

## Specialist Mobility Rehabilitation Centre (S.M.R.C.)



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## PREFACE

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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 service in the Specialist Mobility Rehabilitation Centre.

There are many different reasons why people become patients at our Centre, some patients undergo amputations and others are born with congenital limb deficiencies.

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

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.**

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## 1. WHAT ARE PRE-OPERATIVE AND PRIMARY APPOINTMENTS?

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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 other 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.

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## 2. AM I ALONE?

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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. But 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 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. '**10. 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.

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## 3. WHAT OPERATION HAS BEEN PROPOSED AND WHAT DOES IT CONSIST OF?

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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.

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## 4. ARE THERE ANY ALTERNATIVES TO OPERATION THAT HAVE NOT BEEN CONSIDERED?

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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.

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## 5. WHAT ARE THE POSSIBLE COMPLICATIONS OF THE OPERATION?

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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 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 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 trickling of water 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 highly unreliable and variable.

There are many ways of dealing with phantom limb pain. In fact most patients experience it to one level or another. 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 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 Medication:** there are many forms of medication to alleviate phantom limb pain; the commonest ones are Pregabalin, Gabapentin and Amitriptyline. 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.

**5.3.2 Psychological Techniques:** These are covered in the area describing the work of the Counselling Psychologist that include hypnosis for phantom limb pain, EMDR for trauma that can arise from an amputation that 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.

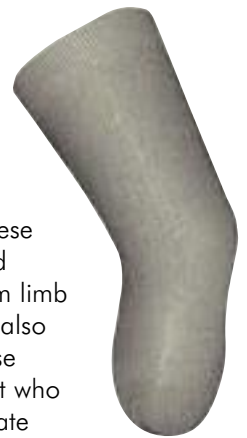
### 5.3.3 Neuroma Formation:

Neuroma Formation is swelling of the cut end of the nerve, which is still retained within the stump, grows a little portion at the end of the nerve. It is 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. 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. The treatment for these when they occur is surgical excision or prosthetic modification. 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 discuss whether you the patient would prefer to go down a surgical route which will require a short inpatient stay for this local benign (non cancerous, i.e. **this is not cancer**) growth to be removed or whether or not we shall try modifying your socket to relieve the pressure over this area. 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, one third are the same and 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. But we will discuss the plan in clinic.

### 5.3.4 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. There are also situations where none of the above work. In these situations you will be referred to a pain specialist who will look at various injection techniques to alleviate the pain.



### 5.4 Stump Pain:

Stump pain differs from phantom limb pain in the way that the pain is felt within the stump itself. Very often this is because of the discomfort felt at the end of the bones but also there can be some associated discomfort in the skin that can become very sensitive to touch. Very often the use of a stump-shrinking sock to provide constant compression will alleviate this discomfort. 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), this may require further surgical intervention. Sometimes this pain can be related to infection that we have covered above. When the skin is hypersensitive we sometimes use medicated plasters to

manage this pain, this I have found very successful.

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

**5.5 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 develop 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 area we found is the inability to straighten the joint, most commonly this occurs in the knee and the hip. Regrettably this is preventable in some situations.

**5.6 Stump jumping:** This is something that many patients describe and is related to sudden movements of the stump that are beyond their 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. 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 but sometimes there will be a need for specific management with some muscle relaxants such as diazepam in the same dose when it is prescribed for back pain due to muscle 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 a rough idea there is a small table below that gives a rough percentage increase in amount of oxygen and thus energy that is required to walk with an artificial leg.

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.

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

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 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.
- 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.



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## 7. PSYCHOLOGICAL HEALTH

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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 life style 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, 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 a counselling psychologist who will be experienced and very helpful.

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## 8. WHAT DO THEY LOOK LIKE?

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Below are pictures of some artificial limbs



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## 9. WHAT WILL I LOOK LIKE WITH AN ARTIFICIAL LIMB ON?

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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 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 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.

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## 11. WHY IS THERE A FULL EXAMINATION WHEN I AM JUST COMING FOR AN ARTIFICIAL LIMB TO BE FITTED?

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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

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## 12. DO YOU WANT TO MEET WITH AN AMPUTEE TO DISCUSS WHAT IT IS LIKE BEING AN AMPUTEE?

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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 CRB check these patients.)

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## 13. HOW DO YOU LOOK AFTER YOUR STUMP AFTER THE AMPUTATION SCAR HAS HEALED?

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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)

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## 14. WHAT ARE THE COMMON PROBLEMS THAT CAN OCCUR WITH MY STUMP AND WHAT CAN BE DONE ABOUT THEM?

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**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.

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## 15. WHAT SHOULD I DO WITH ALL MY SHOES AND WHAT CLOTHES SHOULD I WEAR?

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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

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## 16. WHAT CLOTHES SHOULD YOU WEAR?

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(Pictured: Patient doing balancing exercises)

Well this depends what your coming for and what level your amputation is.

If you are coming for an examination of your stump then a lot of patients like to wear cloths that retain dignity. Shorts for both man and woman 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.

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## 17. WHAT WILL MY STUMP LOOK LIKE AFTER THE OPERATION, HOW WILL IT CHANGE AND WHAT CAN WE DO TO ASSIST THIS?

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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 oposite.

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.



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## 18. WHAT AND WHERE IS THE SPECIALIST MOBILITY REHABILITATION CENTRE?

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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 opposite 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.



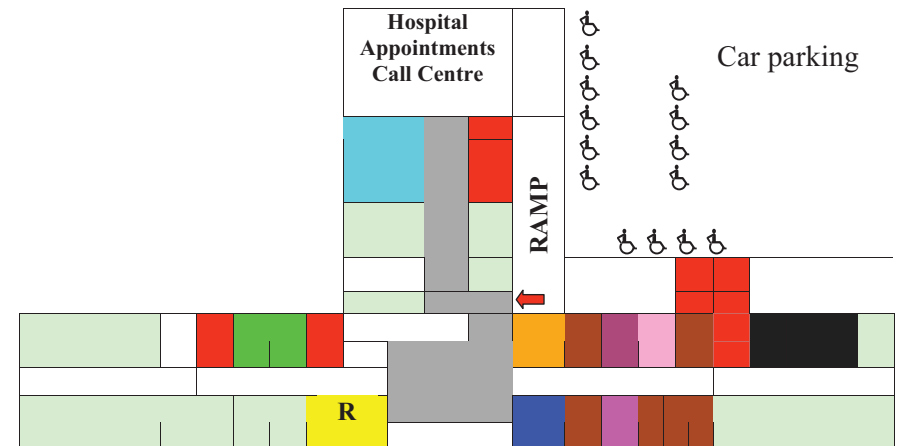
Directions to Watling Street Road and Sharoe Green Lane from the north bound M6.

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.



**SMRC Layout**

Red	Toilets	Blue	Medical room	Purple	Physiotherapy
Green	Orthotics Assessment Room	Brown	Fitting room	Light Green	Admin/workshop
Yellow	Reception <b>R</b>	Pink	Psychology	Black	Wheelchair assessment
Orange	Upper limb Fitting room	Light Purple	Gym	Light Blue	<b>Restaurant</b>

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.

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, 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 the information technology services (computers) and the restaurant.

The restaurant is open from 9am to 11am for breakfast, 12pm-1.45pm for lunch and 1.45pm-3.30pm for cold snacks and drinks. 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.

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## 20. WHO CAN COME TO MY APPOINTMENTS WITH ME AND WHAT ELSE SHOULD I BRING?

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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 then 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.

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## 21. THE 'DOS AND DON'TS' OF PROSTHETIC USE

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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 dos

- 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
  - o Hitting things
  - o Door stop
  - o Flower pot
- Do not throw away, even if the bits have to be replaced in another country, we can still reclaim if still in warranty!!

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## 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?

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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.

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

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.

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### 23. WHAT ELSE CAN I GET HELP WITH AT THE CENTRE?

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There are a few things that are worth discussing when you get here, some might be useful for you, others may be not

- Advice on benefits, please arrange an appointment with Sister Lynn Kacperek, here's a useful web address
  - o <http://www.direct.gov.uk/en/DisabledPeople/index.htm>
- Advice on driving and motability, there is a handbook available at the Centre and we will discuss instructors and referral to the Wrightington Mobility Centre
  - o <http://www.wigan.gov.uk/Services/CommunityLiving/CommunityGroups/WrightingtonMobilityCentre.htm>
- If you are on the higher rate of the mobility component of Disability Living Allowance, War Pensioners Mobility supplement or you have an invalid carriage you may be entitled to a free tax disc
  - o [http://www.direct.gov.uk/en/DisabledPeople/MotoringAndTransport/Yourvehicleandlicence/DG\\_10028003](http://www.direct.gov.uk/en/DisabledPeople/MotoringAndTransport/Yourvehicleandlicence/DG_10028003)
- Psychology services

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### 24. WHO ELSE MAY BE IN THE CENTRE WHEN I GET THERE?

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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.

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### 25. IS THERE ANY PARKING?

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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.



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### 26. HOW MANY ARTIFICIAL LIMBS CAN I HAVE?

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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 use 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.



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## 27. HOW DO I GET ABOUT AFTER MY OPERATION?

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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.



### The Team members at the Specialist Mobility Rehabilitation Centre

The Rehabilitation Sister	The Rehabilitation Engineer
The Rehabilitation Physician	The Counselling Psychologist
The Specialist Physiotherapist	The Fitness Instructor
The Specialist Occupational Therapist	The Orthotist
The Prosthetist	The Health Care Assistant

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## 28. THE REHABILITATION SISTER

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The Rehabilitation Sister will be one of two highly trained nurses who have many years of experience treating amputees. Under an expansion of the role they may be the first person you meet from our Centre and may well have given you this booklet. They travel weekly to each of the four main hospitals that the SMRC covers: Blackburn, Blackpool, Lancaster and Preston.

These hospitals are where almost all the amputations are carried out in this region.

The Rehabilitation Sister will examine you and quite likely your wound too. They will discuss their findings with the treating team.

On their return to the unit your case will be discussed.

If you have any questions please ask the nurses, if they cannot answer they will ask you to write them down and bring the list to the primary appointment.

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## 29. THE REHABILITATION PHYSICIAN

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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)

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## 30. THE SPECIALIST PHYSIOTHERAPIST & PHYSIOTHERAPY ASSISTANT

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**(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.









Stretching and strength building exercises

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.

**30.1 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 stabilising 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	Removed 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.

**30.2 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 outpatients physio and should not be tried with out 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.

### 30.3 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 such as the Nintendo Wii Fit and X-box 360.

### 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.

### 30.4 '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



### 30.5 Femurette

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

### 30.6 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.

### 30.7 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

#### 30.7.1 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 is 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.

#### 30.7.2 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.

### 30.7.3 Getting up from the floor or from a fall with the use of a 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.

### 30.7.4 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.

### 30.8 Walking up/down ramps and/or stairs Downwards on ramps (small steps)

1. Place walking aid down onto ramp.
2. Step down with artificial limb first.
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

Stand close to the stairs. Hold onto the handrail with one hand and place the stick in the other hand.

First take a step up with your healthy leg.

Then take a step up with your artificial limb.

Then bring your stick up on the step.

Always go one step at a time.

### Walking down stairs

Stand close to the stairs. Hold onto the handrail with one hand and place the stick in the other hand.

First put your stick one step down.

Then take a step with your artificial limb.

Then take a step down with your healthy leg, onto the same step as your artificial limb.

Always go one step at a time.

### 30.9 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.

## 31. 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 lay out 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.

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## **32. THE PROSTHETIST**

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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.

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## **33. THE TECHNICIAN**

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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.

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### 34. THE COUNSELLING PSYCHOLOGIST

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The counselling psychologist is a very experienced member of the team who is qualified as a counsellor.

Many patients find it difficult to adjust to being an amputee and the counselling psychologist will help them by talking and using counselling and psychological techniques to help the patients following amputations.

The counselling psychologist is also skilled in teaching self-hypnosis for the management of phantom limb pain; this has been proven to reduce phantom limb pain by over 50%.

Sometimes patients undergo an amputation for traumatic reasons such as a road traffic accident. The counselling psychologist will be able to use a technique called eye movement desensitisation and reprocessing to help, this has been shown to aid recovery and rehabilitation.

Please see 5.3.2.1

5.3.2.2

7

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### 35. THE FITNESS INSTRUCTOR

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From August 2011 the SMRC will be developing a small gym for use by amputees. 2 members of staff are being certified as fitness instructors, they both have a background in either physiotherapy or sports science and engage in other coaching activities.

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 ones 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!!

Currently we are carrying out an audit of 100 patients to assess what activities we should be offering such as spinning (cycling), aerobics, Pilates and weight classes, and we will be publishing a full list of available activities in September/October.

The classes will be aimed at all ages and levels of fitness.

If you have any specific thoughts then please contact us.

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### 36. THE ORTHOTIST

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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 custom shoe that will protect your foot, this is very important as lack of attention can lead to a further amputation.

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### 37. THE HEALTH CARE ASSISTANT

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The Health care assistant is a member of the medical team that will look after you whilst you are in the unit. Their role is varied but always helpful. They ensure that the clinics run smoothly, patients are safely managed, swabs and tests sent off, stocks checked and restocked, that patients can get drinks and food while they are waiting (if they cannot get to the restaurant themselves) and a host of other duties that are essential to the unit.

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### THE ARTIFICIAL LIMB

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



### 38. 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.

#### 38.1 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 knee cap) P.

#### In above knee patients

Beneath the ischial tuberosity (or bottom bone) BB



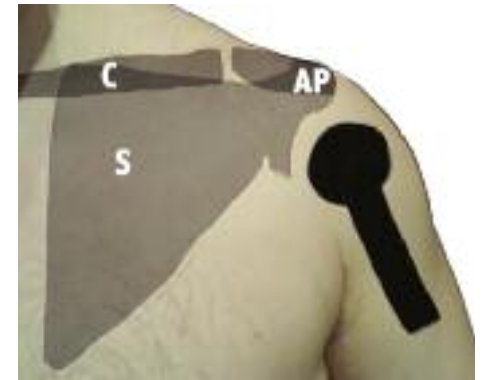
#### In above elbow amputations

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.

#### 38.2 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.





### 38.3 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.

### 38.4 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.



### 38.5 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.

Length of the limb 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.

A patient who has had both legs amputated, then 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 components 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.

### 38.6 Delivery appointment

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

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## 39. TYPES OF KNEE JOINT

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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.

### 39.1 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.



### 39.2 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

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## 40. THE FOOT AND ANKLE UNIT

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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.

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## 41. THE HIP JOINT

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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.

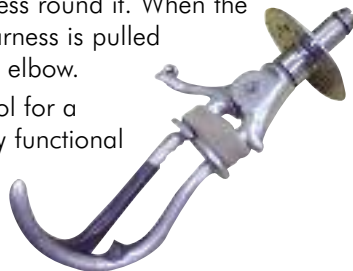
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## 42. PROSTHETICS FOR THE ARM

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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.



### 43. HOW ELSE ARE PATIENTS SUPPORTED?

- The wheelchair and prosthetic user group is a group that meets with key members of staff to discuss changes in the way the service is run. This is a formal meeting.
- 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



### 44. MY CONTACT DETAILS

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#### Sources of further information:

[www.lancsteachinghospitals.nhs.uk](http://www.lancsteachinghospitals.nhs.uk)

[www.nhsdirect.nhs.uk](http://www.nhsdirect.nhs.uk)

[www.patient.co.uk](http://www.patient.co.uk)

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