

IT FEELS GOOD TO STAND: COMMENCING STANDING AND AMBULATION

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This workshop addresses the most basic steps to commence ambulation. The focus is on the non ambulatory client who spends his or her day sitting in a wheelchair, with whom there may not have been a priority to achieve standing, either because of the complexity of their condition, complications with their rehabilitation, or expectations from the individual, family or medical personnel

Walking on two legs is a fundamental part of being human. As well as the obvious benefits of mobility, we can access our whole environment and interact with others face to face.

Benefits of Standing

There are many benefits to standing, which are often talked about and well documented. Standing keeps the individual healthy even if there are no plans to move on to independent walking. From a musculoskeletal perspective, regular standing maintains and improves muscle strength, joint mobility, and more normal alignment of the whole body. The improved alignment may assist in reducing pain particularly in the back and shoulders. Exposure to standing may drive neural plasticity in those with neurological injuries. Relief of constant sitting, better alignment and improved circulation will assist in reducing the occurrence of pressure sores. Both the exercise and position involved in standing assist respiration. Not only does one have to breathe harder when standing or walking, but also one can actually fully expand ones lungs. Standing, and the trunk and pelvic movement of walking, promote bowel and bladder function. There is evidence of prevention of bone loss with regular standing.

In addition, the motivational value of walking cannot be underestimated. It is rare that you meet a non-ambulatory client who does not have the goal of walking. Walking, even with assistance can make individuals who spend the rest of their day in a wheelchair feel human again.

Standing and Walking

Assume that until we achieve independent standing on both legs, we will not achieve acceptable gait. Ideally standing should be safe, relatively effortless, and carried out at an automatic level. In general, if an individual has not been standing for a while, placing a walker in front of them and expecting them to get up and walk will not be successful. In addition allowing our hemiplegic clients to stand and walk with a typical hemiplegic pattern will not allow them to meet their goals. Preparation and work on the elements of standing and gait are necessary.

Alignment and Seating Posture

For an individual who is sitting in a wheelchair for the majority of his day, seating has a huge impact on his function and the eventual ability to leave the wheelchair behind. Seating should be set up to promote postural control.

Pelvic position is paramount. Ideally the pelvis should be stable to allow the upper body to move in the most efficient manner.

If the seating is in a significant amount of dump it will inhibit trunk activity; as while this posture is secure it will not facilitate normal trunk activity in sitting. Gradually reduce the dump as more trunk stability is facilitated in therapy. This will stimulate more trunk activity. For the first day or two the client may report increased fatigue, you may have to readjust a little but it means you are on the right track. Reducing the dump will also allow the client to move forward in the chair to stand more easily.

The same is true for the position of the backrest. An individual with poor trunk stability will feel more comfortable in a reclined position. This again inhibits trunk activity and prevents the individual from experiencing forward movement of the trunk, a movement necessary for sit to stand. If seating is reclined, gradually move it to a more upright position as forward movement is introduced and the client becomes more comfortable and balanced.

Activity In Chair

With the appropriate seating the client should have sufficient pelvic stability to allow forward and backwards movement and to experience movement within the base of support. The client should be encouraged to move his upper body while in the chair during normal activities in preparation for standing. As their trunk and upper limb mobility improves within the chair they will gain better trunk alignment and control in standing.

For many, the only independent mobility is through self-propulsion of a manual chair. Often, when hemiplegia is involved, this is achieved through propulsion with one arm and one foot. This requires considerable effort and promotes a flexed posture, asymmetrical activity, and frequently, increased tone. If self-propulsion of a manual wheelchair is necessary seating should provide adequate support to the pelvis and trunk. If there is excessive flexion, asymmetry or tone this will prevent progress with standing, transfers and walking.

Preparation For Standing

Many clients who have been immobile for extended periods have spent significant time in a reclined position. They are not only unfamiliar with leaning forward over their feet but are quite fearful in this position. There is frequently weakness of the abdominal muscles and pelvic muscles. In these clients initial steps for increasing mobility should focus on trunk activity and mobilization of the trunk. Plenty of support from in front is needed to reduce anxiety. The focus of treatment should be to move the centre of gravity over their feet.

Lacking strength is not good reason to not stand, as the best way to strengthen the muscles is to use them for standing. Lacking range of motion, particularly in the hips, knees and ankles may prevent standing, and should be addressed with therapy as part of preparation. Clients who have not stood for a long time may require medical clearance in terms of bone density.

Trunk

Trunk stability is of highest importance as trunk stability provides a foundation for all movement. Without trunk stability, righting and equilibrium reactions, the client is unable to position himself to start to stand, initiate movement into standing, or maintain standing.

Having poor trunk stability is one of the biggest obstacles to standing. The importance of trunk stability cannot be emphasised enough. Often the trunk has been overlooked during therapy in favour of strengthening legs or arms; this is often where the client will identify weakness.

Trunk alignment is crucial. On assessment it is important for the therapist to ask if the client is able to extend the trunk or are they in excessive kyphosis? Is the individual able to achieve symmetry between the left and the right sides of their body? If any problems are identified that will affect the ability to stand these need to be addressed in preparation for standing.

In addition to manual techniques for addressing trunk control, clients may be given activities that allow them to become familiar with moving forward in preparation for sit to stand and standing including leaning forward in sitting to push a therapy ball, and reaching down to their own feet.

In an individual with hypotonic musculature, excitation of muscle tone will be required to gain sufficient muscle control of the trunk. This can be achieved by facilitating trunk extension just prior to standing.

Lower Limbs

Assess the client with their shoes and socks off in sitting and standing. Do they accept a base of support through their feet or are they pushing the floor away?

A hemiplegic foot that has not been handled can become hypersensitive. Conversely a diabetic foot may have peripheral neuropathy and lack sensation. Both should be thoroughly assessed and if necessary addressed with handling and activities to improve contact with the floor.

In an individual who has shortening of the calf or who has high tone causing them to stand on their toes, bringing the floor up to the heel by placing a small rolled towel under the heel will assist in making contact with the floor. Standing will lead to lengthening of the calf or reduction in tone so that gradually the towel is not needed.

Activities to strengthen the legs should be done preferably in standing rather than sitting. Approach standing as a pattern of muscle activity rather than as a quadriceps exercise.

Equipment for Standing

Use of a standing frame or tilt table is often seen as an end in itself, but standing frames and tilt tables can also be used to transition an individual from non-standing to standing status.

A tilt table is usually chosen for early use when getting someone upright for the first few times. It has the advantage of positioning the client in supine before standing, and providing a slow transition from supine to standing. It can be a difficult transfer onto. Because there is nothing more than a strap in front of the client once they are standing it may be frightening for the client. Consider using visual blocks once in standing, for example a high table, as it can be disconcerting to stand with only support from behind.

Standing frames are often considered devices for standing the spinal cord injury population as their only means to stand. But they also have a rehabilitative role in the population starting to achieve standing. You may choose to use a standing frame for an individual who would otherwise require two or three people assisting to achieve a good alignment, or for an individual who requires hands-on assistance and whose standing time in therapy can be supplemented by additional time in a standing frame.

A standing frame should allow the therapist to position the client in standing and achieve good alignment at the head, sternum, pelvis hips, knees and ankles. The transition from sitting or lying to standing should require little effort and feel comfortable and safe. Ideally the effort required to position the client in the standing frame should be minimal and once they are positioned they should feel stable and able to move their upper limbs to do tasks in standing. There are many different standing frames available. The one you

select for your client will depend on his ability, physical dimensions and reaction to standing. For example, an individual who is very anxious in standing may require a more substantial, closed-in design.

Once standing has been established, the therapist can then go on to remove some of the supports and allow the client to take over control, gradually gaining strength in the trunk, hips and lower limbs, moving towards standing independently.

Facilitating Sit to Stand

Symmetry is very important initially: if one stands with an asymmetrical pattern one will have an unbalanced posture and muscle activity, adversely affecting the walking pattern. Literally they are setting off on the wrong foot. Many clients are taught to stand by placing their hands on the chair armrests. This makes it very difficult to move the centre of gravity forwards and promotes using the abnormal pattern of initiating standing with trunk extension.

Transfer into standing using a normal pattern of movement, this will set the stage for aligned standing. In standing one needs to achieve righting and balance reactions

You may initially need to provide support in front or to the side with a high plinth. It is preferable to use stable tables for both safety and client confidence.

A height adjustable plinth can be brought up to support the buttocks once in standing and assist with gaining alignment.

Preparation for Walking

Once standing has been established one can progress to movement within standing, promoting balance and weight transference. Teaching weight transference is a fundamental part of working with stroke, brain injury and incomplete spinal cord clients, but is basic for all individuals who are not used to being on their feet. A good way to start is by placing the client up against a wall. They may require support on one or both sides and the therapist can assist and facilitate movement by sitting in front of the client. From here you can facilitate quadriceps control, weight transference from one leg to the other, exploration of balance and stepping by bringing the trunk away from the wall. It is an excellent way to introduce first independent steps away from the wall.

Walking

Walking tends to happen spontaneously for an individual who is ready. How you chose to support this depends on your physical relationship to the client (height differences, weight, stability) and preference. Many clients do well with facilitation and support from in front, which provides a sense of blocking from falling and easy communication. You may chose to “pattern” movement by facilitating from behind keeping the client close to your own movement, this works best when you are of similar height. The therapist may also support from the side, holding the client under the elbow and over the pelvis. This works better for individuals who are ready to walk independently.

Balance training is an important next step. The client must be able to respond to being off balance and not rely on visual compensation. Facilitation of trunk reactions should be commenced in sitting using reaching, weight transference to the side and movement of the legs on the body. Standing the client and bringing them to the limits of their base of support to facilitates stepping reaction. Stepping to either side, and cross-stepping activities promote weight transference and balance. Activities that require them to use their vision

while maintaining standing are useful, such as throwing and catching, kicking, and simple games. Walking on rough ground (using mats over an uneven surface) can prepare for outdoor walking.

Using Equipment and Walking Aids

As a general rule I do not introduce walking aids until the client is able to maintain standing and take a few steps with assistance. It is better to facilitate walking than walking aid usage, and walking aids can inhibit return of more normal balance reactions. Once the client has a little balance and is able to step you may introduce a wheeled walker for functional use. A wheeled walker provides not only assistance for balance by increasing the base of support, but also provides a means of carrying objects, and a mobile seat for resting. There are also other walker options: platform and high support walkers, and reverse walkers, that are designed to facilitate postural alignment, balance, and components of gait when compared to forward walkers.

When canes are introduced, look primarily for improving balance in the neurological population, not reduction of weight through a limb (as may be the goal for an orthopaedic client). Rather than using a traditional height to allow weight bearing through the cane, consider raising the cane to provide only balance support. This will discourage leaning to the cane side, with an asymmetrical posture. For this reason quad canes or tripods are not recommended.

If there is difficulty with ankle stability, or insufficient activity in the foot bracing or splinting may be needed. This may be a temporary measure to facilitate activity or for long-term use. The most common splint used is an ankle foot orthosis (AFO), which holds the ankle at 90° to gain better swing through phase of gait. Braces that provide lateral and medial ankle stability may be more appropriate in assisting (such as an *Air-Cast* or similar) and will not contribute to hyperextension of the knee.

Summary

Standing and walking provide enormous benefits to individuals. Even individuals who never progresses to independent walking will find life easier and more enjoyable if they are able to walk with another person, allowing them greater access to activities and greater choice. For those who can achieve some independence the reliance on caregivers is reduced and they have fewer secondary problems to their original diagnosis and a better quality of life.

Speaker Bio

Beverley Jones graduated from Pinderfields College of Physiotherapy in the UK in 1989. After working in the UK she moved to Canada in 1991. She worked with neurological clients in a variety of in-patient and out-patient hospital settings, and then moved into private practice in 1996. In 1999 she began her own private practice, which became Collins & Jones, Physiotherapy. She works in the community predominantly with brain injured, spinal cord injured, and CVA clients. Beverley is Bobath-trained at an advanced level.