SHORT SEATED VS LONG SEATED POSITION AS RELATED TO PRI NEUROLOGICAL REPATTERNING

by Ron Hruska, MPA, PT

The word “repatterning” means self-directed neuroplasticity. It requires methodology that is personally acceptable, explainable and emotional. To change physical and psychological patterned reactions to events or experience, involves a neurological process of implementing an intermittent, very weak ‘trigger’, while experiencing a positive and safe situation. The ‘trigger’ has to be weak so that negative emotions do not alert mid brain threat.

Regardless of the position, short seated or long seated, both the ischial seats and either the heels or entire bottom of the foot are processing desirable thoracic twelfth vertebral extension. These positional states enhance thoracic diaphragm costal expansion, while reducing the postural demands placed on the thoracic crural diaphragm’s attachments to the lumbar vertebral spine.

These two positions are non-threatening and are usually unfamiliar to most human resting states. Therefore, they are two good positions to introduce novelty for brain function acceptance of new movement memory and corollary integrated function.

The best frequency for overall cortical remapping and neurological repatterning is 6 Hz. These supportive, stable, PRI positions enable delta and theta relaxation, and thus more pleasurable states for re-referencing sense, without reintroducing engrained threatening patterned frequencies associated with upright, possibly imbalanced, sitting or standing.

32 Hz is the best frequency for gaining sense of ground; and 40 Hz is the best frequency for frontal lobe reprocessing. (The frontal lobes are important for voluntary movement, expressive language and for managing higher level executive function, such as planning, organizing, initiating, self-monitoring and controlling responses in order to achieve a goal.) Both of these frequencies influence the resonances of the body that are associated with memory of desirable thoracic repatterning, that should be enhanced when carried out in one of these two positions; simply because the upright head and neck are close to the ground.

They are good positions to establish pelvic and pleural decompression during respiration, or upon inhalation, while sense of gravity is experienced through the paired ilium bones and scapulae. Listening to soft 40 Hz binaural beats, in one of these positions enhances the sense of balance or somatosensory cortex in general.

A study done by Anke Karl helps demonstrate why the motor system may be dependent on the sensory system in regard to cortical remapping. The study found a strong connection between motor and somatosensory cortical remapping after amputation and phantom limb pain. The study assumed that somatosensory cortex reorganization can affect plasticity in the motor system because stimulation of the somatosensory cortex prompts long term potentiation in the motor cortex. The study concluded that reorganization of the motor cortex may only be subsidiary to cortical changes in the somatosensory cortex. This helps support why feedback to the motor system is limited and difficult to determine for cortical remapping, especially when one of the two legs we stand on, is not contributing to bilateral,

binaural, binocular or binasal bi-hemispheric integration of sense, which is what cortical resonant frequencies are built around.

Karl A, Birbaumer N, et al. Reorganization of motor and somatosensory cortex in upper extremity amputees and phantom limb pain. The Journal of Neuroscience. 2001 May 15;21 (10): 3609–3618.

There is also a close link between geometric or shape of the brain and brain function. Brain wave dynamics can become dominant, and therefore can reproduce numerous canonical spatiotemporal properties of spontaneous and evoked recordings.

Pang JC, et al. Geometric constraints on human brain function. Nature. 2023 Jun;618:566-574.

These patterned dominant recordings are usually associated with upright sitting or standing support systems that have very limited surface sense, simply because the somatosensory surface has been built off of the bottom of the feet and therefore limited sense. And in most cases primarily to one foot, even when both are on the ground. Therefore, both the shape (area) of the brain and the shape (area) of the ground one is sensing for neurological patterning or cortical mapping, need to be addressed if respiration in a standing position is difficult to reprogram polyarticular performance.

Short Seated Neurological Repatterning Advantages

1. Has many of the benefits of an active squat position, and because of its passive qualities, it is a good position for both inlet and outlet pelvis flow during thoracic diaphragmatic repatterning.
2. One of the most desirable positions to enhance spinal rotation below T8 and above L3, without losing control of both the support from the ischial bones, posterior iliums and plantar surfaces of the feet.
3. Allows inner surfaces of thighs to recognize and touch each other for contralateral abdominal facilitation.
4. Promotes mid thoracic posterior translation prior to or during arm reach.
5. Reduces tendency to supinate legs/feet and arms/hands during inhalation, and therefore enhances pelvis and thorax expansion as abdominal contents provide both pelvis and thoracic fulcrums.
6. Establishes unilateral abdominal compression and mid stance plantar sense.
7. Allows for isolation of unilateral zone of apposition without losing pelvis or femoral neutrality.

Long Seated Neurological Repatterning Advantages

1. Provides sense of heels. Great for those without good sense of heel strike or initiation of midstance activity.
2. Frees up femoral acetabular limitation, secondary to functional or structural ischium/ilium imbalance, through posterior foot, leg and hip ground support and guidance.
3. Provides upper extremity and head and neck opportunities by isolating inferior T8 from superior T8 function.

4. Activates all hip flexors that are more neutral femoral flexors so that the tensor fascia latae is not placed in a biased position to both flex and internally rotate the femur, as the primary hip muscle at ‘early pick up’.
5. Empowers anterior and middle gluteus medius.
6. Employs medial hamstrings and hip adductors as stabilizers during unilateral lumbar rotation (lifting one leg, moving one leg forward, unilateral abdominal contraction, etc.)
7. With feet and legs in neutral orientation, this position activates glutes during scapula function.
8. With heels on the floor and forefeet on a wall, and knees together, this position isolates eccentric abdominal function.
9. Generates spinal reflex activity responsible for lateral gravitational sense of mass alternation.