FREQUENTLY ASKED QUESTIONS

CLINICAL PRACTICE GUIDELINE TO IMPROVE LOCOMOTOR FUNCTION FOLLOWING CHRONIC STROKE, INCOMPLETE SPINAL CORD INJURY AND BRAIN INJURY

What was the purpose of the Clinical Practice Guideline to Improve Locomotor Function Following Stroke, incomplete SCI, and Brain Injury?

The purpose of the CPG was to evaluate available evidence of the efficacy of various physical interventions to improve walking function of individuals with a history of a stroke (CVA), motor incomplete spinal cord injury (SCI), or traumatic brain injury (TBI) of > 6 months duration. Access the publication here.

What were the populations under study?

Individuals with a history of a stroke, motor incomplete SCI, or TBI of > 6 months duration. Patients were defined as ambulatory.

What is moderate to high intensity gait training?

Moderate to high intensity gait (or walking) training is **large amounts of** structured and graded walking practice delivered at **moderate to high cardiovascular intensities** with targeted heart rate ranges of 60-80% of heart rate reserve or 70-85% of maximum heart rate.[1]

Will I harm my patient when delivering high intensity gait training?

Evidence: The potential for adverse events with high intensity gait training has been shown to be no greater than conventional therapy.[2-4]

Recommendations:

- When in doubt check it out! Gain medical clearance from the referring physician or cardiologist if there are concerns (e.g. multiple comorbidities, decreased exercise tolerance)
- Continuously monitor heart rate, blood pressure and oxygen saturation before, during, after exercise at a minimum
- Follow American College of Sports Medicine (ACSM) and American Heart Association (AHA) recommendations for safe exercise parameters

Should I be concerned I am causing orthopedic issues (i.e. pain, joint instability, musculoskeletal trauma) when doing high intensity gait training?

Evidence: There is negligible evidence in adults in acute-onset CNS injury that high intensity walking exacerbates pain.[5-7]

Recommendations:

- Utilize bracing as appropriate (e.g. AFO, taping for ankle inversion, Swedish knee cage)
- Modify upper body support and/or increase body weight support (BWS) if patient is experiencing musculoskeletal discomfort
- Patients should wear comfortable shoes for proper support

Should I be concerned about my patient's movement quality while performing high intensity gait training?

Evidence: Prioritization of movement quality during walking training can reduce the amount and intensity of practice, which are key training parameters to facilitate improvement in locomotor ability. Further, prioritization of movement quality does not appear to actually improve movement quality nor improve functional outcomes when compared to treatment strategies focused on the amount and intensity of practice. Evidence demonstrates improvements in walking outcomes regardless of movement errors during practice and that "perfect practice" does not lead to better outcomes. Additionally, data suggests that movement quality improves following high intensity gait training interventions even when quality of movement is not a priority of training. [8-14] These findings are consistent with motor learning literature that identifies the importance of trial and error practice in skill acquisition, and specifically patient recognition of movement errors and the subsequent altering of motor output to increase walking success.[15-19]

Recommendations:

- Prioritize intensity and amount of practice
- Allow errors in movement to promote motor learning

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What if my patient needs to work on activities like standing balance and transfers?

Evidence: High intensity gait training has been shown to improve non-locomotor tasks like transfers and standing balance, without their explicit practice. Further, larger gains in walking outcomes are observed with prioritization of high intensity gait training as compared to practicing non-locomotor tasks.[4,10,20]

Recommendations:

- Prioritize high Intensity gait training
- Monitor the effect of high intensity gait training on balance, transfers and other non-locomotor tasks

Why are body weight supported treadmill training and robotic-assisted training "should not" recommendations?

Evidence: It is important to remember that the recommendations of the CPG are applicable to patient populations who have some capacity to walk. Providing additional support through unweighting or robotics could potentially reduce the intensity of practice, a training parameter that is known to be critical. Body weight support devices or robotics may be indicated to allow for non-ambulatory patients to engage in high intensity gait training, although this population was not included in the CPG. [3,18,21,22]

Recommendations:

- Maximize the amount and intensity of work during sessions - don't provide assistance that is not needed!
- Avoid the use of body-weight support and robotics unless necessary for safe participation in high intensity gait training

What additional equipment could be required to perform high intensity gait training safely?

Recommendations:

- Heart rate monitor
- **Walking space or a treadmill**
- Safety harness system/devices **– may be** useful to ensure safety

What if I do not have enough help to deliver high intensity gait training?

Evidence: When patients are challenged with large amounts of intensive walking practice, the potential for imbalance and falling increases. Investing in a fall protection harnessing system can be helpful to optimize safety during sessions when additional support from a second person is not available. Rarely are three people required to deliver high intensity gait training, especially considering the lack of prioritization around movement quality. [15,19,24,25]

Recommendations:

- Refer to "how to" videos under the implementation section for more guidance.

Should I apply high intensity gait training in inpatient rehabilitation?

Evidence: The focus of the CPG was on individuals in the chronic stages following stroke, incomplete spinal cord injury, and traumatic brain injury however there is growing body of evidence that indicates high intensity gait training is feasible and beneficial for the sub-acute stroke population. [4,10,23,24] A CPG is currently underway for this patient population, more to come!

Recommendation:

- Refer to the "Intensity Matters" webpage for evidence in sub-acute populations.

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