmsford,
CM2 0QT T: 020 8590 1124
Email: info@blesma.org
Contact: Here to help. Mon - Fri, 9am - 5pm
020 8590 1124

Address
Help for Heroes
Unit 14 Parkers Close
Downton Business Centre
Salisbury
Wiltshire
SP5 3RB
Contact: North of England, Scotland and Northern Ireland - 01980 844238
Web address : www.helpforheroes.org.uk/about-us/contact-us

Text: 81212
Call: 08088021212
Email: https://support.veteransgateway.org.uk/app/ask
Website: https://support.veteransgateway.org.uk/app/ask

Address
Manchester Office
42 Canada Street
Manchester
M40 8AE
Email: info@wwtw.org.uk
Website: walkingwiththewounded.org.uk
Phone: 01263 863 900

52. Useful contacts for Charities for children

Website: www.reach.org.uk

Contact: 08451 306225 or 020 3478 0100

Office Hours: Monday – Friday 9:00 a.m. – 5:00 p.m.

Head office: Reach Charity Ltd, Pearl Assurance House, Brook Street, Tavistock, Devon, PL19 OBN

Email: http://reach.org.uk/about-reach/contact-us?view=form

Website: www.steps-charity.org.uk

Contact: 01925750271

General Notes

General Notes

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General Notes

Date of appointment	Who with?	Notes of appointment

Date of appointment	Who with?	Notes of appointment

Date of appointment	Who with?	Notes of appointment

Date of appointment	Who with?	Notes of appointment

Sources of further information:

www.lancsteachinghospitals.nhs.uk
www.nhsdirect.nhs.uk
www.patient.co.uk

Lancashire Teaching Hospitals NHS Foundation Trust is not responsible for the content of external internet sites.

Chinese

如果你需要帮助使能明白这些信息的内容，或者需要另一种的格式，请你提出这个要求。

English

Please ask if you would like help in understanding this information or need it in a different format

Gujarati

જો તમને આ માહિતી બીજી કોઈ ભાષામાં સમજવામાં મદદ જોઈતી હોય અથવા તે બીજા કોઈ સ્વરૂપમાં જોઈતી હોય, તો કૃપા કરીને કહો.

Russian

Скажите нам, если Вам необходимо объяснение этой информации или она нужна Вам в другом формате.

Polish

Na życzenie możemy zapewnić pomoc w zrozumieniu tych informacji lub udostępnić je w innym formacie.

Spanish

Por favor díganos si necesita ayuda para entender esta información o la necesita en un formato diferente.

Patient Satisfaction Survey Comments 2019

1	The staff at the Centre are always friendly and helpful.
2	I ask for appointment times in the morning 10.00am or 11.00am, as I can't come late afternoons, as my youngest son brings me in the car because sometimes I go wobbly walking.
3	Regarding waiting times; it has never been beyond a reasonable delay. I am happy to experience this, because it shows that each patient (myself included) is not being rushed or neglected in the treatment plan. An excellent Centre with remarkable staff. Thank you.
4	Friendly service – staff lovely.
5	The Centre genuinely provides the best level of service we have ever experienced in the NHS. Staff are friendly, polite, well informed and extremely hard working. It's a pleasure being in the Centre.
6	Also very satisfied with help from transport.
7	The person that I saw on my second appointment, which was on the 13th, was more informative that the person I saw at my first appointment, which was most helpful and reassuring. I am very satisfied with the shoes, which have been adapted for me and will be bringing another pair in for the same procedure.
8	Quite happy with you all.
9	It's a great service and facilities the best I have ever experienced. Everyone is really nice and puts you at ease straight away.
10	I've experienced no problems at my appointment. Low waiting time. The young lady I saw was lovely; her manner pleasant and polite and she ensured I understood all she was discussing.
11	Excellent – thanks.
12	All staff are very helpful and pleasant.
13	I have been visiting the SMRC for 10 years now and have received impeccable care. The staff are absolutely wonderful and nobody could ask for any better treatment. I am most grateful. Thank you.
14	Never had any delays or problems – staff have always been pleasant and helpful.
15	All I have to say is thank you to all the staff for everything you do for us all.
16	I am consistently well informed about my son's treatment. The staff at the Centre always act with dedication and professionalism, especially the Reception staff.
17	The Centre is perfect – no complaints.
18	Fantastic quality service X is excellent at his job and a great customer service person.
19	You provide a very good service; I see Mr X, who has always been very helpful. I have severe problems with my feet and I am glad of his help.
20	Very satisfied overall – great service to help people keep their mobility and independence.
21	I have had my share of extensive treatment at various hospitals. I am and have been proud and happy to have been well benefitted and belong to a super NHS and a very caring Mobility Unit.
22	I had gone to the Centre for my splint to be mended and it was felt that I needed to be fitted with a new one. I got an appointment quite rapidly. I felt this was brilliant service - identifying I needed something before a problem arose.

	Mobility is vital and this was both responsive and showed extreme skill. I would like to thank the service for keeping me moving. I was treated with kindness and respect at all times.
23	Brilliant staff there to help and explain things, so that it's easy to understand.
24	I understand the pressures and staff are lovely.