

ARGO PHYSIOTHERAPY MANUAL

Literature Number L21747, Issue 2, 9th November 1999

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This manual provides information on the operation and use of Steeper Advanced Reciprocating Gait Orthosis as well as guidelines for patient training.



Always refer to the latest issue of this manual, to ensure that important design or safety information is not missed. All information in this manual is correct at the time of publication and may be updated by product bulletins or later revisions. It is essential for safety and the success of the brace that it is correctly specified.

Revision History

L21747 9th November 1999 ARGO Physiotherapy Manual, Issue 2



For a complete guide to fitting an ARGO, please contact your authorised supplier who will advise you on approved courses and supply the ARGO technical manual, L21600.

For further information on tools, additional components for special fittings, growth or replacement, please consult the ARGO assessment and ordering manual, L21597.

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Section 1

The ARGO range of walking braces for adults and children are designed for patients with lower limb paralysis. This manual is provided as a guide to ARGO training.

Training Courses

Assembly and Fitting of the ARGOS should only be carried out by qualified personnel who have successfully attended a RSL Steeper approved training course.

It is strongly advised that all members of the clinic team are familiar of the construction of the braces and are also familiar with the ARGO technical manual.

User registration scheme

A user registration form is provided in the ARGO kit. Details of the patient should be filled in and the form returned to RSL Steeper.

This information can be used by RSL Steeper as a reference for any enquiries concerning that particular patient and can also be entered into our statistical database to provide information for the design of improved braces.

Customer reports

Customer Reports commenting on any aspect of the ARGO braces or their use can be sent to:

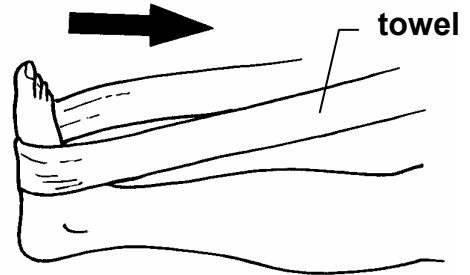
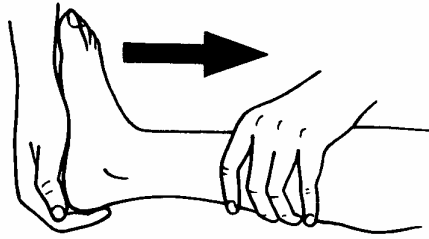
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These reports are reviewed by Quality Assurance and the Design Team so that necessary and worthwhile improvements can be made to the design and construction of the ARGOS.

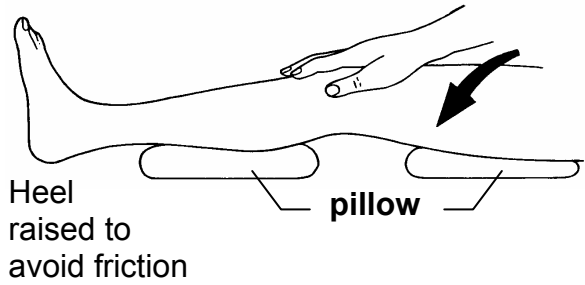
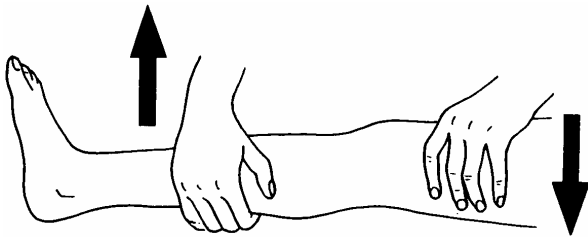
Therapist or Relative

Self-Stretch

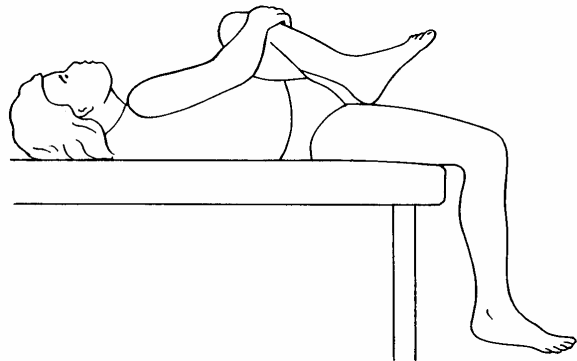
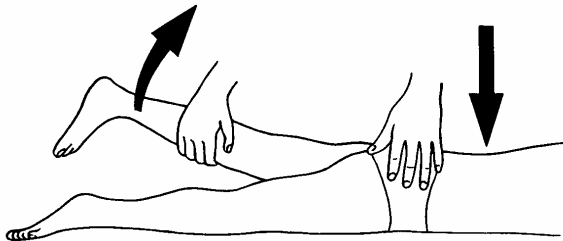
ANKLES



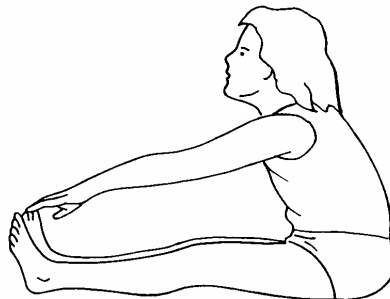
KNEES



HIPS



HAMSTRINGS



Section 2

Most patients will require a programme of training before starting to use the brace. The programme of passive and active exercises will last 1 to 6 months depending on the initial assessment.

Before using the ARGO

Physical Fitness

Some patients may need no pre-brace training, they will meet all of the following requirements:

- a high level of fitness.
- the ability to cope with prolonged exercise.
- had regular standing practice in a frame or other types of orthosis.
- little or no contractures at the hip or knee.

Although in some cases it may be possible for the patient to be supervised regularly by a physiotherapist, it is often a good indicator of the patients motivation and commitment if they can continue the exercise programme at home with only weekly or monthly supervision.

For those patients where distance or work commitments make regular physiotherapy impossible, contact by telephone should be encouraged to maintain the patients interest, sort out any problems and monitor their progress.

Every effort should be made to involve the patient's family at this stage of the programme.

Passive stretching exercises

Passive stretches should be performed to prevent contractures of:

- calf muscles.
- hamstrings.
- hip flexors.



Before starting any passive stretches the joints should carefully assessed and if necessary, X-rayed. Care must taken to not over-stretch the tight structures, as this may not be felt by the patient and injury to the patient could result. Patients and relatives must be warned of this danger if they are to carry out exercises unsupervised.

The diagrams opposite show a number of stretching exercises. If there is no therapist or relative to perform regular passive stretches, the patient should be taught the "self-stretch" methods shown.

Balance training exercises

Balance can be practised by ball throwing and catching, aiming games, such as skittles and basketball, and with resisted balance work with the therapist.

The patient should practice balance exercises in a number of support positions:

- Sat upright with legs over the edge of a bed or chair.
- Sitting with their legs out straight.
- Standing in a standing frame.

Standing Practice

Ideally the patient should stand in a standing frame every day to get used to the upright position and also to assist with passive stretching of the joints.

Active exercise

Active exercises should be directed at the neck, trunk, shoulders, elbows and wrists. Exercises should be done to increase strength and endurance. Increasing resistance and repetitions need to be included in a graduated programme.

The major muscle groups to be exercised are:

- Head and neck extensors.
- Latissimus dorsi, pectoral and deltoid muscle groups.
- Elbow and wrist extensors.

Exercises that the patient can practice in their wheelchair should be included in the programme so that they can do further work when they have a spare time.

Wheelchair and other activities

The patient should be encouraged to push at least an extra mile a day in their wheelchair. This will be even more beneficial if some of it is uphill.

Swimming is the best all round exercise and if there is an accessible pool, the patient should use it. Hydrotherapy is also useful if it can be arranged.

Review

A full reassessment of the patient should be done following the agreed period of pre-brace training and their suitability reappraised.

Although it may be disappointing for the patient to do further exercises, it is much better than trying to train someone who is not fit, and may have difficulty when walking.

Section 3

Effective use of the ARGO comes with an understanding of how each feature works and following a few simple checklists for success.

Explaining how the ARGO works

Before fitting the ARGO to the patient, take time to explain how the brace works. Only when the patient is fully trained in the procedure and sequence for standing and sitting will it be time for them to try it for themselves.

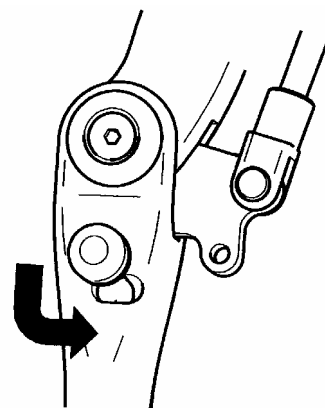
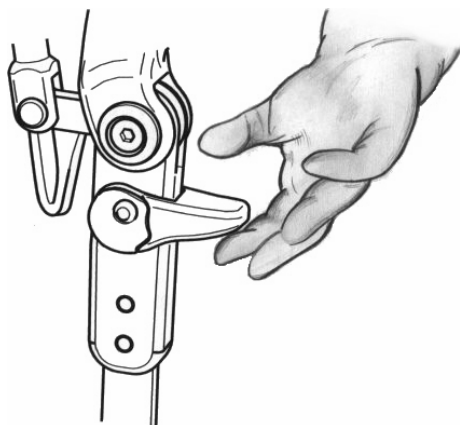
Walking

With the knees and hips extended and locked, show the patient how the action of the hip driving cable makes one hip extend when the other flexes. This is the reciprocating action from which this brace gets its name.

Sitting with manual knees (ARGO 25 and 60)

- Unlock the hips by:

Pulling up “duck” levers on the ARGO 25



Pushing down and then back the levers on the ARGO 60.

- Show how this disconnects the hip driving cable and allows both hips to flex at the same time.
- Show how pushing the lever arms on the knee joints allows the knee joints to flex.

Standing with manual knees

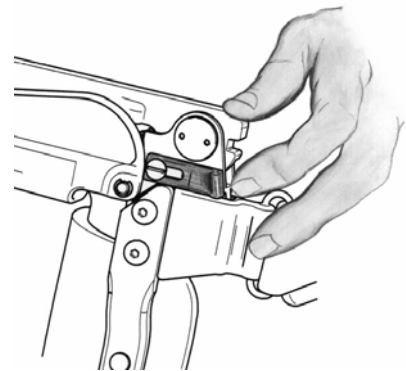
- Reset the hip levers so that they are free to engage automatically when the hip joints are extended.
- Straighten the knees and note that the locks are heard to “click” into lock.
- Fully extend the brace into a locked standing position.

Sitting with assisted knees (ARGO 60 and 90)

- Unlock the hips, showing the patient that it is necessary to move the lock levers down and then back to hold them in the unlocked position. Show how this disconnects the hip driving cable and allows both hips to flex at same time.
- To show the action of the knee locks and the gas spring, it is best to stand facing the brace putting your feet over the feet of the AFOs. Then, with the hips unlocked and the brace held by the thoracic bars, flex the hips. Show the knee lock cables pulling on the knee lock levers and then push the brace down into the sitting position.
- When the brace is in the sitting position extend the hips and lift the thoracic bars slightly the automatic knee locks will prevent extension of the knee.

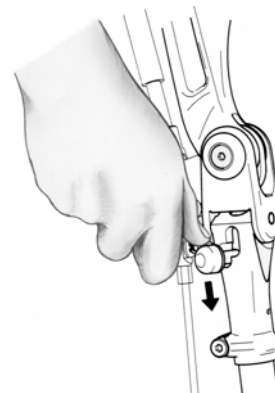
Sitting knee locks (ARGO 60)

On ARGO 60s fitted with manual sitting knee locks, and with the brace still in the sitting position slide back the manual locks and show that flexing the hips will not unlock the knees.



Hip abduction locks (ARGO 60)

On ARGO 60s fitted with abduction locks show how further downward movement of the hip lock levers opens the lock and allows hip abduction. Show how moving the leg back to the normal position automatically re-engages the abduction locks.



Standing with assisted knees

- Move the legs inwards to engage the abduction locks where fitted.
- Unlock the sitting knee locks where fitted.
- Move the hip lock levers forward so that they are free to spring upwards.
- Flex the hips forward, showing how this unlocks the knees.
- Lean the brace forward and raise the thoracic section keeping the hips flexed at first to avoid re-engaging the knee locks and then extending the brace. The gas springs will extend the knees and push them into full extension when they will lock automatically. The hips will also lock automatically when they are extended.

No one can ever be truly independent in walking if they are unable to get from sitting to standing and return to sitting unaided. Learning the following checklists will maximise success with the ARGO.

Standing up check list

- ◇ Move legs inwards to engage abduction locks (where fitted).
- ◇ Unlock the sitting knee locks (where fitted).
- ◇ Unlatch the hip lock.
- ◇ Stand up.
- ◇ Check the hip locks have engaged by extending the hips.

Sitting down check list

- ◇ Unlock the hips and latch the lock levers.
(latching is automatic on the ARGO 25 “duck” levers).
- ◇ Sit down.
- ◇ Set the sitting knee locks if required (where fitted).
- ◇ Release the hip abduction locks and abduct leg (where fitted).

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Section 4

With the patient fully fit and being thoroughly familiar with how the brace works, now it is time to start using the ARGO.

Training to use the ARGO

Putting on the ARGO

- To start with patients may prefer to put on the brace on a bed or plinth.
- The brace is laid beside the patient who should sit with their legs stretched out.
- One hand is placed across the brace at hip joint level and the patient lifts themselves into the ARGO keeping the trochanters level with the hip joints of the ARGO.
- The feet are lifted into the AFOs and the straps fastened, ensuring that the heels are pressed down into the AFO.
- The patient moves to the end of the bed and unlocks the knees. The legs can now be swung over the edge of the bed and an upright sitting position adopted.
- The ARGO hips can be unlocked and the thoracic section pulled up to the patients chest and the thoracic and abdominal straps fastened.

With practice patients will find that some methods of putting on the brace and taking it off are easier than others and will often devise their own way of doing this. A feature of the ARGO is that the patient can put them on over their head while they are sitting and then put their feet into the AFOs.



In the case of assisted knee ARGOS, the knee lock cables join the hip and knee joints and therefore they will flex together.

Once seated it is possible to extend the hip joints (taking care that the knee cable is free to move).

However, if the patient needs to lean forward they will need to loosen the thoracic and abdominal straps.

Some patients prefer to sit the brace in the wheel chair and lift themselves into it. This method is particularly suitable for patients with extensor spasticity who may find it difficult to sit with their legs outstretched.

The ARGO may also be put on with the patient sitting over the edge of the bed.

Learning to stand up in an ARGO with manual knee locks

- Push down the “duck” levers (ARGO 60) or unlatch the hip lock levers (ARGO 60) so that the hip locks are ready to engage
- While still sitting, manually extend the knees until the knee locks engage.
- Push up on the walking aid and extend the hips until the hip locks engage.

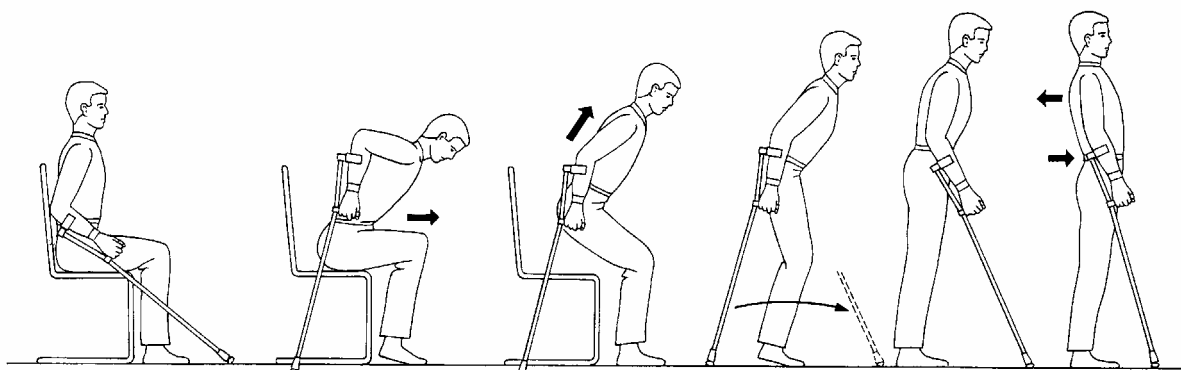
Learning to stand up in an ARGO with assisted knees

- The patient will be safer and more confident if training to stand up begins in the parallel bars.
- The patient should sit on the edge of the seat with their feet firmly on the floor and their trunk and hips flexed to put their weight slightly in front of their feet when they start to rise. At first it will be easier if the seat is fairly high, but remember to ensure that the feet are firmly on the floor.
- Where abduction locks are fitted the patient must check that the locks are engaged by moving the legs inwards. The sliding manual knee locks must be unlocked (where fitted).
- The hips lock levers are unlatched.
- The patient flexes the hips to unlock the automatic knee locks.
- The patient pushes themselves up on the parallel bars, keeping their hips flexed at first to prevent the knee locks from re-engaging. It is important that patient is pushing on the bars rather than pulling, as it will not be possible to pull on a rollator or crutches.



A common problem at this stage is to extend the hips too quickly. The patient will then be unable to stand and have to return to the sitting position before making another attempt. With practice and careful teaching, the majority of patients will be able to accomplish this manoeuvre. For those who cannot it is possible to remove the automatic sitting knee locks in the ARGO 90. Please consult your ARGO supplier for more information on this process.

- When the patient is upright they must ensure that the hip locks engage by giving a full extension of the hips. With practice the patient will be able to tell when the hip and knee locks are properly engaged. At first the therapist must check the locks before the patient starts to walk.
- When the patient is proficient at standing up between the parallel bars they can try with the rollator or crutches.
- The method for standing with a rollator is similar to that used for the bars, however it is important to have the rollator set at the correct height for the patient.
- The best height will be so that the patients elbows are not excessively flexed when trying to stand but the handles are not too low when the patient walks. In practice this adjustment is a compromise and some experimentation may be necessary during training before the best setting is found.
- The rollator should be placed close to the patient so that it does not tend to tip towards them when they try to stand.
- When standing up with crutches the technique is more difficult to learn. The patient starts to stand with the crutches slightly behind them, lined up with the greater trochanters, and then the crutches must be moved forward quickly as the upright position is achieved.



Learning to sit down

- To sit down the patient unlocks and latches each hip lock in turn, supporting themselves with their other hand on the crutch, rollator or parallel bars. Pull up the Duck Levers (ARGO 25) or undo the hip lock lever and latch in position to free the hip flexion lock.
- The hip locks can only be undone when there is no flexion load on them. It will often be necessary for the patient to rock themselves back and forth slightly to ease the load on the locks while they press down on the hip lock lever to release it. When there is no flexion load then the locks will move easily. This may be a particular problem with patients who have some hip flexion contractures, however with practice it should be possible to accomplish this without difficulty.
- Where hip abduction locks are fitted it will be necessary to relieve any adduction loading on the hip joint as well as the hip flexion load before unlocking the hips. This may mean that the patient has to rock sideways as well as back and forth before the hips can be unlocked. Although a little more complex this will become easier with practice.

Patients with different length legs or spinal problems may apply a continual adduction load to one hip and so may it difficult to operate the levers.



These patients may be unsuitable for a brace with an abduction lock and you may need to consider converting the brace to a non-abduction version.

- Using the walking aid for support, the patient leans forward and lowers themselves onto the seat. Where the ARGO is fitted with assisted knees the knees will automatically unlock and flex at the knee. Where manually operated knees are fitted they should be unlocked when the patient is seated.

Using ARGO 60 abduction locks

- The abduction locks are operated by the same lever as the hip locks and can only be used when the hip locks are undone.



The patient should never attempt to abduct the leg whilst still standing, since they will be in an unstable position and may fall or damage the lock mechanism.

- While sitting or laying down the hip lock lever can be pushed down and the leg manually abducted.
- The abduction lock will re-engage automatically when the leg is returned to the normal position.

Using ARGO 60 sitting knee locks

- Check that the automatic sitting locks are engaged by lifting the thigh with one hand and extending the knee against the lock with the other (leaning forward too far, will unlock the automatic knees).
- Slide the catch fully forward.
- The knees will now be locked.
- To unlock the knees, pull the catch back to its original position.



It is not possible to stand up when the manual knee locks are engaged. The locks may be damaged if this is attempted. Always check that the manual knee locks are disengaged before trying to stand.

Pad and strap adjustments

- ◇ The abdominal and thoracic straps should be adjusted to bring the thoracic bars central on the trunk.
- ◇ The back strap must fit tightly as the forces to swing the leg are generated by the patient pushing back on this strap.
- ◇ The hips must be in an extended position. The shaped gluteal pad fits around the gluteus maximus and can be adjusted to extend the hips and prevent a flexed posture.
- ◇ Patients with high lesions (C7-T4) tend to have a large lumbar lordosis and a protruding abdomen. Extra straps and pads should be used to provide the correct abdominal support.

Learning to balance

Before the patient learns to start walking they must learn to balance and have confidence in the brace.

This should be done in parallel bars, which have been adjusted to the correct height, and if possible the correct width. It may be necessary to re-adjust the brace from the first fitting strap settings and any shoe rises may also need adjustment to achieve a well balanced position.

If the patient falls to one side:-

- ◇ check that the hip joints are at equal angles
- ◇ check that the AFOs are set at equal angles 50 -100 mm apart at the heels and angled out by 5-8 degrees if possible
- ◇ make sure that the thoracic bars are not pushing the patient to one side.
- ◇ if the legs are different lengths then an insole should be fitted to the shorter side or if greater adjustment is needed extra thickness added to the sole of the shoe.

If the patient tends to fall forwards or backwards:-

- ◇ check that the patient has a good upright posture and if necessary adjust the straps to achieve this.
- ◇ add wedges to the shoes either as insoles or as a build up to the soles.

Confidence

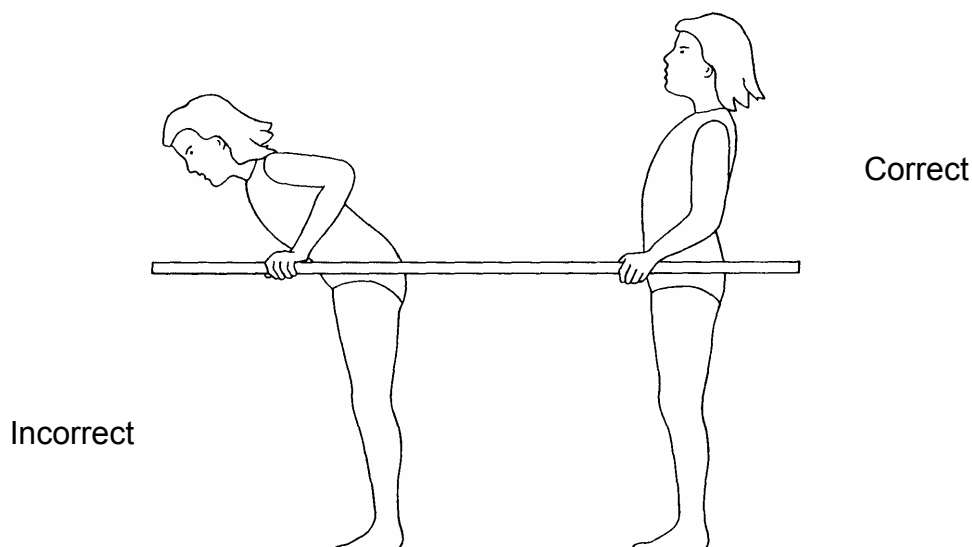
At first the patient may be reluctant to let go of the bars. Walking training should not start until they can stand independently for periods of up to one minute.



Patients who have good balance will walk better, so do not by-pass balance training just because the patient is keen to start walking.

Ball games in the parallel bars are a good method for learning balance. Here the patient feels secure and can hold on if balance is momentarily lost.

The most important element in balance is that the patient learns to maintain an extended posture. Leaning forward on the arms is very tiring and will make walking hard work.



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Section 5

The walking method is the same throughout the range of ARGO products. With practice the patient will progress from bars, to rollator to crutches.

Walking training

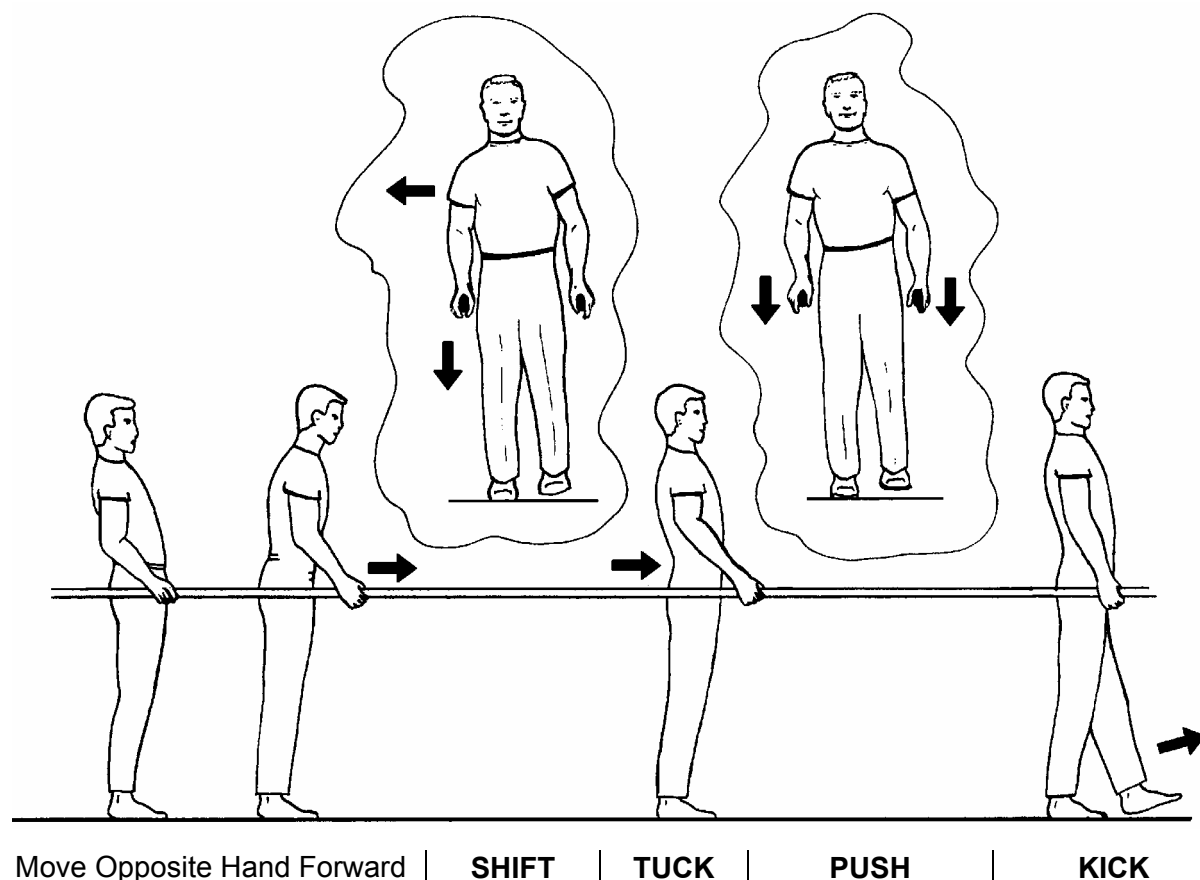
It is most important that a good gait pattern is established at the outset and that bad habits are corrected before they become fixed in the patients mind.

Walking between parallel bars

The walking action between parallel bars starts from the normal standing position.

To first move their left foot the patient should:-

- ◇ Move their right hand forward
- ◇ **SHIFT** their weight by leaning forward and to the right so that their left foot is clear of the ground.
- ◇ **TUCK** their bottom in by extending the trunk and then,
- ◇ **PUSH** down with their arms,
- ◇ **KICK** - the action of the cable will swing the left leg through.



Move Opposite Hand Forward | **SHIFT** | **TUCK** | **PUSH** | **KICK**

Then to step through with the right foot:-

- ◇ Move their left hand forward
- ◇ **SHIFT** their weight by leaning forward and to the left so that their right foot is clear of the ground.
- ◇ **TUCK** their bottom in by extending the trunk and then,
- ◇ **PUSH** down with their arms,
- ◇ **KICK** - the action of the cable will swing the right leg through.

Particular attention should be paid to the following points:-

- It is important that the patient should have a strong swing through action.
- With very young children it will be necessary to move them passively through the gait pattern until the method is understood.

Make sure that the patient avoids the following faults:-

- Pulling rather than pushing on the parallel bars - it will not be possible to pull on crutches or rollators.
- Excessive hip and trunk flexion - this makes walking hard work and strains the hips and shoulders.
- Excessive sideways movement to clear the swing leg - rather than sideways and forwards movement.
- Leaning backwards to produce the swing action.

If mirrors can be set up so that patients can observe themselves walking it will help them to improve their own gait pattern.

During gait training the patient should be taught how to walk backwards, sideways and how to turn round in the brace.

Choosing between crutches and rollators

The gait pattern for crutches and rollators is different and it will be easier to train the patient if it is known which walking aid is to be used as early as possible.

- Crutches will provide the fastest and most efficient gait and will be more versatile for manoeuvring and walking on uneven surfaces, whereas a rollator will provide better stability and security and will make standing and sitting much easier.
- The rollator is slower and less efficient because it is necessary to pause at each stride to move it forward.

Many patients will progress from parallel bars to rollator and then crutches. If the patient wishes to use crutches eventually, and is a good candidate, it may be advantageous to progress to crutches direct from the parallel bars as the walking pattern is the same four point gait.

Walking with a rollator

When the patient can walk and balance well in the parallel bars, training can start with the rollator. The choice of rollator is important:

- It should be deep and wide, with 2 wheels at the front but feet at the back.
- There should be no crossbar at the front below knee height as this will restrict stride length.
- The handles should extend as far back as the feet of the rollator to assist with standing up.
- The weight of the rollator is not important but it should move easily over carpet.

The gait pattern is slightly different with the rollator because it must be moved forward after each step. It will be very helpful if the members of the patients family can be involved with the training and shown the correct gait pattern so that they can help the patient at home. Again, the use of mirrors will help the patient improve their gait pattern.

Walking with crutches

If the patient intends to use crutches and is a good walker in the parallel bars it may be possible to bypass using a rollator.

Good balance and confidence are required to walk with crutches and these can be improved by first using one crutch with the other hand on the parallel bars. Practise by using alternate hands.

Make sure that the patient does not lean too far forward as this will restrict stride length and be very tiring for the arms.



To reduce the risk of the crutches slipping RSL Steeper recommend the fitting of non-slip end fittings to the crutches.

Factors affecting gait training

It is very tempting to try to rush gait training, every effort should be made to **avoid**:-

- walking before a good standing balance is achieved;
- moving onto crutches or a rollator before the patient is not only confident but also competent in the parallel bars.

Trying to do too much too soon will lead to disappointment. If the patient finds the gait training more difficult than they expected they are likely to become dispirited.

Similarly, if they had too high expectations of what was achievable in the brace, they will also abandon walking quickly.

Leg length discrepancy or asymmetrical contractures can lead to difficulty in bringing one leg through. A shoe raise on one side may be helpful.

Gait faults may make walking more difficult and should be corrected by returning to training between parallel bars.

Getting around, inside and out

Once the patient has mastered getting around on the flat, do ensure that they can manage on carpet, especially where this fitted at home.

Ramps and gradients should also be attempted using the four point gait pattern although for slopes patients may have to revert to a “swing-to” or “swing-thru” gait.

Ensure patients are happy getting in and out of doors, including sliding doors. This is most important for patients who are using crutches rather than a rollator.

Steps, kerbs and stairs

Attempting steps, kerbs and stairs takes a lot of confidence and good upper body strength. Small steps and kerbs should be tried first. A swing gait is used for steps and crutches may be used. Very shallow wide steps may be attempted with a suitable rollator.

Section 6

Before the patient is ready to walk away from the clinical team for the first time some final points should be covered to build on the training period.

Continuing support

Clothing

In the early stages of training it is easier for the patients to wear track suit trousers and trainers. Laced shoes are preferable to Velcro® fasteners which will not be as supportive. With an appropriate choice of sizes and styles the ARGOs can successfully worn under clothing for a much better appearance.

Getting in and out of a car

Cars vary considerably in many features and a suitable method will generally have to be worked out between patient and therapist. The following notes may provide a good start point.

Getting into the car:

- With the car door open, the patient should stand with their back to the side of the car seat.
- Release the walking aid. (At this point crutches may be rested against the door frame for later transfer into the car).
- Holding on to the car door and back of the seat, unlock each hip in turn.
- Using the car door or door frame and the back of the seat for support, lower slowly onto the seat.
- Turn to face forward by lifting one leg at a time into the car.

Getting out of the car:

- Position the walking aid in a convenient, but not obstructive, location.
- Lift each leg, one at a time, out of the car until facing sideways on the car seat.
- Holding on to the back of the seat and the car door or door frame, the patient should pull up into the standing position and extend the hips to lock.
- Transfer hands to the walking aid.

Preparing the patient for discharge from the clinic



It is essential that the patient, and in the case of children, the family or carers, be thoroughly advised of the significance of pressure sores. Detailed instruction should be given on how to check pressure areas each time the brace is removed.

- The patient must be advised never to try to adjust the brace themselves. If they think that there is a problem with the brace they must consult the orthotist.
- The patient should check their skin for pressure areas after they remove the brace each day. If any red marks have appeared, the time taken for them to recede should be noted.
- The patient should be encouraged to wear the brace every day, for as long as is practical.
- If they have it on all the time then they will find more opportunities to get up and walk. If this is not possible then a certain amount of time should be set aside each day for walking. Missing one or two days a week is acceptable but regular walking is essential to maintain the fitness to be able to do it easily.
- Walking should be seen as an essential part of the day, not a chore to be endured.
- Maintaining an exercise programme is also important and one should be worked out to suit the patient prior to discharge from the clinic.
- The patient should be advised to try to keep to their present weight as gaining or losing weight could alter the fit of the brace and make adjustments necessary.
- Issue the patient with the user information sheet supplied with the ARGO.

Review clinics

The physiotherapist and orthotist should hold joint follow up clinics. The patient should be reviewed after three months in the first instance and then six monthly unless problems arise in the meantime.

Spinal posture, technique, speed and safety of walking should all be checked prior to assessment of the patient and brace by the orthotist.

A follow up assessment should be carried out by the therapist and should include the following questions;

- ◇ Is the brace worn every day?
- ◇ How long is the brace worn for each day?
- ◇ What difficulties is the patient experiencing?
- ◇ Are they having any pain or problems with pressure areas?
- ◇ Has the patient gained or lost weight?
- ◇ What has been the effect on any spasm (if any)?
- ◇ Has there been any change in bowel or bladder habits?

A specific follow up form may be useful.

END