

# Frequently Asked Questions about the Locomotion - Chronic CVA, SCI, TBI Clinical Practice Guideline

1. What was the purpose of the Clinical Practice Guideline for Locomotor Training?  
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](#).
2. What were the populations under study?  
Individuals with a history of a stroke, motor incomplete SCI, or TBI of > 6 months duration.
3. What is moderate to high intensity gait training?  
It is task specific and graded walking practice delivered at high doses (frequency and repetition) and at moderate to high cardiovascular intensities with targets of 60-80% of heart rate reserve or up to 85% of maximum heart rate.<sup>1</sup>
4. Will I harm my patient when delivering high intensity gait training?  
Evidence: High intensity gait training has been shown to be no more dangerous than conventional therapy.<sup>2-4</sup>  
Recommendations:
  - When in doubt check it out! Gain medical clearance from referring physician or cardiologist if there are concerns (e.g. multiple comorbidities, decreased exercise tolerance)
  - Continuously monitor heart rate, monitor blood pressure and saturation at pre/mid/post exercise at a minimum
  - Follow American College of Sports Medicine (ACSM) and American Heart Association (AHA) recommendations for vital sign ([link to vital signs parameter handout](#))
5. Should I be concerned I am creating orthopedic issues when doing HIGT?  
Evidence: There is negligible evidence in adults in acute-onset CNS injury that high intensity walking exacerbates pain.<sup>5-7</sup>  
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 back or hip discomfort
  - Ensure donning of comfortable shoes for proper support

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6. Should I worry about my patient's movement quality while performing HIGT?

Evidence: Prioritizing movement quality during walking training can reduce the amount and intensity of practice. Evidence demonstrates improvements in walking outcomes despite error augmentation during gait retraining. Practicing perfect or "normal" movement does not appear to improve movement quality or outcomes over strategies that do not focus on or emphasize. Selected data suggest improved movement quality with HIGT even when kinematics is not a concern during training. <sup>8-12,13,14</sup>

7. Does walking practice performed with "normal" kinematics lead to better outcomes?

Evidence: Data shows that "perfect" practice does not lead to better outcomes. Motor learning literature supports the need for error and patient engagement in identification of error and subsequently altering motor output. <sup>15-19</sup>

8. What about the practice of standing balance or 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 HIGT as compared to practicing non-locomotor tasks. <sup>4,10,20</sup>

9. Why are body weight support treadmill training and robotic assist training "should not" recommendations?

Evidence: Included within the studies under review in the CPG were individuals in the chronic stages of recovery. Most of these individuals had the ability to walk. Therefore, providing body weight support or robotic assist reduces the intensity of walking training, and intensity is a critical exercise training parameter. However, body weight support devices can be used as a catch, to maximize challenge and intensity during gait training while minimizing falls. <sup>3,18,21,22</sup>

10. Should I use high intensity training in inpatient rehabilitation?

Evidence: The CPG focus on chronic traumatic brain injury (TBI), incomplete spinal cord injury (iSCI) and stroke (CVA), however there is a multitude of evidence that high intensity locomotor training is beneficial for the sub-acute population. A CPG is currently underway for this patient population, more to come! Please refer to the Intensity Matters webpage for references for sub-acute populations. Selected studies do suggest HIGT can be applied during inpatient rehabilitation. <sup>23,24</sup>

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11. What equipment could be required to perform high intensity gait training?
  1. Heart monitor – please see our heart rate monitor options document (need to link there)
  2. Walking space or a treadmill
  3. Safety equipment – please see the equipment recommendations (need to link there)
  
12. What if my patient is not ready for walking?

Evidence: Practicing pre-gait activities will not lead to gains in locomotor outcomes. Walking is a continuous task, therefore, to improve walking, you must practice walking. Remember, you can also use braces, assistive devices, or body weight support systems for individuals who are non-ambulatory.<sup>4,25</sup>
  
13. What if I do not have extra physical help to deliver HIGT?

Evidence: Extra support for HIGT is sometimes required when the patient cannot walk on their own. In the CPG, all individuals had some ability to walk, therefore, more than one person was not needed. For individuals who are early after neurologic injury, a suspension system, body weight support, pelvic strapping, or thera-band can be helpful in those with reduced ambulatory capacity. However, rarely are three people required. Please see how to videos under the implementation section for more guidance.<sup>15,19,26,27</sup>

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## References

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