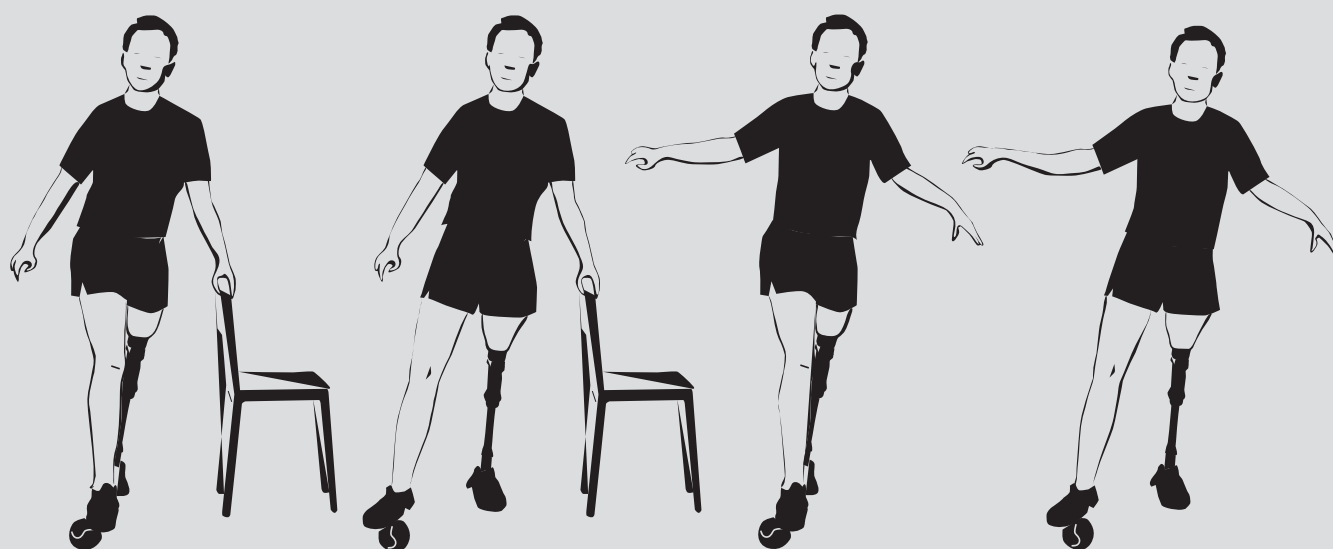


TRAINING TIPS

For leg amputees



3rd edition 2012

IT'S BETTER TO LIGHT A CANDLE THAN TO CURSE THE DARKNESS

TRAINING TIPS

For leg amputees

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This booklet was produced by the Physiotherapy Department at Aker University Hospital, a specialist hospital within the Oslo University Hospital, and MOMENTUM, the Norwegian Limbless Association. This is the 3rd edition and is 100% financed unselfishly and caringly by OVL – Ortopeditekniske Virksomheter Landsforbund.

For more details on OVL and its members throughout the country or to find an orthopaedic workshop, go to www.ovl.no

Please remember throughout that these expert Tips are guidelines to be followed within your own individual abilities and state of health. If in any doubt please consult your therapist.

INTRODUCTION

Keeping yourself in good health is always important, and for leg amputees even more so, as it requires more energy to walk with a lower limb prosthesis. This is a training booklet specially developed for leg amputees, focusing on general exercises that can be easily performed at home both with and without wearing your prosthesis, and that are suitable for beginners and experienced prosthetic users. They are suitable for thigh, above- and below knee limb loss.

The booklet consists of four chapters - balance exercises, strength exercises, walking training and how to prevent contracture by performing elastic rope exercises.

By changing your level of activity, you may find that your prosthesis needs adjustment. It should fit sufficiently well to enable you to train without pain being caused. Consult your Prosthetist if you feel that your prosthesis needs adjustment.

If you have any special problems or illnesses that should be taken into account when training, we recommend consulting your doctor or physiotherapist for help and guidance on the appropriate training programme for you. Contacting a physiotherapist or counsellor at a training centre can also be helpful on how to progress from the exercises described here. There are also walking schools for leg amputees around the country. Contact MOMENTUM on +47 4000 4360 or by e-mail to info@momentum.nu for contact to the nearest location to you.

MOMENTUM expresses especial thanks to physiotherapists Jette Schack and Elisabeth Bø at Aker University Hospital, who were mainly responsible for the content of this booklet. We also thank OVL – Ortopeditekniske Virksomheter Landsforbund for financing the 3rd edition of the booklet you hold in your hand.

GENERAL STRENGTH EXERCISES WITH OR WITHOUT A PROSTHETIC LIMB

A good level of strength throughout the body is necessary to master the use of a prosthesis. The quality of the amputation stump is the key to being able to walk correctly and safely. There are many ways to boost your strength through training and the following exercises have been selected for your abdomen, back, hips and amputation stump. They can also be used to train your upper body and arms. We recommend 6-12 repetitions (reps) per exercise. Perform as many reps as you can until the last becomes excessively strenuous. Take a short break to allow your muscles to recover. Repeat the above 2-3 times (= 1 set). As your strength improves, you can improve resistance you may use an elastic rope or weights to make the exercises more vigorous.

ABDOMEN EXERCISES

- Sit-ups: Lie on your back with bent knees and your foot on the floor. Your stump can rest on a cushion or the like. Pull your stomach in until your spine is in contact with the floor. Lift your head and upper body. Maintain a slow, even movement. 2-3 sets of 6-12 reps.
- Diagonal sit-ups: Lie on your back. The start position is the same as above. Place one arm behind your head and the other slightly to one

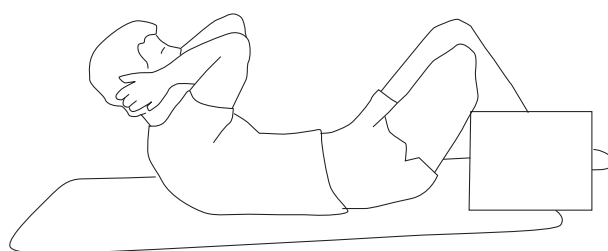


Figure 7 - Sit-up

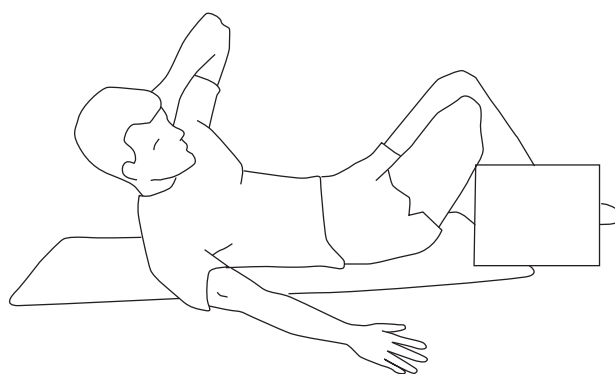


Figure 8 - Diagonal sit-up

side. Lift your head and upper body and twist in the direction of one knee. Keep the small of your back on the floor. Repeat in the opposite direction. 2-3 sets of 6-12 reps on each side.

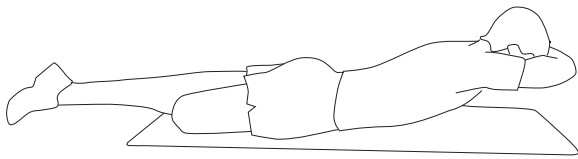


Figure 9 - Face-down back lift

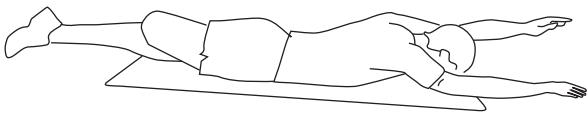


Figure 10 - Face-down diagonal back lift

BACK EXERCISES

- Face-down back lift: Lie on your stomach with arms under your head. Clench your buttocks and lift your upper body off the floor. Hold for a few seconds and then slowly lower again. 2-3 sets of 6-12 reps.
- Face-down diagonal lift Lie on your stomach with your arms above your head. Alternately lift each arm and leg up from the floor and slowly lower them again. 2-3 sets of 6-12 reps on each side.

Progress from this exercise to the following:

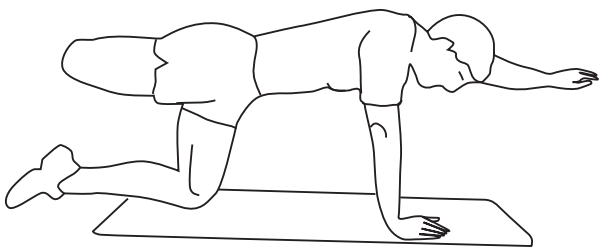


Figure 11 - Hands and knees diagonal back lift

Hands and knees diagonal lift: Stand on your hands and knees (stump if thigh-amputated) with your head level with your upper body. Tighten up and stabilise your abdomen/lower back. Extend one arm and the opposite leg alternately until they are in line with the body. If you have been thigh-amputated, extend your right or left arm alternately or move your stump. 2-3 sets of 6-12 reps.

AMPUTATION STUMP/HIP EXERCISES

- **Buttocks/hip lift:** Lie with both legs/stump on a ball or cushion/box with your arms by your sides. Pull in your stomach and lift your pelvis until lying on your shoulder blades. Hold for a while before lowering slowly to the floor. Make sure that you are using your buttock muscles on the amputated side just as much as on the other side when lifting your pelvis. 2-3 sets of 6-12 reps.

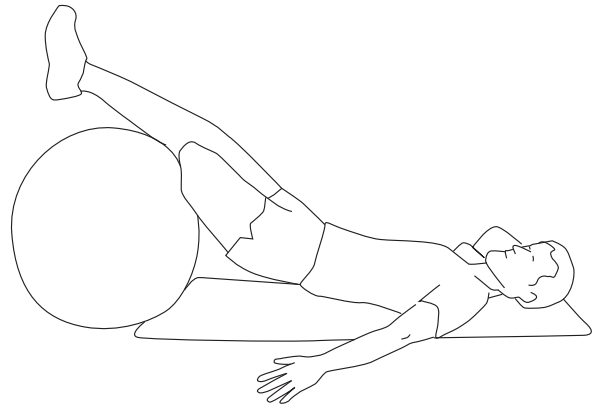


Figure 12 - Buttock lift/pelvis lift with ball

- **Sideways one-leg lift/upper leg:** Lie on your side with leg extended and resting your head on one hand. Raise and lower your upper leg slowly. Ensure that your leg extends in line with or a little behind your body and that all movement comes from the hip. 2-3 sets of 6-12 reps on each side.

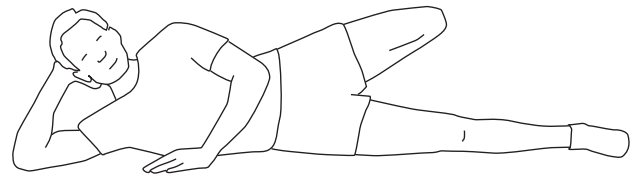


Figure 13 - Sideways one-leg lift upper leg

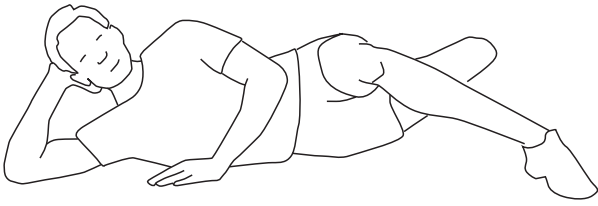


Figure 14 - Sideways one-leg lift lower leg

- Sideways one-leg lift/lower leg: Lie on your side with your head resting on one hand. Cross the upper leg over the lower leg. Lift the lower leg up and lower again. 2-3 sets of 6-12 reps on each side.



BASIC BALANCE EXERCISES WITH A PROSTHETIC LIMB

Many single lower limb amputees have an asymmetric walk. One reason is often that they do not put enough weight on their prosthesis. This applies when walking or standing still and the risk of uneven weight distribution and causing problems elsewhere in the body is high. That's why it is important to train your sense of balance and be able to stand resting your full weight on your prosthesis. The following three exercises may be performed every day. Spend 3-5 minutes on each one, focusing on using the muscles in the amputation stump and buttocks.

1. Switch your weight from side to side: Stand between two chairs placing your hands on the chair backs for support. Stand in front of a large mirror if possible. Spread your feet approximately 10-15 cm apart. Switch your full body weight from right to left focusing on using the muscles in your stump and around your hip joint. Check that you put as much weight on your prosthesis as on your good leg. Gradually reduce the support from your arms.

2. Move your weight backwards and forwards: The same exercise as above, but moving your weight forwards onto your toes and back onto your heel. Start with small movements and gradually increase them. Continue to focus on sharing your weight evenly between your prosthesis and leg. Use the muscles in your stump.

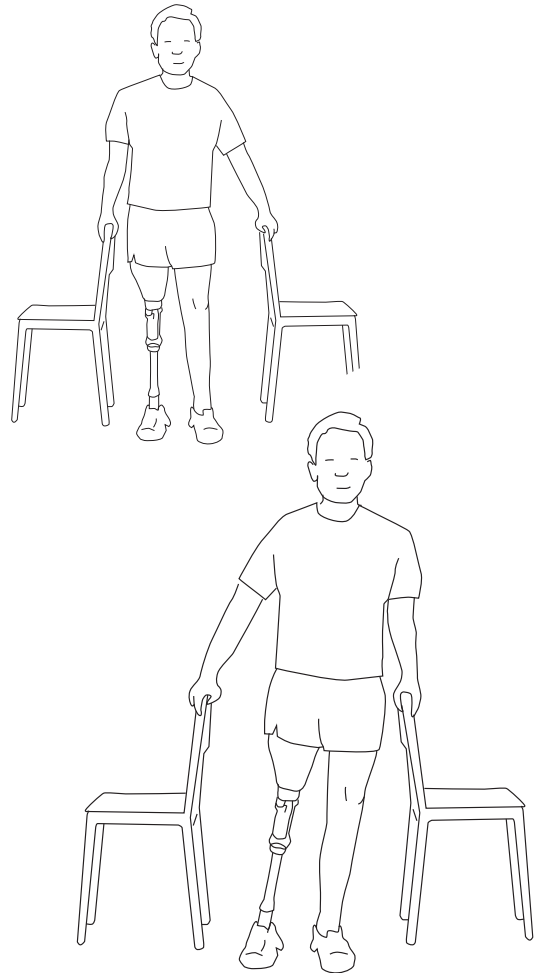


Figure 1 - Switch your weight from side to side

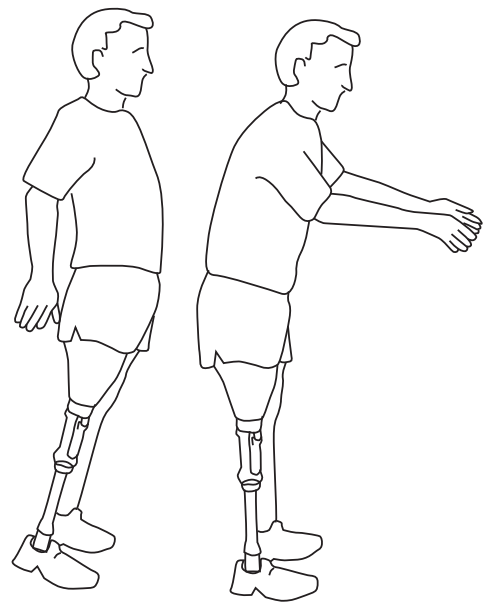


Figure 2 - Move your weight backwards and forwards

If you move your weight too far back on your heels, use your arms to keep you balance and bend forward a little from the hips. If you move your weight too far forward onto your toes, extend your arms behind your body, tighten your buttock muscles and push your hips forwards.

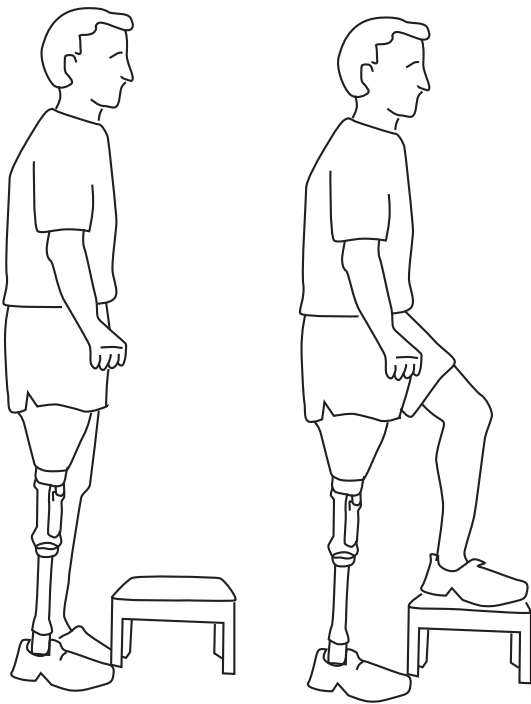


Figure 3 - Stand on your prosthetic leg

3. Stand on your prosthesis: When you are standing balanced with weight evenly distributed between prosthesis and your good leg, practice putting all your weight on your prosthesis. This applies both to beginners and experienced prosthesis users, as many of the latter have never learned to do this correctly. Stand between two chairs as described above. Place a thick book, a small stool or the like in front of you. Slowly place your good leg on the stool and then bring it back again. Transfer your weight onto the leg on the stool as well. Repeat several times. When you feel comfortable with this exercise, reduce the support from your arms by only using the arm on the same side as your prosthetic, and eventually stop using your arms altogether. Perform the exercise slowly and carefully! Make sure that you use the muscles around your hips.

Progress from balance exercises to the next 3. These are more advanced:

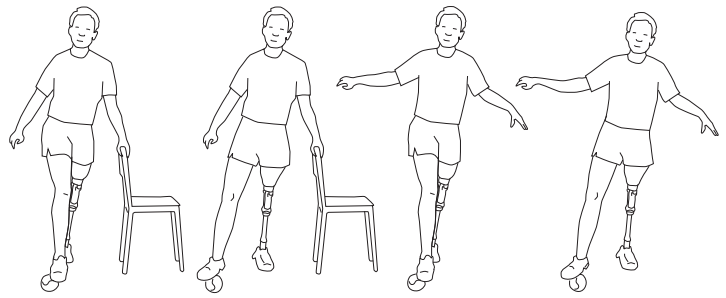


Figure 4 - Ball rolling

4. Ball rolling: Stand with a tennis ball or the like in front of you. Put your good leg on the ball and roll it backwards and forwards, from side to side or in circles. Check that you are especially using the muscles around the hip of the prosthetic leg. Repeat 20 times in each direction.

5. Stretch-kick exercise: You will need a heavy chair or table and an elastic training rope. Secure one end of the elastic around the chair/table leg and the other around the ankle of your good leg. Support yourself on the table or something else if you need to. Move your good leg in different directions backwards and to the side. Keep the elastic as tight as possible to give resistance. The idea is to keep your balance on your prosthetic leg while standing throughout the exercise. Repeat 20 times in each direction.

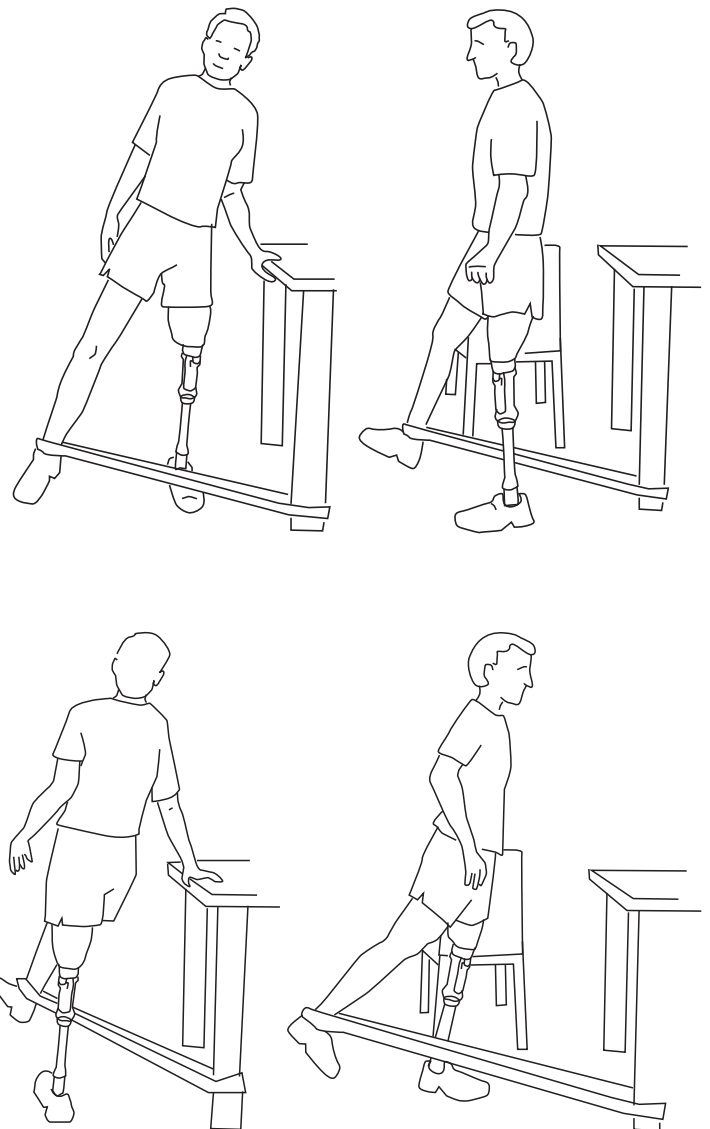


Figure 5 - Stretch-kick exercise



6. Walking over objects: Place 5-10 objects (e.g. plastic cups) in a row on the floor about 40-50 cm apart. Start at one end of the row, lifting your good leg slowly and carefully up and over the first cup. Focus on keeping your balance on your prosthetic leg. Progress by lifting your good leg higher and higher - up to your knee being level with your hips. Walk the entire line backwards and forwards 3-4 times.

Figure 6 - Walking over objects

WALKING TRAINING

In addition to balance and strength training, walking training is also very important. The aim here is to learn the correct walking technique so as to be able to walk safely and as energy-efficiently as possible.

Walk indoors and out. Walk forwards, backwards and sideways. Focus on using the muscles in your stump. If you were amputated below the thigh, try to tense the back of the thigh and buttock. If you were amputated below the calf, try to use the thigh muscle and inside of the thigh. Take equally long strides with both legs. Focus on achieving a steady rhythm. Walk on grass, gravel, sand or any other uneven surface increasing speed as you go. Increase speed by taking longer strides with your good leg first. Include your arms and upper body in the movement (right arm following left leg and vice versa). Practice changing direction and turning around as well. Start turning from the hips. Use your prosthetic leg and do not stand only on your good leg when turning. Take short, even steps and turn to both right and left. Practice achieving a smooth, even movement each time you turn.

Look for places around the house or nearby where you can train, such as by a table or the kitchen worktop. Support yourself on your arms if you need to.

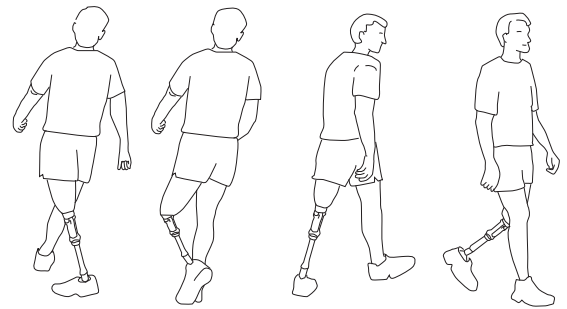


Figure 15 - Walking training

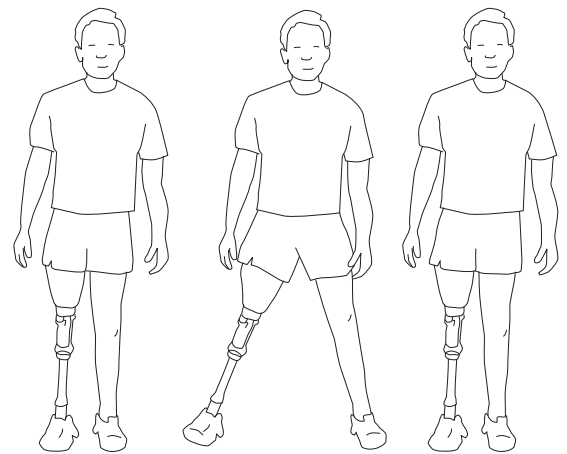


Figure 16 - Walking training

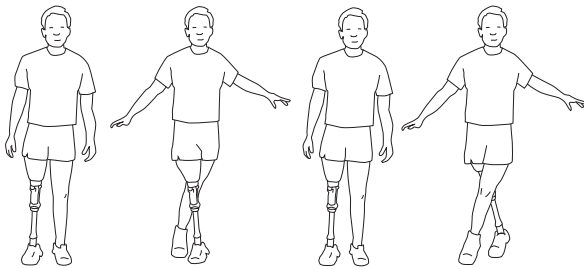


Figure 17.1 - Walking training C

Start by walking sideways with your good leg leading. Focus on keeping your pelvis straight during the exercise and avoid leaning too far over on your prosthetic side when moving your good leg. Vary stride length and speed. Another exercise is to walk with your legs crossing (see figure 17.1)

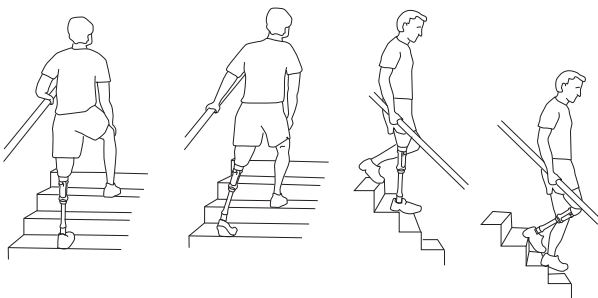


Figure 17.2 - Fitness training

Walking up and down the stairs is excellent training. Do what you feel most confident with first, and never try to force the pace.

Ascending stairs: Good leg first, followed by your amputated leg with crutches or guard rail. Descending stairs: Amputated leg first with crutches or guard rail, followed by your good leg (see figure 17.2). After a while, you will find the method that suits you best.

FITNESS TRAINING

Building up your level of fitness is also important, and you can do so by walking (including climbing stairs), cycling, swimming or the like. Train intensively to increase your pulse rate. You should be out of breath but not get stiff muscles. You can train in intervals, so that you may walk/cycle/swim at speed for 3-4 minutes (or more), reduce speed for a few minutes and then increase it again, repeating 3-4 times (or more). This is an effective means of improving your fitness.

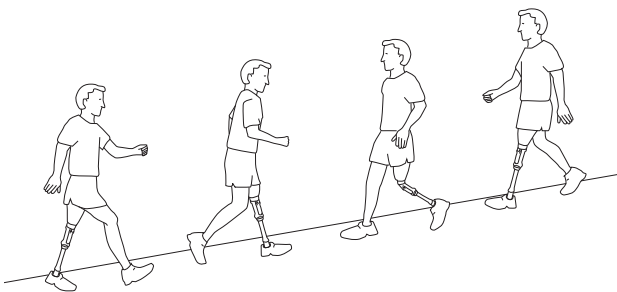


Figure 17.3 - Fitness training

PREVENTING CONTRACTURE

- ELASTIC ROPE EXERCISES

Contracture is reduced mobility in a joint and can occur when the muscles are out of balance after an amputation. Some muscle groups become stronger than others which can lead to the stump becoming forced into the wrong position. For example, a thigh stump can become bent forward in relation to the hip because you sit down a lot, preventing you from stretching your stump out fully. Similarly, you can experience problems with stretching your stump out fully if you have been sitting or lying with bent knees. This can be avoided by practising bending and stretching your knee. If you sit in a wheelchair, you ought to have a support to rest your stump on in fully extended position. When sitting on a chair, rest your stump on a footstool or the like.

Contracture makes it difficult to walk with and position a prosthesis, and can weaken the muscles. That's why it's important to maintain or improve mobility in your whole body and especially in the hips.

- **Back:** Lie on your back with an angle of 90 degrees between hips and knees. Place your arms out to the sides. Alternately rotate your pelvis and legs to the right and left. Rest for 15-20 seconds on each side. Keep your stump and leg together.

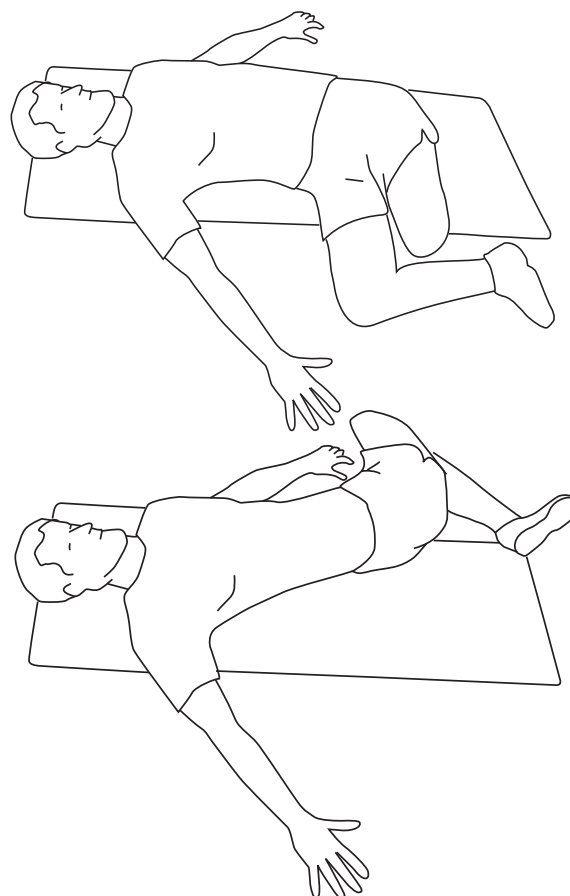


Figure 18 - Back

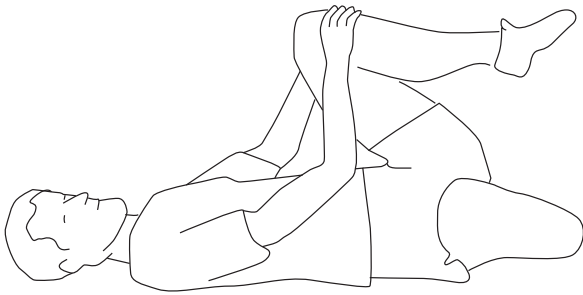


Figure 19 - Hip bends

- Hip bends: Lie on your back, lift one leg and grip the knee. Pull back towards your chest. Press the other leg/stump against the floor. Hold for 15-20 seconds and then change leg.

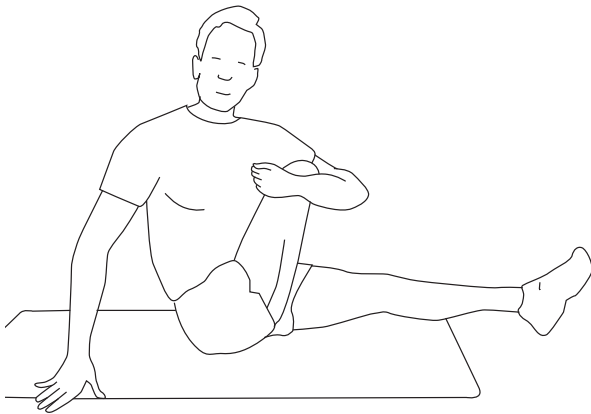


Figure 20 - Buttock muscles

- Buttock muscles: Sit with one leg crossed over the other. Bend and grip the knee and pull it towards the opposite shoulder until you can feel that the buttock muscle is being stretched. Hold for 15-20 seconds and then change leg.

If you have been amputated below the thigh, it can be necessary to lie on your stomach or find some other way to stretch your hips to avoid contracture in the hips.



MOMENTUM

FORENINGEN FOR ARM- OG BENPROTESEBRUKERE

MOMENTUM is a nationwide user association for amputees and their families. Membership is also open to friends, healthcare professionals, institutions, workshops and suppliers.

Our vision is to increase quality of life and inspire prosthetic users, their families and everyone working with the rehabilitation of amputees to make the best of what's available.

MOMENTUM was founded in 1996 and focuses on peer support, creating forums, member magazine, printed and electronic information and political lobbying.

"It's better to light a candle than to curse the darkness" is MOMENTUM's motto, and is a strong indicator of our beliefs and values.

Become a member of your own association - join us today!

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