

Post-Earthquake Spinal Cord Injury Rehabilitation Response

# Promoting Independence Following a Spinal Cord Injury

A Manual for the Education of Patients,  
Their Families and the Community



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Health Cluster Coordination



Ministry of Health



World Health Organization



UNCIEF



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## **Abstract**

This manual provides basic knowledge about the spinal cord injury to patients, their family and the community. It shows how people with spinal cord injury can learn to do things themselves.

This Manual gives information on how to assist someone who has a spinal cord injury and suggests when to ask for help from a therapist or a doctor.

It includes information on what a spinal cord injury is and the emotional and physical effects of this type of injury. It shows how to identify the different levels of injury and covers the basic care of a person following a spinal cord injury.

Suggestions are given on how to promote independence in all aspects of a person's daily life. This includes managing bladder and bowel, preventing pressure sores, exercising, sitting, transferring, washing, dressing, standing and walking.. Simple adaptations to make it easier to use a wheelchair around the home and compound are described. Finally and perhaps most importantly, ideas are given about how a people with spinal cord injuries can remain active and involved in their communities.

## Preface

The massive earthquake that struck Pakistan on 8 October 2005 destroyed 85% of the total infrastructure, killing 73,000 people and injuring an unknown number of people. Among the 150,000 injured that were treated in Public health facilities, more than 713 amputations and 730 Spinal Cord Injuries were registered approximately. The Ministry of Health and other international and national partners have successfully addressed the immediate surgical and medical care needs for this disadvantaged population. However, in the medium and long term perspectives, the rehabilitation of this disabled population will pose a huge additional burden to the large list of health system rehabilitation and reconstruction in the earthquake affected areas.


Spinal cord Injuries require specific care and specific equipment. In their early joint response, Pakistan's Ministry of Health supported by WHO and UNICEF had to rapidly respond to the arising needs for physical therapists, ripple mattresses, wheelchairs, and building of two facilities that provide extra 200 beds for the care of these disabled patients. As part of this immediate action, special training manuals were developed, one for the education and training of the patient their families and the community, and another for the health staff to acquire the necessary skills for treating and caring for spinal cord patients.

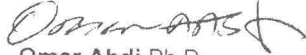
This specific manual 'Promoting Independence Following a Spinal Cord Injury' is the result of the efficient collaboration between the Ministry of Health of Pakistan and WHO. The manual is a user-friendly, easily-readable and beautifully laid-out document that serves the purpose to teach health staff, patients and their family members in a short, simple and reliable way.

More importantly, these trainings on rehabilitation are holistic in their approach, as they teach patients and their families how to live with their physical limitations and how to increase their independence from others by increasing their capacities. This training is holistic in its approach, where in addition to health facility and community based rehabilitation activities, the programme will establish links with the existing district, provincial and national level services and promote the full social inclusion of the disabled. This training initiative will also fully respond to the rehabilitation and social integration needs of this disadvantaged population.

The preparation of this training manual and the launching of a multifaceted broad based national rehabilitation programme is an integral part of the many partnerships that the Ministry of Health has spearheaded successfully in the post earthquake period to which UNICEF and WHO along with other national and international partners have played key roles in their implementation. This initiative is a living example where the risks and challenges posed by this devastating earthquake are being turned into care and development opportunities.

  
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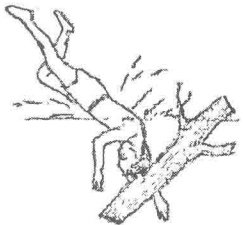
# 1. Introduction

For people who have experienced a spinal cord injury, rehabilitation provides the opportunity for regaining skills, tools and outlook to return to living independently. The goal of the Spinal Cord Injury Rehabilitation is to improve function and independence, helping each person make the adjustments and adaptations physically and emotionally necessary to gain control of his/her life again. Having a spinal cord injury doesn't mean that the person have to stop participating in different activities of life. After an accident or illness, returning to home in optimal physical condition is of primary importance.

The goals set by spinal injured patient may be independence in ambulation whether it is walking with a cane, or using a wheelchair. Or the goal may be to relearn the abilities of daily living such as self care, grooming, cooking, or even returning to work or school. What ever the goal and capabilities may be, this manual will provide them with every opportunity for achieving the highest potential in their life.

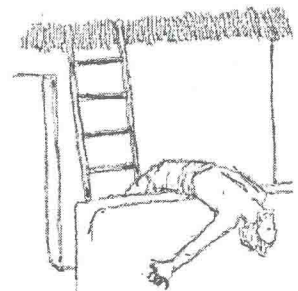
## 1.1 What is a Spinal Cord Injury?

A spinal cord injury occurs when the spinal cord is damaged. Most spinal cord injuries are a result of accidents which break the bones of the neck or the back. When the bones of the neck or the back are broken they may damage the spinal cord. This is because the spinal cord lies in a tunnel made by these bones. Thus usually paralyses the muscles and causes loss of feeling below the level of injury.



Motor vehicle accidents are a common cause of spinal cord injury. Other causes of spinal cord injuries include falling from a bicycle or other type of transport; diving into shallow water or hitting head on a submerged rock or tree; and falling from a height or buried under rubble due to earthquake.

People may also have a spinal cord injury as a result of violence. They might be stabbed, shot or blasted. All of these may damage the spinal cord. The spinal cord may also be damaged by disease or infections such as tuberculosis.



## Where is the Spinal Cord?

Spinal cord starts at the bottom of the brain and ends at the lower back. It lies in a tunnel made by a group of bones which sits one on top of each other. These bones are called vertebrae and column of vertebrae is known as backbone.

## **1.2 What Happens when the Spinal Cord is Injured?**

When the spinal cord is injured messages about what the body is feeling, below the damaged area, cannot get to the brain. Also information from the brain cannot get past the damaged part of the spinal cord to tell the muscles how to move. Feeling and movement of the body below the damaged part are affected. The person will also be unable to or find it difficult to control his bladder and bowel.

If the person has no feeling or voluntary movement below the damaged part, the spinal cord injury is said to be complete. If the person has some feeling or voluntary movement below the damaged part, the spinal cord injury is said to be incomplete.

How a spinal cord injury affects a person will depend on the level of injury and whether the injury is complete or incomplete. It will also depend on many other factors such as the person's age, gender, cultural background, personality, physical build, religious beliefs, social and educational background, marital status and financial position.

### **Will the spinal cord recover after it is injured?**

Once the spinal cord has been injured it cannot be repaired and it will not regrow. There may be some improvement as the spinal cord recovers from spinal shock. Spinal shock occurs immediately after every spinal cord injury. This spinal cord stop working and the person will be unable to move. Spinal shock may last for a few hours but could last upto six weeks. During the period of spinal shock it is difficult to know how badly the spinal cord is damaged.

If the person has no feeling or voluntary movement below the damaged part, the spinal cord injury is said to be complete. If the person has some feeling or voluntary movement below the damaged area, the spinal cord injury is said to be incomplete

There may be some improvement when any swelling, bruising or bleeding of spinal cord goes away. Any recovery will usually happen within 6 months following a spinal cord injury. People with an incomplete spinal cord injury may show some improvement for upto 2 years following an injury.

If the spinal cord is damaged as a result of infection or tumor it is possible that it will completely recover.

What can be done after a person has spinal cord injury

### 1.3 Levels of Spinal Cord Injury

Damage to the spinal cord in the neck will cause some loss of arm movement and complete loss of trunk and leg movement. The person will have difficulty in breathing and coughing. This is called **tetraplegia**.



If the person has tetraplegia he will have some feeling in his face, neck, shoulders, arms and hands. He will have no feeling in his trunk and legs.

Damage to the spinal cord in the upper part of the back will cause some loss of trunk movement, complete loss of leg movement and some difficulty with coughing. This is called **high paraplegia**.

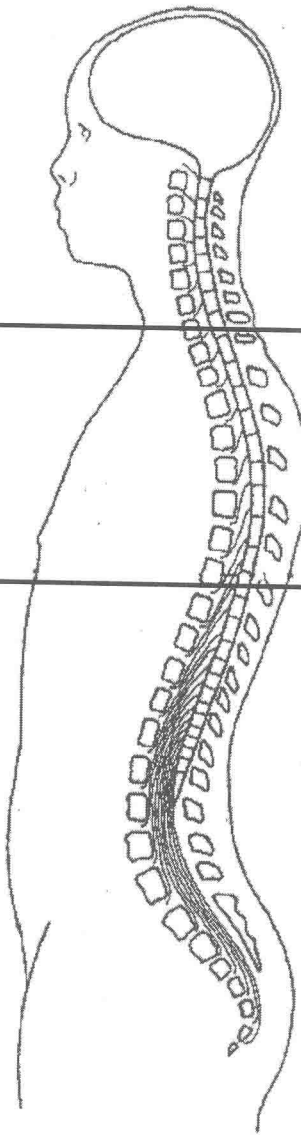


If the person has high paraplegia he will have some feeling from his chest upwards. He will have no feeling in his abdomen and legs.

Damage to the spinal cord in the lower part of the back will cause complete or partial loss of leg movement. This is called **low paraplegia**.



If the person has low paraplegia he will have some feeling from his abdomen upwards. He will have partial feeling in his legs.


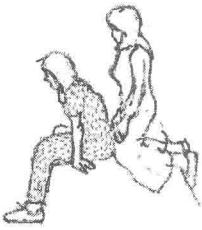




Whatever the level of spinal cord injury the person will have some difficulty controlling his bladder and bowel.


## 1.4 Grades of Spinal Cord Injury

The grade of sitting balance achieved is a good indication of what each person will be able to after rehabilitation. People with a spinal cord injury will reach one of six grades of sitting balance. The grade reached will depend upon many factors such as the level of injury, other injuries, age, gender, physical build, motivation, and environment. It will also depend upon the person making the decision to get on with life despite the spinal cord injury. Good support and an encouraging attitude of the person's family, friends and health workers are essential. The activities in this manual will be separated into the six grades of sitting balance to provide guidance on what people with a spinal cord injury can achieve.

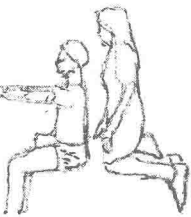
### Grades One to Four are different grades of tetraplegia

 <p><b>Grade One</b></p> <ul style="list-style-type: none"> <li>. He cannot sit without support.</li> <li>. The helper must support him at all times.</li> </ul>	 <p><b>Grade Two</b></p> <ul style="list-style-type: none"> <li>. She sits by supporting herself using both arms with her elbows locked.</li> <li>. She is unable to lift her arms and balance.</li> <li>. The helper must stay by her at all times.</li> </ul>	 <p><b>Grade Three</b></p> <ul style="list-style-type: none"> <li>. He is able to lift one arm up below his shoulder level.</li> <li>. He supports himself on his other arm with his elbow locked.</li> <li>. The helper must stay by him at all times.</li> </ul>	 <p><b>Grade Four</b></p> <ul style="list-style-type: none"> <li>. She is able to lift one arm above her head.</li> <li>. She can bend and straightens it in this position.</li> <li>. She supports herself on her other arm without locking her elbow.</li> <li>. She is able to sit without supporting herself with her arms.</li> <li>. She will need a helper in the beginning or when she tries to do things in this position.</li> </ul>
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### Grade Six is the same as low paraplegia

 <p><b>Grade Six</b></p> <ul style="list-style-type: none"> <li>. She can sit without support.</li> <li>. She can throw and catch a ball above her head.</li> <li>. She does not need a helper</li> </ul>
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### Grade Five is the same as high paraplegia.

 <p><b>Grade Five</b></p> <ul style="list-style-type: none"> <li>. He can sit without support.</li> <li>. She can sit without support.</li> <li>. He can lift both his arms up at the same time in all directions.</li> <li>. He will need a helper in the beginning when he tries to do things in this position</li> </ul>
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## **1.5 What can be Done after a Person has a Spinal Cord Injury?**

Immediately after the injury, the person must be taken to hospital. She will probably stay in hospital for several months. While she is in bed she must start to do some exercises to keep the muscles which are not paralysed strong. She must also begin to learn how to manage her bladder and bowel. She must learn about relieving pressure so that she will not develop pressure sores. She must get in the habit of eating healthy food and drinking about three litres of water a day. If she can do some things for herself like eating and washing then she should be encouraged to do them.

While she is in bed waiting for her backbone to mend she must not twist or turn her body until the doctor says it is safe to do so. Once the backbone is stable she will be allowed to sit up in a wheelchair. It may take from a few weeks to a few months before she is ready to sit in a wheelchair.

When she is sitting in a wheelchair, she must then start to learn ways in which she can become independent. She must learn how to move around in a wheelchair. She must continue exercising to keep her muscles strong. She will develop routines for relieving pressure to prevent sores. She must become competent at managing her bowel and bladder. She must learn how to wash, dress and feed herself.

She should also begin to learn how to do things around the house and compound and find ways to do paid work and to become involved in her community. Children must return to school. By looking at things she can do and by staying active she will learn to cope with her spinal cord injury.

It is important that her family and friends accept her, encourage her to do things by and for herself, respect what she wants to do and include her in what is happening.

## 2. Basic Care after a Spinal Cord Injury

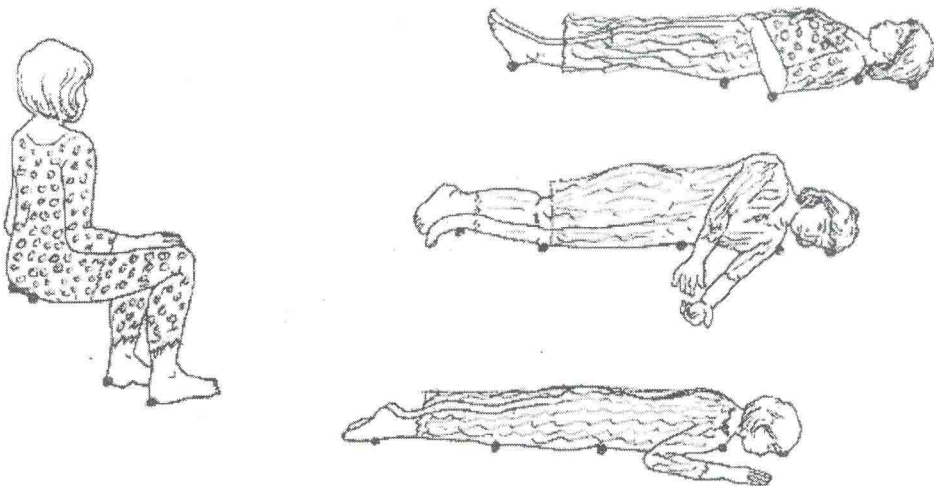
### 2.1 Preventing Pressure Sores

What is a pressure sore?

A pressure sore is an area of damaged skin and flesh. A pressure sore is usually caused by sitting or lying in the same position for too long without moving. Normally when we sit or lie in the same position for a long time, we begin to feel uncomfortable. We move or shuffle about to change our position. People who have a spinal cord injury may not be able to feel when they are uncomfortable. They will not feel that they have been in one position for too long so may not change their position.

A pressure sore can develop in only a few hours. It usually starts with the skin changing colour. The skin may appear slightly darker than usual. If the sore is not treated quickly, it may develop into an open blister within a few days. Over a longer period of time it will become a deep hole in the flesh. If a pressure sore develops it may take months to heal. It may even require surgery. If it becomes infected and is poorly treated it can kill.

Pressure sores develop on the parts of the body which take the person's weight and where the bones can be easily felt under the skin. The areas most at risk depend on whether the person is sitting or lying on the back, front or side:



#### How to recognize a pressure sore

When the pressure on an area of skin is removed or relieved the skin in that area will become darker. The darkness should normally fade within two to three minutes.

If the darkness lasts for more than five minutes it may be a sign that the pressure had been too much or had been for too long. The dark area of skin may feel warm to touch. During this stage, a pressure sore can be stopped from developing by completely removing all the pressure from the dark area of skin. This will give the skin time to recover. No pressure should be put on that area of skin until the skin looks normal.

If the pressure is not removed until the dark area of skin disappears then a blister may form over this area. The skin will break down and cause a hole or ulcer to develop. Finally the flesh and perhaps the bone underneath the skin will become infected. If a pressure sore becomes infected and is not treated properly then the person will die. If a pressure sore has become a hole or ulcer he will need to see a doctor and may need to stay in hospital.

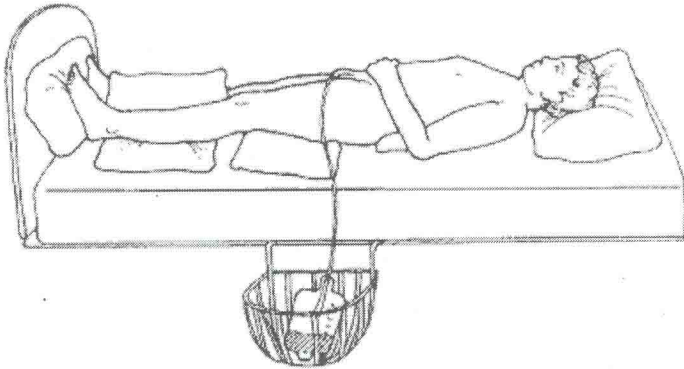
### **How to prevent a pressure sore**

The best way to avoid a pressure sore is to move frequently. The person should not lie or sit in the same position for too long. Relieving pressure is the most effective way of preventing sores.

**If the person cannot do this himself, someone else must help him.**

### **Relieving pressure when in bed**

When the person is lying down he must change his position between lying on either side, to lying on his back, to lying on his front every two to four hours. The mattress must be firm but not hard. A thick sponge foam mattress is ideal. The mattress must offer support to his body. The mattress must not be too soft so that his body touches the base of the bed underneath the mattress.



In the early months after a spinal cord injury pillows, pads or folded towels and blankets must be placed underneath him to protect the bony areas of his body. These must be placed so that the bony parts are between the pillows, pads or towels. This will reduce the risk of pressure sores.

**He must not lie on his front until his backbone is mended**

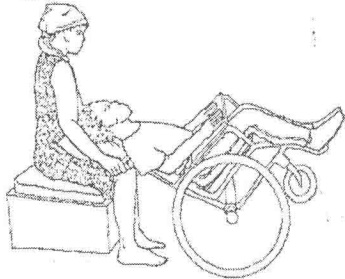
Always use clean sheets which have no big wrinkles in them. A big wrinkle may cause a pressure sore. If the sheets become wet or dirty change them immediately. Lying on wet or dirty sheets will cause a pressure sore.

### Relieving pressure when sitting in a chair

All people with a spinal cord injury must sit on a firm cushion. This will help to prevent pressure sores. Sitting directly on the canvas or hard wooden or metal seat of the wheelchair will cause a pressure sore. Different cushions suit different people. Try a variety of cushions. He should try each cushion for at least one day but preferably longer. If the cushion causes red marks then try another one.

### Pressure relief techniques in the wheelchair

As well as sitting on a good cushion the person must relieve pressure when sitting on a wheelchair by doing one of the following. The wheelchair brakes must always be put on before relieving pressure.



Tilt the wheelchair backwards. This is a good way to relieve pressure for those who need help.

Bend forwards with her arms hanging down. This is the most effective way to relieve Pressure sitting in a wheelchair.



Lean to one side and then to the other side.

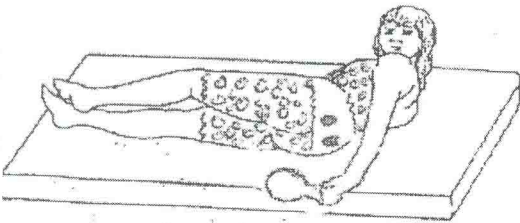
Lift her buttocks off the cushion by pushing up on the armrests or the back tyres.

Whichever method of relieving pressure is chosen it must be done for at least one minute. In the first few months of sitting in a wheelchair pressure must be relieved every 20 to 30 minutes. As the person becomes more active and if there is no sign of a pressure sore, she can relieve pressure less frequently.

### **Never sit for more than one hour without relieving pressure**

#### **How to check if a pressure sore is developing**

The skin must be checked twice a day. The skin must be checked once before getting out of bed. The skin must be checked once in the evening before going to sleep. A mirror should be used to check the parts of the body which are difficult to see. If she cannot check her skin herself she must ask someone else to check it for her.



If an area shows a sign of a pressure sore developing then she must not put any pressure on the affected area. She must keep the pressure off the affected area until the dark area has disappeared.

#### **Other precautions to prevent pressure sores**

- She must sit in the wheelchair correctly
- She must wash the body carefully everyday
- She must dry the body by gently patting the paralysed parts with a towel
- She must change wet or dirty clothes immediately.
- She must eat healthy food and avoid becoming too fat or too thin
- She must wear loose fitting clothes
- She must wear shoes or slippers when in the wheelchair to protect the feet from being knocked.
- She must be careful no to burn herself around fires and stoves and when carrying hot drink or food.
- She should not use talcum powder because it soaks up the skin's natural oils and dries the skin.
- She should not knock, bump or drop paralysed arms and legs, especially when transferring on and off the wheelchair.
- She should not lie or sit on wrinkled linen or bedclothes.

## 2.2 Learning to Urinate

When the bladder is full of urine a message is sent to the spinal cord and then to the brain to say you need to urinate. Sometimes when it is not convenient, like when you are on a bus, the brain will stop the bladder from emptying. When it is more convenient the brain tells the bladder to empty the urine.

### What happens to the bladder after a spinal cord injury?

The bladder is the part of the body which holds urine and it lies within the pelvis. A person with a spinal cord injury will not feel when she needs to urinate. She must learn a different way to urinate. If she does not learn a way to manage urinating, she will continually wet herself. This will be embarrassing and may cause a pressure sore. If she does not learn how to empty her bladder completely she will get a urinary tract infection. If she develops an infection she may become very sick and have a high fever. She needs to see a doctor as soon as possible for treatment.

After a spinal cord injury the person will have one of two types of bladders.

- A bladder that spasms
- A floppy bladder

### How to empty the bladder

During the period of spinal shock, while she is in hospital, a Foley catheter is kept in her bladder all the time. This catheter empties the urine from her bladder. After a few weeks the "Foley catheter" will be removed and one of the following methods should be tried. For any of the following methods to work she must stick to a regular routine of emptying her bladder. She should empty her bladder every three to four hours. When sleeping she may want to go six to eight hours without emptying her bladder. She will need to stop drinking a few hours before going to sleep.

#### 1. Tapping and gentle pressing (for both men and women)

<p>A bladder which spasms can be emptied by:</p> <ul style="list-style-type: none"><li>. Tapping gently on the lower part of the abdomen where the bladder is and then applying gentle pressure on the bladder with the heel of the hand or a flat hand (not a fist) to help empty the bladder.</li><li>. Repeat this several times until no more urine comes out.</li><li>. Tap and gently press the bladder either in bed or in a wheelchair or on the toilet.</li><li>. This may be used by men who wear a urinal sheath or men and women who empty their bladder on the toilet or commode.</li></ul>	<p>A floppy bladder can be emptied by:</p> <ul style="list-style-type: none"><li>. Pressing on it with the heel of the hand or a flat hand while leaning forwards and tightening the abdomen muscles to help empty the bladder.</li><li>. Tapping is not necessary as there is no reflex.</li><li>. This may be used by men and women who empty their bladder on the toilet or commode.</li></ul>
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**Hard pressure when tapping or pressing the bladder may push the urine upwards towards the kidneys. This may cause a urinary tract infection.**

A man who taps and presses his bladder may wear a condom sheath on his penis which is attached to a catheter tube and a plastic bag. When the bladder is tapped and pressed the urine runs into the condom sheath, down the tube and into the bag. The condom sheath must be removed once a day and the penis washed and dried. The bag must be emptied regularly so it does not become too full.

A woman is not able to wear a condom catheter. If she needs to protect herself from wetting her clothes in-between tapping and pressing her bladder every three to four hours she must wear disposable padding in her pants. If she has frequent body spasms she may pass a lot of urine into the padding. If she does urinate a lot even after tapping and pressing her bladder she should try another method. Pads must be changed regularly. She must not keep a wet pad in her pants as this will cause an infection. The pad must be carefully placed to prevent a pressure sore from developing.

## 2. Inserting a "standard catheter" every 3 to 4 hours (for both men and women)

If he is not able to urinate well enough by tapping and gently pressing, a "standard catheter" can be inserted into his bladder every three to four hours. This is called intermittent catheterisation. The catheter may be inserted while in bed or while sitting on a wheelchair or toilet.

A doctor or nurse must show him how to insert the catheter correctly to make sure his bladder will empty completely. This method is only suitable if he can do it without help; if there is a regular supply of standard catheters, if it can be done every three to four hours. To reduce the risk of infection he must wash his hands and genitals before inserting the catheter. The same catheter may be re-used for two to three weeks if it is **properly rinsed after each procedure**. Store the catheter in a clean and dry place.

## 3. Using an indwelling catheter (for both men and women)

A catheter which stays in the bladder all the time is called an indwelling catheter. The type of catheter which is used for this is called a Foley catheter. It is either inserted into the bladder through the genitals or through a small hole in the lower abdomen. Because the "Foley catheter" is left in the bladder all the time it continually empties the urine from the bladder.

The "Foley catheter" is connected to a tube which is connected to a plastic bag. The bag needs to be emptied regularly so that it does not become too full. The bag must always be placed lower than the catheter so that the urine drains out of the bladder. An indwelling catheter can cause infection, bladder stones or a sore on the underside of the penis.

It must be changed once every four weeks. A new catheter should be inserted. A doctor or a nurse must show the person how to do this. A supply of catheters must be available.



### **To prevent an infection a person must**

Drink three litres of water a day.  
Empty his bladder every three to four hours and stick to a routine.  
Wash his genitals at least once a day.  
Wash his hands before touching genitals or catheter.  
Keep the catheter and other equipment clean.  
Wash out the collection bag once a day with soap and water. Never pull or stretch the catheter.  
Never lift the collection bag above the bladder because the urine will flow back into the bladder.  
Check regularly that the bladder is emptying and that the catheter is not kinked.

### **Signs of an infection**

He feels unwell with fever and pain.  
His urine is cloudy or pink in colour and smells.  
He has difficulty urinating or urinates unusually small amounts.  
His spasms become stronger and more frequent.

### **Treating a bladder infection**

- . He must see a doctor immediately who will prescribe drugs to treat the infection.
- . He must drink more water to clean out bladder.
- . He must empty his bladder more frequently until the infection has cleared.

## **2.3 Learning to Defecate**

### **What is the bowel?**

The bowel is the part of the body which stores faeces. The bowel lies behind the bladder. When the bowel is full a message is sent to the spinal cord and then to the brain to say you need to defecate. Sometimes when it is not convenient, like when you are on a bus, the brain will stop the bowel from emptying. When it is more convenient the brain tells the bowel to empty the faeces.

### **What happens to the bowel after a spinal cord injury?**

A person who has a spinal cord injury may not feel when she needs to defecate. She must learn a different way to defecate. If she does not learn a way to manage defecating, she will continually dirty her pants. This will be embarrassing. Sitting or lying in faeces will also cause pressure sores and may cause bladder infections.

### **How to empty the bowel**

To empty the bowel the person must stick to a routine that works. Some people will defecate every day. However because it takes a little time, most people will be able to defecate every second day. Whether the person defecates every day or every second day she must do it at the same time each day.

It will take a few days or sometimes a few weeks before she will learn to control when to defecate. To help her to defecate she must eat healthy food and drink three litres of water a day. After a spinal cord injury the person will have one of two types of bowel:

### **When to defecate?**



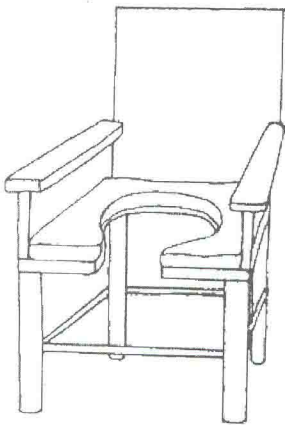
It is best to defecate before washing because the buttocks and hands will need to be washed afterwards. Some people find it easier to wash in the morning and some find it easier to wash later in the day or during the evening. Some people will need to take a mild laxative about 12 hours before defecating. The laxative helps the faeces move into the bowel. The laxative will also make the faeces soft and easier to push out or remove. A doctor will recommend a mild laxative.

Eating a high fibre diet and drinking three litres of water a day will reduce the need for a mild laxative. A high fibre diet and lots of water will also help the faeces to move into the bowel and make it soft. Some people may find it easier to defecate after eating some food or having a hot drink.

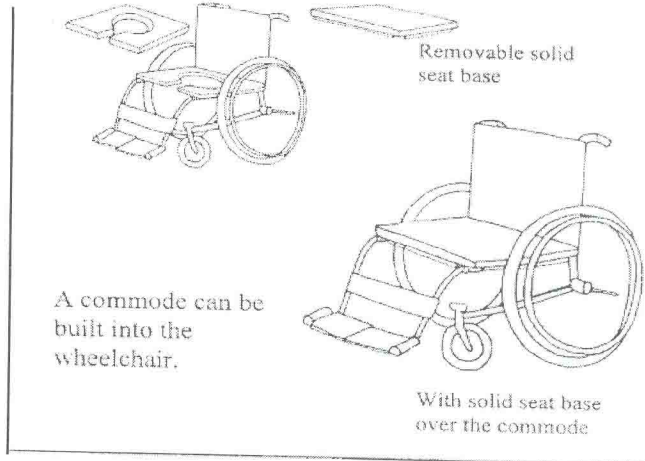
### Where to defecate?

He can sit on a toilet or a commode

A commode can be made from a wooden chair



Cushion for commode seat



### 2.4 Coughing

All people with tetraplegia and some people with high paraplegia will have difficulty coughing. This is because the muscles that help to cough are paralysed. Coughing is important. Coughing keeps the lungs clear of phlegm. Phlegm is a fluid which is made in the lungs. People who have difficulty coughing cannot remove phlegm and may get a chest infection. If any phlegm that is coughed up is yellow or green it is a sign of a chest infection. The person must see a doctor for treatment.

### Keeping the lungs clear while on bed rest

While on bed rest the person needs to be turned regularly from side to side to relieve pressure. Turning him will also help to keep his lungs clear of phlegm. If he starts to develop phlegm in the lungs, raise the foot end of the bed two bricks high so that his feet are a little higher than his head. This will help to drain the phlegm from his lungs so that it can be coughed up and spat out. The foot end of the bed should be raised up two times each day for about 20 minutes each time. It is best to do this when the person is lying on his side. If he is still on skull traction be careful that the traction weights do not touch the floor when the end of the bed is raised. To help keep the lungs clear he must be encouraged to breathe as deeply as possible as regularly as possible.

## 2.5 Feeling Faint and Dizzy When Sitting or Standing

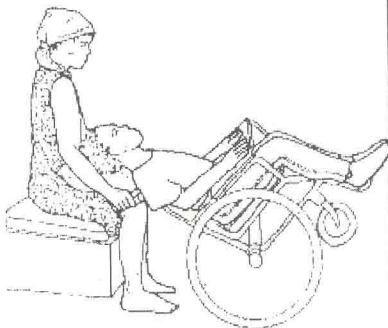
Feeling faint or dizzy is common amongst people who have a tetraplegic injury and some people who have a high paraplegic injury. This happens because the circulation in the paralysed parts of the body is poor. The faint and dizzy feelings are common when sitting or standing after a long period of lying in bed. These feelings may happen for a few days every time she sits or stands. For some people the feelings may last for up to one year.

### How to decrease the risk of becoming faint or dizzy?

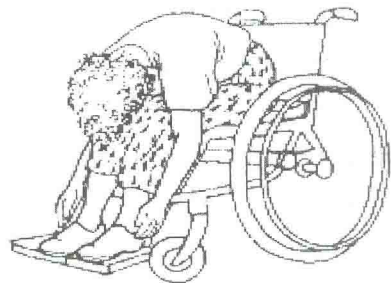
To decrease the risk of becoming faint or dizzy after lying in bed for a long period of time, she should be sat in a semi-reclined position in bed for a week or two, before sitting in a wheelchair. She stays in this semi-reclined positioned for two hours, two or three times a day. To decrease the risk of her becoming dizzy or faint when starting to stand it is best to become use to sitting first. Only begin to stand her when she does not feel dizzy or faint when sitting.

### If the person feels faint or dizzy:

When sitting in a wheelchair:



Tilt the wheelchair backwards or bend forwards.



Stay tilted backwards or bent forwards until the faint or dizzy feelings go away.

### When standing:

Bend forwards over the table of the standing frame. If the dizzy or faint feelings do not stop then sit in the wheelchair. He may need to be tilted backwards or need to bend forwards when sitting.

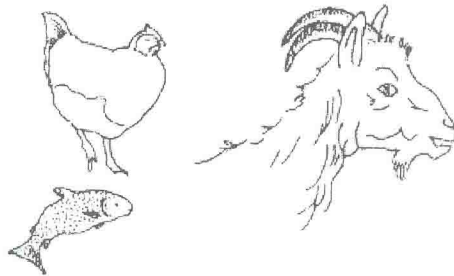
## 2.6 What to Eat and Drink

People with spinal cord injuries must eat a variety of good food and drink about three litres of water everyday to stay healthy and to manage their bladders and bowel properly.

### Healthy eating



- . Eat a wide variety of foods every day.
- . Eat food which is high in fibre.
- . Eat plenty of fruit and vegetables.
- . Do not eat much fat and sugar, especially if the person is overweight.



Eat food with plenty of fibre which is found in fruit and vegetables, beans and pulses, brown rice and whole meal flour. Fibre makes faeces soft and easier to empty and reduces the need for laxatives.

Eating food which is high in fibre will only be effective if the person drinks about three litres of fluid a day.

### What to drink

Drink about three litres of water a day to keep the bladder clean and to prevent a urinary tract infection. Drinking this much water will also help to make faeces soft. The water must be clean. If the water available is not clean it should be boiled for 20 minutes and cooled before drinking.

The person may drink tea, coffee and juice instead of water.

Milk is important for providing protein and a wide variety of vitamins and minerals. Drink no more than 600 millilitres a day. More than this amount may cause problems with the kidneys.

## **2.7 Swollen Hands and Feet**

The paralysed parts of the body may become swollen. Swelling occurs because the circulation is poor. Swollen hands and feet are common during the period of spinal shock. Swollen hands are common amongst people with high tetraplegia who are unable to move their arms. Swollen feet are common amongst these people with floppy legs. It is important to try to decrease the swelling. Swelling can cause the hands and feet to become deformed.

### **How to prevent and treat Swelling**

- Whether in a wheelchair or in bed support swollen hands on pillows so that the hands are higher than the elbows.
- Wear hand splints if necessary.
- Gently move the joints of the swollen parts.
- Support swollen feet higher than knees by raising the foot end of the bed two bricks high. If the swelling goes down over night while laying in bed then it is not too serious, but if the swelling does not go down then stay in bed.
- Keep as active as possible.

## **2.8 Deep vein thrombosis (DVT)**

If the swelling does not go down very much even after being elevated for some time, and the swollen part of the leg or foot is warm to touch a deep vein thrombosis may have developed. This is a very serious problem. The person must see a doctor immediately and must rest in bed. The doctor will give some medication to remove the deep vein thrombosis. DO not move his leg until the doctor is satisfied that the deep vein thrombosis has disappeared.

## **2.9 Staying Cool in Hot Weather and Warm in Cold Weather**

The normal body sweats to stay cool in hot weather and shivers to stay warm in cold weather. People who have a spinal cord injury are unable to sweat or shiver in the parts of their bodies which are paralysed. People with tetraplegia or high paraplegia will be affected more. This is because most of their body is paralysed. So most of their body does not sweat or shiver.

## **Hot weather**

The paralysed parts of the body may become hot in hot and humid weather. By becoming hot the paralysed part of the body will become dehydrated. This may lead to bladder problems and a high fever or heat stroke. Heat stroke is a very serious condition which can lead to death. If the paralysed parts of the body become too hot it will take a long time to be able to cool them down again.

To prevent the paralysed parts of the body from becoming too hot the person must stay in the shade as often as possible, wear a hat and wear cool clothing, avoid getting sunburnt and drink plenty of water. Spraying water over his body or using a fan will help to keep his body cool.

## **Cold Weather**

The paralysed parts of the body may become cold in cold weather. By becoming cold he may develop chest problems, have difficulty breathing or at the very least a cold. A serious chest infection can lead to death.

When the weather is cold he must wear warm clothing. Wear several layers of clothes to keep warm. If possible do not spend too long outside. Stay inside where it is warmer. Do not sit too close to an open fire because this may cause a burn on a paralysed part of his body.

### 3. Promoting Independence

#### 3.1 Moving the Paralysed Parts of the Body

##### How to move the paralysed parts of the body?

It is very important that the paralysed parts of the body are moved every day. This will prevent contractures from developing. The movement will also help the circulation and prevent swelling. If the person is not able to move the paralysed parts of the body himself someone else must move them for him.

- Moving the paralysed parts of the body should begin immediately after the injury while he is on bed rest.
- The paralysed parts of the body should be moved at least once a day.
- Because he cannot feel, the paralysed parts of his body must be moved carefully and gently.
- Each movement should be done 5 to 10 times.
- Each movement should be done slowly and rhythmically.
- If a movement is difficult because of spasm or contracture then move the affected part of the body more times.
- If there is any tightness during the movement hold the affected part of the body in the stretched position for about 10 seconds so the movement becomes easier.

**Before moving the paralysed parts of the body it is very important to make sure he does not have a deep vein thrombosis (DVT)**

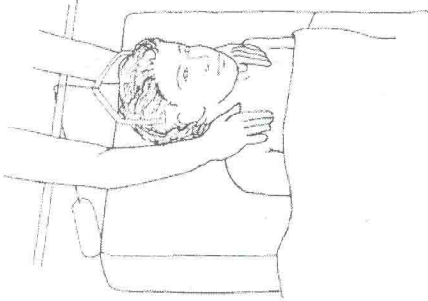
After a spinal cord injury the circulation slows down in the paralysed parts of the body. This causes the blood to form clumps. The clumps are a DVT and may block a blood vessel. It happens most commonly in the legs soon after the injury. A sign of DVT is a localized swelling in his leg which feels warm to touch.

**Do not move the paralysed parts of the body if he has a DVT.** He needs to be treated with anticoagulant tablets prescribed by a doctor. Do not move the paralysed parts of the body until the doctor says it is safe to do so.

## Movements while on bedrest

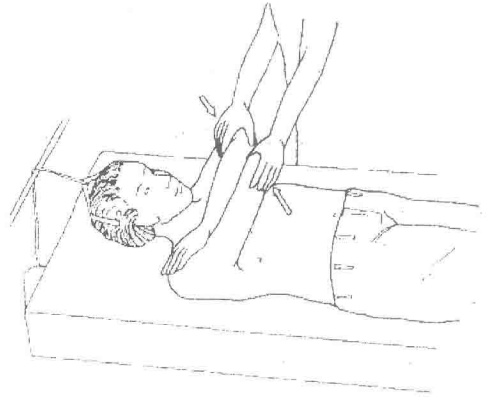
### GRADES ONE, TWO AND THREE

If the person has difficulties is unable to move his shoulders and arms:

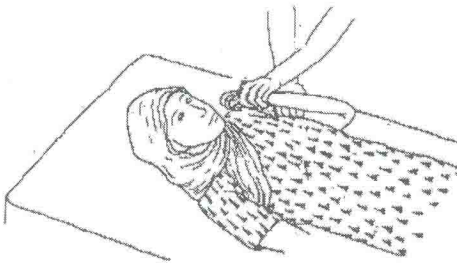


- Gently push both his shoulders down at the same time.

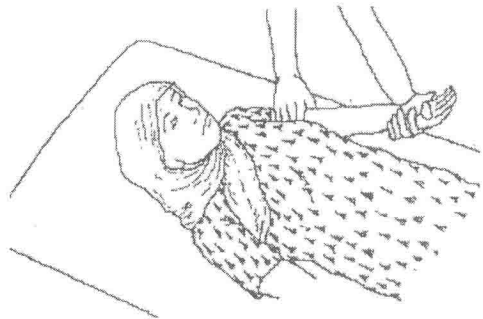
- Place his elbows forwards of his shoulders
- cross both his arms over his chest
- gently push each elbow towards the opposite shoulder to stretch between the shoulder blades.



If the person is unable to or has difficulty moving her elbow:

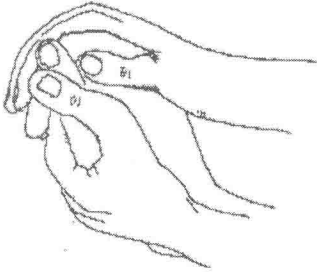


- Straighten her elbow fully while holding her wrist bent back

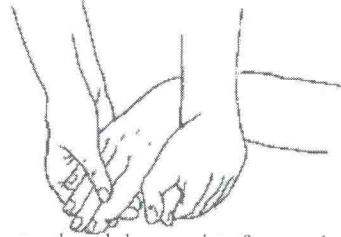


- bend her elbow fully

If the person is unable to or has difficulty moving the wrist and fingers:



- Bend her wrist backwards while making a fist with her fingers and thumb



- bend her wrist forwards so that her fingers straighten and her thumb moves away from her index finger.

This is very important for people at Grade Two or Three. It helps them to hold things like a spoon.

All the people at Grade One, Two or Three also need to have their legs moved everyday.

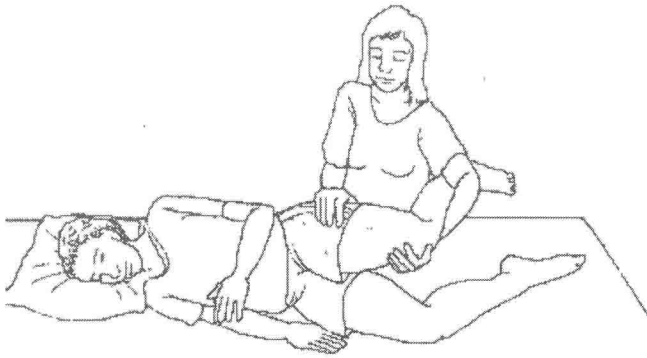
### **GRADES FOUR, FIVE AND SIX**

People at Grades Four, Five or Six need to do exercises to strengthen their arms while in bed by lifting weights. They should initially lift weights with both arms at the same time so that they put an even strain on the injured backbone and spinal cord. This reduces the risk of causing further damage to the spinal cord. As they become stronger they will be able to lift weights with one arm at a time.

The person will initially need to have his legs moved for him. It is very important that he does not have his legs bent at the hips more than 45° for the first six weeks. This is to protect the backbone which needs time to mend. After six weeks his legs can be bent at the hips to 90°. This is done with the knees bent. This is needed for sitting in a wheelchair. Bending his legs at the hips with the knees straight must wait until the backbone is completely mended.

People at Grade Five or Six will be able to walk using callipers. To walk well in callipers their legs must be able to move backwards at the hips. This movement needs to be done while on bedrest. To move the legs backwards while on bedrest he must be lying on his side.





- Bend his top leg and support his knee
- put your other hand on his hip to stop the backbone from moving bend his top knee and gently pull the leg backwards.
- The ankles and feet must also be moved.

For the person to sit correctly in a wheelchair and stand correctly in a standing frame it is important that there are no contractures in the legs.

### **Movements when sitting in a wheelchair**

Once the person is sitting in a wheelchair there may not be a need to do specific movements of the legs as long as he is active and doing things. If he lies on his abdomen and stands regularly then there will be little need to move the legs .

People at Grade One or Two will need to have their arms and hands moved everyday.

## **3.2 Exercises**

### **How to do exercises**

To learn to move and do things after a spinal cord injury it is very important to make the muscles that are not paralysed stronger. To make these muscles stronger the person must exercise.

These muscles can be made stronger by lifting heavier weights or by lifting the same weight more often. Exercises must be taught carefully. The person must be able to repeat the exercise exactly. Teach the exercise without using a weight first. The person must be able to do the exercise without any effort before using a weight.

When choosing a starting weight it should be a weight that the person can lift ten times with some effort. The person must repeat the exercise an agreed number of times and do these exercises twice every day. The person should increase the number of times the weight is lifted first and then increase the weight being lifted.

### **When to start exercising**

Exercises should start as soon as she is medically stable after the spinal cord injury, while she is on bedrest. The doctor must say that exercises can start.

### **How long to continue exercising**

When the muscles that are not paralysed are strong the person will be able to move on and off the wheelchair, push the wheelchair and do many things without help. When the person is doing things without help the activity will keep the muscles strong. There will be less need to exercise unless she wishes to continue.

### **Exercises for the neck**

#### **GRADE, ONE**

Those at Grade One will need to strengthen their neck muscles. These muscles hold the head up when sitting. Once the person is off skull traction neck muscle exercises can start. Always check with the doctor before starting the neck exercises.

- She lies on her back in bed and pushes her head into the bed without lifting up her chin.
- She should push her head into the bed, hold this position, count to four and relax.
- She should repeat this 10 times and do this two times everyday.
- Increase the difficulty of this exercise by increasing the number of times she does this and by holding the push down for a longer time.

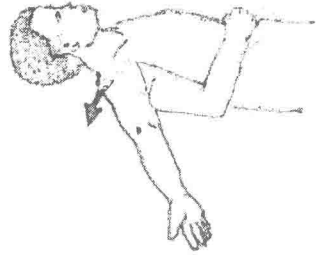
## Exercises for the arms

### GRADES TWO AND THREE

In the bed:

#### 1. Lying on his back:

- His arms should be by his side
- both elbows are bent a little
- he straightens his elbows by turning his arms outwards' so his palms face upwards.



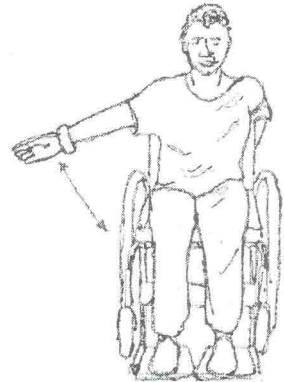
#### 2. Lying on back:

- tie weights onto his wrists
- his arms should be straight down by his sides with his palms facing upwards
- he lifts his arms off the bed a few inches keeping his elbows straight
- he lowers his arms slowly back onto the bed.

In the wheelchair:

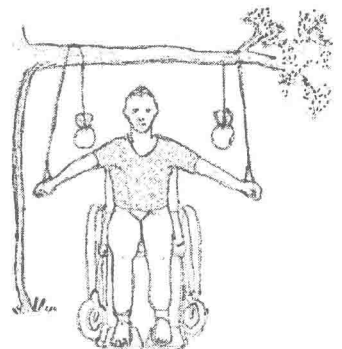
#### 1. Sitting in the wheelchair, wearing a chest strap if he is unsteady:

- tie weights onto his wrists
- he loops one arm around the push handle of the wheelchair to keep his balance
- he lifts his other arm away from his side; keeping the elbow straight and palm facing upwards
- he lowers his arm back down to his side
- he exercises his other arm in the same way.



#### 2. Sitting in the wheelchair, wearing a chest strap if he is unsteady:

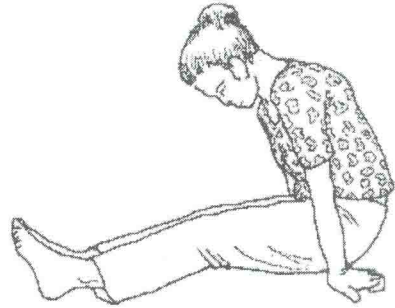
- he puts both forearms through loops
- he holds his arms away from his sides at shoulder level
- he pulls both arms down towards his sides with his palms facing downwards
- he lifts his arms up slowly



The weights can be made by filling bags with sand. The weight can be increased by putting more sand in the bags or using more than one bag: If the person is unable to hold the bags then each bag should be tied to the wrists.

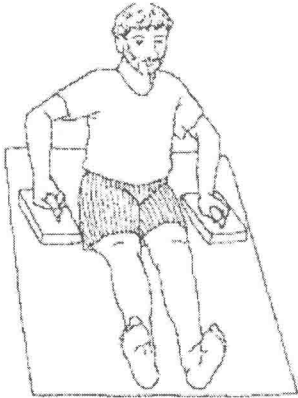
On the mat:

1. Practice rolling and balancing
2. Sit on a mat with her legs stretched out to the front
  - place her arms by her side with hands on mat beside her buttocks.
  - her arms are fully straightened with her elbows locked
  - she pushes down with her shoulders to lift her buttocks off the mat.

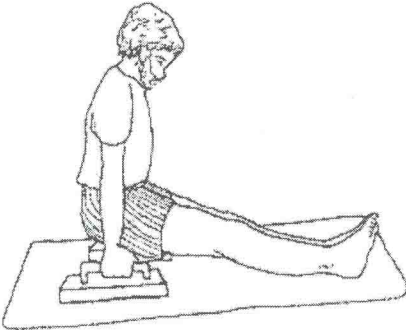


### GRADES FOUR, FIVE AND SIX

On the mat:



- he pushes down on the lifting blocks while straightening his elbows and bending his head forwards
- his buttocks should lift off the mat
- he must repeat this exercise as many times as possible
- with his buttocks off the mat he may move them forwards, backwards or sideways.



- He sits on mat with legs stretched out to the front
- he holds the handle of a lifting block in each hand
- he places lifting blocks beside his buttocks

In the wheelchair:



1. Sitting in the wheelchair:

- She puts the wheelchair brakes on
- she holds the armrests or wheels of the wheelchair
- she pushes down on to lift her buttocks off the cushion
- she lifts her buttocks off the cushion for the count of four
- she lowers her buttocks slowly back onto the cushion.
- To make it more difficult she can increase the number of times she does it and then increase the length of time her buttocks are off the cushion.

2. Sitting in the wheelchair:

- She exercises her arms using a pulley system.
- She can hold the loops and either exercise one arm at a time or both arms together.

### Exercises to improve sitting balance

At first, most people who have had a spinal cord injury will find it difficult to sit without falling over. This is because some or all of the muscles which help them to sit are paralysed. They will also be unable to feel how they are sitting. Most people can improve their balance. They can learn to sit by supporting themselves with their arms, and they can learn to balance by moving their head, shoulders and arms.

When practicing sitting balance:

- She sits on a bench, feet flat on the floor, thighs well supported at 90 degrees.
- When she first practices sitting a helper should stand close behind her. The helper should be ready to hold her if she loses balance.
- She should try to support herself sitting on a bench using her arms.
- She should try to find the best position for balancing by moving her head and shoulders until she is stable.

- If possible she should sit in front of a large mirror so she can see how she is sitting.
- When she feels stable the helper can stop holding her but should stay behind her in case she falls.
- If she learns to sit and balance without help then she must practice moving her arms while keeping her balance.
- When she can balance and move her arms she should practice with her eyes closed as this will be much more difficult.
- Practice balancing for 15 minutes two times a day.
- by practicing every day she will reach her highest Grade of balance within two to three months.

### 3.3 Learning to Roll and Sit Up

#### Learning to Roll

#### GRADE ONE

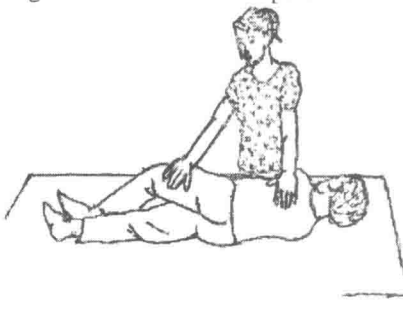
The person will be unable to roll without help.

Rolling her away from the helper:



- . Cross her legs and turn her head away from you.
- . place your forearms under her buttocks
- . gently lift and pull her buttocks towards you so that she rolls away from you.

Rolling him towards the helper:



- . Bend the leg which is furthest from you
- . place one hand behind his shoulder
- . place your other hand on his thigh
- . gently roll him towards you.

Once the person is on the side you must position the underneath shoulder slightly forwards. This stops the person from rolling onto their front and reduces the pressure between their shoulder blades.

#### GRADES TWO AND THREE

When rolling to her right:



- Cross her left leg over her right side
- she places both arms over to her left side\* and towards her right



she throws both arms over to her right  
at the same time she lifts her head up  
so she lays on her right side.

## GRADES FOUR, FIVE AND SIX

People at these grades may find it easier to cross their legs first. They can roll over by pulling themselves in the direction they want to go.

### Learning to sit up

To learn to sit up without help the person will need to practice a lot.

## GRADE ONE

Those people at this grade will need help to sit from lying down.

## GRADES TWO AND THREE

Sitting from lying down using loops:



- He places his right forearm into the side loop
- he pulls on this loop so that he turns to his right side to lean on his right elbow
- he must bend his head towards his right side
- he places his left forearm into the loop which comes from the bottom of the bed



- he pulls himself forwards by raising his left forearm
- he balances on his right elbow



- he takes his left arm out of the loop and throws this arm behind him
- his left elbow must be straight with his left hand on the bed



- he leans over onto his left arm
- he straightens his right arm
- he slowly pushes himself into a sitting position
- he must bend his head and shoulders forwards.

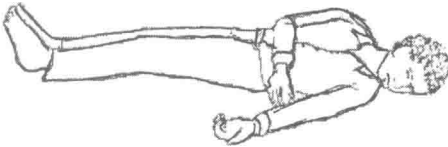
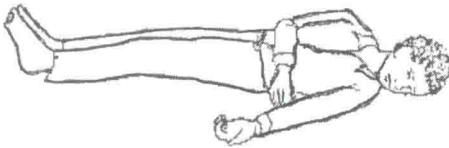


## GRADE THREE AND FOUR

Sitting from lying down using a rope ladder:

- She may find it easier to sit in bed using a ladder made of rope which is attached to the end of the bed
- she pulls himself up by pulling on the rungs of the ladder with her wrist bent backwards or with her forearms
- she may need to lean on one elbow as she pulls herself up

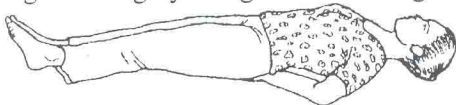
Lying to sitting by rolling onto the left side:



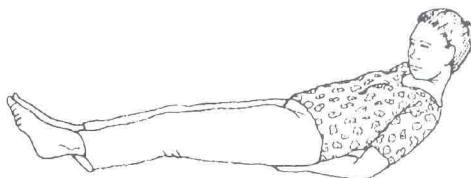
- He rolls onto his left side by turning his head towards his left side and throwing his right arm across his body
- he brings his right arm across so that both his elbows are on the floor
- he walks on his elbows towards his legs
- he walks towards his legs until his trunk is at right angles to his legs
- he hooks his right forearms over his right thigh
- he pulls himself into sitting with his right arm and pushes with his left arm.

Sitting from lying this way will take a lot of practice.

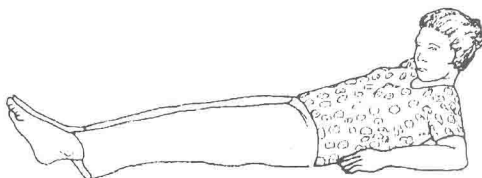
Lying to sitting by using her wrists to get onto her elbows:



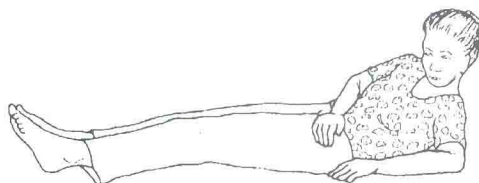
- She pushes both her wrists under her thighs with her palms facing downwards



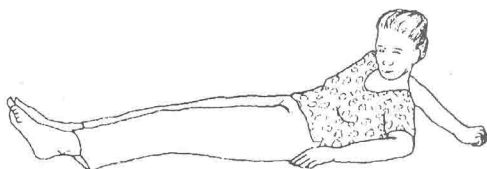
- she pulls on her wrists to bend her elbows while pushing her head and shoulders forwards



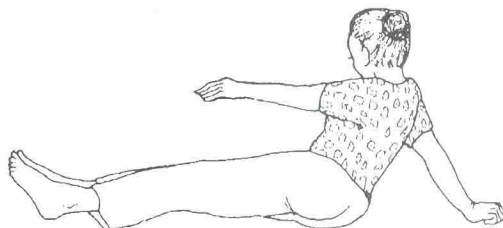
- she pushes her weight from side to side and brings her elbows in and backwards



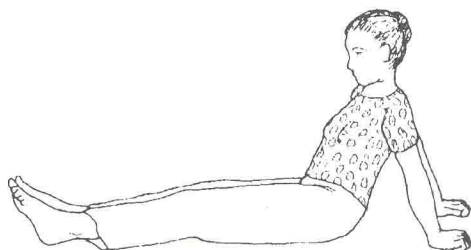
she balances on her left elbow and brings her right arm across her trunk



- she throws her right arm behind her and straightens it putting her palm downwards



she balances on her right hand and brings her left arm across her trunk

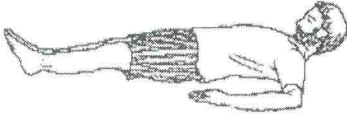


- she throws her left arm behind her and straightens it, putting her palm downwards
- she slowly pushes her body more upright while bending her head and shoulders forwards until she is sitting.

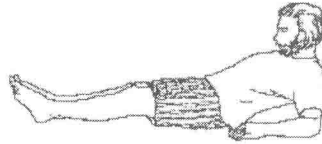
**Sitting from lying using this way will take a lot of practice**

## GRADES FOUR, FIVE AND SIX

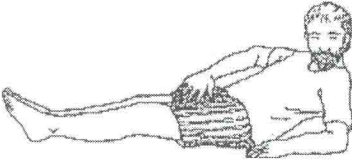
Sitting from lying:



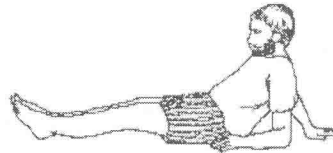
- He puts his elbows out to the side and pushes down
- he bends his head and shoulders forwards



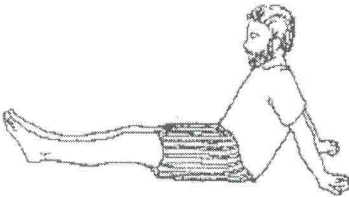
- he brings his elbows in so that he lifts himself onto his elbows
- he holds his head and shoulders forwards



- he leans on his left elbow and balances



- he places his right arm behind him and straightens it



- he leans on his straightened right arm and balances
- he places his left arm behind him and straightens it
- he pushes his body more upright with his head and shoulders forward until he is in sitting.

**Sitting from lying using this way will take a lot of practice.**

### 3.4 Washing

Washing daily is an important part of living with a spinal cord injury. Keeping the body clean, particularly around the buttocks and genitals is necessary to prevent infection and pressure sores. The person must wash after defecating. People who have tetraplegia will require help and some equipment to wash themselves. Most people who have paraplegia will wash themselves without help but may require some equipment.

#### Different ways to wash

#### GRADES ONE, TWO AND THREE

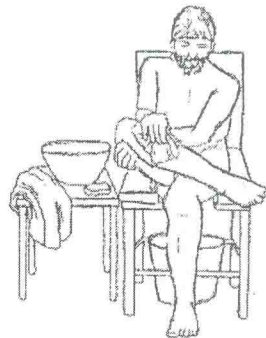
If she, is unable to sit on a commode, requires lots of assistance or does not have space to wash in her bathroom it may be easier to wash her on the bed.

- Line the bed with towels to prevent the mattress and bedclothes from becoming wet.
- If the mattress and bed clothes do become wet then they must be thoroughly dried before she sleeps in the bed.
- She must be washed thoroughly when having a bed bath.

#### GRADES TWO, THREE, FOUR, FIVE AND SIX

If he is able to sit, a chair or a commode can be used for washing. A commode has a hole in the seat. This hole makes it easier to clean the buttocks and genitals.

If the wheelchair seat is adapted it is possible to use the wheelchair as a commode. However the wheelchair must be completely dry before using it as a wheelchair. In hot countries the wheelchair can be put in the sun to dry while he is dressing.



**It is very important that he checks the temperature of the water before having a wash. Water which is too hot can cause burns to the skin.**

### 3.5 Dressing

Learning to put on and take off clothes after a spinal cord injury may take a long time. It will take many hours of practice.

Some people with tetraplegia will need help to dress and undress. Some people with tetraplegia may prefer to have another person dress and undress them even though they could do it themselves. It may be quicker for someone else to do it. Other people with tetraplegia may want to dress and undress themselves.

All people with paraplegia should be able to dress and undress without help.

#### Tips for dressing

- Wear loose fitting clothes. Clothes should be at least one size larger than the clothes he normally wears. Loose clothing is easier to put on and take off.
- Trousers should not have thick seams or pockets at the back. These may cause pressure sores when he is sitting down.
- If his trousers have back pockets he must never put anything in them, such as coins or a comb. This will cause a pressure sore. Instead, he should use a waist bag or a bag attached to the wheelchair in which to carry things.



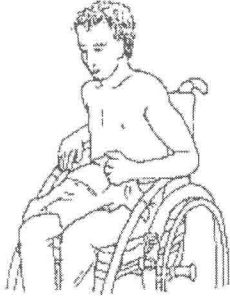
A button hook may be useful for doing up and undoing buttons.

## How to dress and undress

There are many different ways to dress and undress. The following are examples of what may work. The person should try different ways to see what works best. For some people it will be easier to dress and undress in the wheelchair. For others it will be easier on the bed. Others will use both the wheelchair and the bed.

### Putting on and taking off shirts and dresses

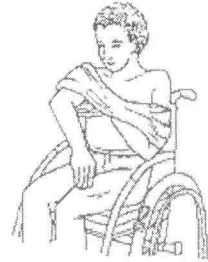
Over the head:



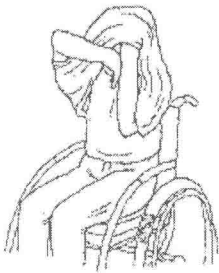
- He places the shirt face down with neckline nearest his knees



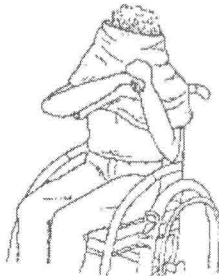
- he puts his in the sleeves one at a time - he may use his teeth to pull the sleeve over his hands



- he pulls each sleeve up his arms past his elbows



- he holds the neckline of the shirt, lifts both arms up together and puts the neckline over his head



- he pulls the neckline down over his head



- he puts one hand underneath the front of the shirt and then pulls it down



- he pulls the back of the shirt down by leaning to one side and putting his hand underneath the back of the shirt.

To remove the shirt or dress:

- She puts one hand inside the shirt and pushes off the opposite sleeve
- she does the same to the other sleeve she lifts the shirt over her head.



## Putting on and taking off pants and trousers

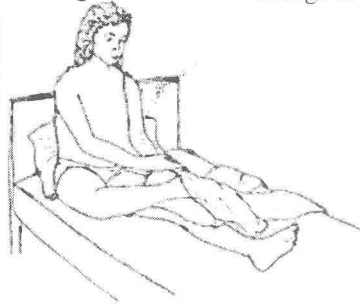
To put on and take off pants and trousers the person must be able to sit in bed with the legs straight or on a wheelchair without support. Loops sewn onto pants and trousers may help those who have a weak grip.

Putting on trousers with straight legs:



- He bends forwards so his chest rests on his thighs
- his legs are straight
- he pulls his trousers over the feet and up his legs.

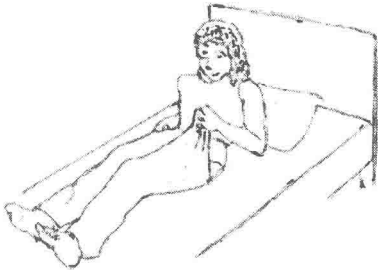
Putting on trousers with legs crossed:



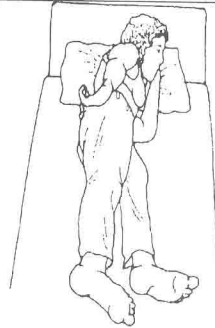
- She crosses one leg over the other leg to pull her trousers on
- she does the same to the other leg

To pull pants or trousers over her hips it will be easier in bed. However if she has good balance she can do this while sitting in a wheelchair.

Pulling trousers over hips while on the bed:



- She lies on her back
- she pulls her trousers up as far as she can



- she rolls to her left side
- she pulls her trousers up over her right hip



- she rolls to her right side
- she pulls her trousers up over her left hip
- she repeats until her trousers are on properly

It may be easier for her to pull up pants and trousers in bed if there is an overbed strap or straps attached to the side of the bed.

Pants and trousers can be removed by doing the reverse of putting them on.

## Putting on and taking off socks and shoes

### Socks:

Socks may be put on by either leaning forwards with legs straight in the bed, or by crossing one leg over the other, while either sitting on the bed or on a wheelchair. The person can use the same way in which trousers and pants are put on to put on socks.

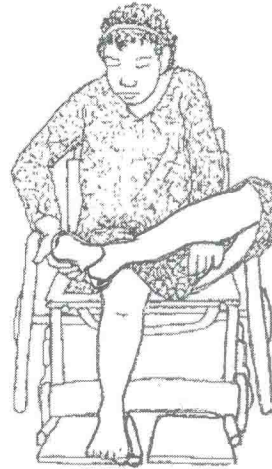
It may be easier to pull socks on if a loop is sewn onto them.

### Shoes:

Shoes may be put on the same way as socks.

It may help if a loop is attached to the rear of the shoe.

The laces should not be done up tightly. If the person is unable to do up laces, the laces can either be left loosely done up, or the person buys slip-on shoes or shoes with Velcro tabs.



## 3.6 Standing

### Why stand?

Standing is very important because it:

- Straightens the person's hips and knees.
- Keeps the person's feet in a good position.
- Reduces the number and the strength of spasms the person may have.
- Facilitates emptying of the person's bladder and bowels.

### Who should stand?

Everyone who has a spinal cord injury should stand. It will be difficult to stand those people at Grade One. People at Grades One, Two, Three and Four will only be able to stand in a standing frame. They will need at least two people to help them into the standing frame. People at these grades will only be able to stand. They will not be able to walk.

People at Grades Five and Six will start standing in a standing frame. After at least three to four weeks of standing in a standing frame they can practice walking between parallel bars while wearing callipers.



## **When to start standing**

### **GRADE ONE AND TWO**

Start standing when the person is able to sit in wheelchair without feeling dizzy for up to seven hours. Usually about six weeks after getting out of bed.

### **GRADE THREE, FOUR AND FIVE**

Start standing after four to six weeks of balancing exercises.

### **GRADE SIX**

Start standing after two weeks of balancing exercises.

### **How long should the person stand?**

Stand for at least one hour two times a week as a minimum.

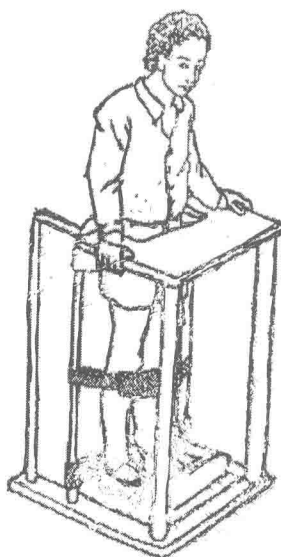
Some people like to stand. They may prefer to stand every day.

Not everyone wants to stand. Although they should be encouraged they should never be forced.

### **Standing in a standing frame**

To stand:

- Lift him up from the wheelchair
- lean him forward over the table of the standing frame
- his chest should lie on a pillow on top of the table
- his arms should hang down in front of the table
- his legs must be straight
- buckle the strap which goes behind his buttocks
- lift his chest off the table so he is standing upright
- he should help by pushing himself up with his arms
- he should lean on his hands with his arms straight to stay upright.



If he becomes dizzy when he is standing he should:

- Lean forward so his chest is on a pillow on top of the table and his arms hang down in front of the table
- he should lean forward for two to three minutes
- after this he should stand upright again
- if he becomes dizzy again he should lean forward
- if he continues to feel dizzy he should sit down in his chair
- he should try to stand again later in the day or try again the next day.

### 3.7 Walking with Callipers

Only those people at Grade Five and Six or those with an incomplete spinal cord injury will be able to walk. They will need to wear callipers and use crutches. Callipers are made by orthotic technicians. Some will find walking in callipers and crutches takes too much effort and prefer to use a wheelchair. Some will walk for exercise but will use a wheelchair for moving around. Most people will use long leg callipers. Some people at Grade Six will use short leg callipers.

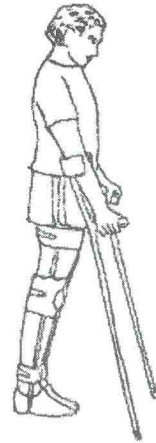
All walking must be taught in the parallel bars before practicing with crutches. When the person is safe between the parallel bars, practice walking with one crutch and one of the bars. When the person is safe doing this, practice walking with two crutches.

If the person is going to walk with callipers and crutches everyday, then the callipers should be put on every morning when dressing.

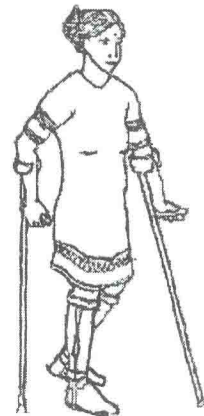
The callipers must be put on correctly. If the callipers are put on incorrectly, they will cause a pressure sore.

Begin by wearing the callipers for one hour a day, remove them and then check for any skin damage. Gradually build up the length of time the callipers are worn each day. By the end of four weeks the callipers should be worn all day as long as there are no skin problems. If the callipers cause a pressure sore or rub the skin then the orthotic technician needs to make adjustments to them so they fit correctly.

To learn to walk the person will need to do a lot of practice.



Long leg callipers



short leg callipers

## 4. Living at Home

If the person is using a wheelchair her home and compound will need to be changed. She needs to be able to move around the home and compound using the wheelchair.

The following are suggestions of some things which may need to be changed.

### The ground

The ground around the house should be level and firm so the person can move around easily using a wheelchair.

### Ramps

- A ramp should replace any steps into the house.
- A ramp should be much wider than the wheelchair.
- It should have a level platform in front of the door to the house so the wheelchair does not roll backwards while the person is opening the door.
- The ramp should have a gradient not greater than 1:12.
- There should be a low border or rails on the sides of the ramp to stop the wheelchair from going over the edge of the ramp.

### Doorways

- Doorways should be at least five centimetres wider than the width of the wheelchair.
- If the doorway has a raised sill then a small ramp over the sill is needed.
- The door handles should be easy to turn.
- Curtains may be easier to go through rather than a door

### Bedroom

- The bedroom needs to be large enough to move the wheelchair around.
- The bed should be the same height as the seat of the wheelchair so it is easy to move on and off it.
- A firm sponge foam mattress is essential to prevent pressure sores.
- Clothes should be stored so that they are easy to reach.

### Bathroom

- The bathroom could be combined with the toilet if the room is large enough.
- If using a commode the person can wash in the bedroom or in a screened off area of the compound.
- Towels should be easy to reach.

## Toilet

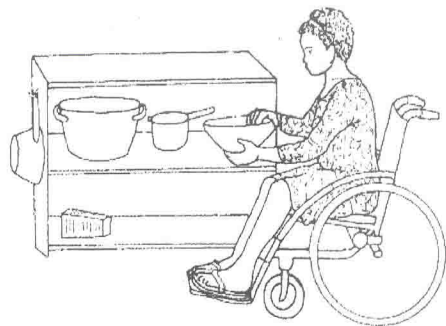
If using an existing toilet rather than a commode the toilet room needs to be large enough for the person to get into on a wheelchair.

- The doorway needs to be wide. The door should swing outwards to allow more space. A curtain may be easier to open.
- There must be room to park her wheelchair beside the toilet. The toilet should be the same height as the wheelchair so it is easy to move on and off of it.
- Everything she needs should be in easy reach of the toilet - toilet paper, washing basin.
- She may need rails beside the toilet to help her with moving onto and off the toilet.
- The toilet seat should be padded to reduce the risk of pressure sores.
- A commode can be used in the bedroom or outside in a screened off area of the compound.



## Floors and furniture

- All the floors should be level and smooth.
- All the loose mats or rugs should be removed.
- All the furniture must be placed so the person can easily move around it.
- Tables should be high enough for the person to sit at while sitting in a wheelchair.
- Shelves should be placed so they are within easy reach from the wheelchair.



## Cooking

If cooking low down then a wall should be between her and the fire to prevent her legs from being burnt. If cooking at a table make sure the table is high enough to get her legs under.



## 5. Keeping Active Following a Spinal Cord Injury

People who have a spinal cord injury can learn to take part in family life, play, go to school, work and become involved with their community. They may require assistance or some equipment to do some of these activities.

The following pictures show the sorts of things people with a spinal cord injury can do. There are many more possibilities. With the support and encouragement of their families, friends and the community they will learn to do what they want to do.

