Let's Get It Clear No.8
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Foot positioning - When to put your best foot forward

Over the years I have enjoyed listening to, and learning from, inspirational presenters from around the world - these have included Bengt Engstrom, Bart Van der Heyden, and others. Invariably these presentations have been overviews that have looked at seating from the needs of all parts of the whole person, not just the pelvis. For normal everyday functionality, the position of our head is critical - for breathing, eating, hearing, balance, seeing, communication, etc, so why is this article looking at the position of the feet?

As in the spiritual song 'Dem Bones', every bone in the body is connected to the next, or at least that's the case for most people. So how does this relate to seating? Most people who have reduced mobility have shortened hamstrings. (The hamstrings are a set of three muscles used, inter alia, for bending the knee. They mainly attach around the top of the lower leg at one end, and the lower part of the pelvis at the other.) People with reduced mobility are often in wheelchairs, with the foot supports way out in front of the casters (so that the casters can rotate unobstructed).

Toe bone connected to the foot bone
Foot bone connected to the heel bone
Heel bone connected to the ankle bone
Ankle bone connected to the shin bone
Shin bone connected to the knee bone
Knee bone connected to the thigh bone
Thigh bone connected to the hip bone
Hip bone connected to the back bone
Back bone connected to the shoulder bone
Shoulder bone connected to the neck bone
Neck bone connected to the head bone
Now hear the word of the Lord

From Dem Bones, a spiritual song by Johnson and Johnson

The consequence of this is that the feet, having been moved forward, will link through the lower leg, then through the hamstrings to the pelvis: with shortened hamstrings this will pull the pelvis into a posterior tilt, which in turn leads to kyphotic curvature of the spine (Figure 1).

For the person to be able to raise their head for normal function, this then requires the neck to be hyperextended, or else the head drops down, visual contact is lost, drooling starts, and dignity is lost. The hyperextended neck is the position used for mouth to mouth resuscitation, since it opens up the airways - not a good position to be in when eating and trying to swallow down the neighbouring pathway! So the foot bone does connect eventually to the head bone, and having the feet in the wrong position has a major knock-on effect on the head's position.

Further to the above, and under normal circumstances, where we place our feet relative to our head, and to our pelvis, varies according to what we are trying to achieve. When eating a meal, we like our feet back, and our heads forward over the plate. When sitting on a toilet, this is ideally a similar position, to encourage rectal reflexes. However, when typing on a keyboard, we like our feet and head in a neutral position. In contrast, when watching TV, we probably like our feet out in front, severe posterior pelvic tilt, and our heads back.

Thus, to those of you designing or prescribing wheelchairs, please do pay attention as to where the feet can and will be placed for optimal functionality, and avoid placing clients into a position where a resulting kyphotic spine is an inevitable consequence, and where the foot position prevents normal activities. The same applies to the design and prescription of comfort/recreational seating.

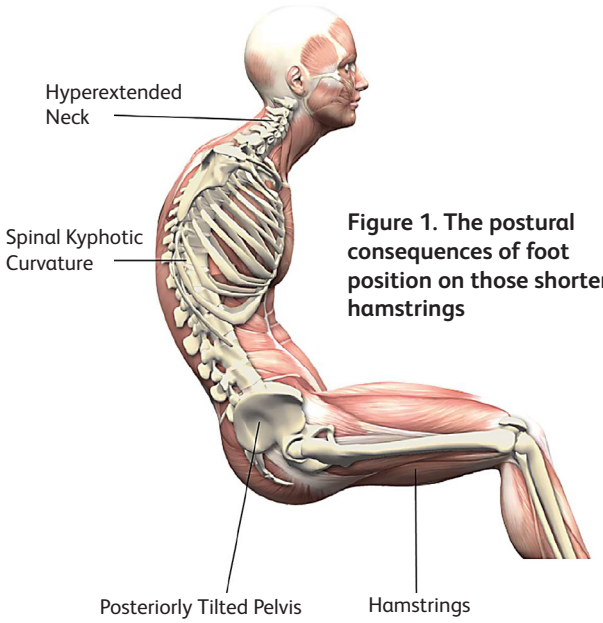

Figure 1. The postural consequences of foot position on those shortened hamstrings

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