

Author Year Country Research Design Score Total Sample Size	Methods	Outcome
Tan et al. 2021 USA RCT cross-over PEDro = 8 Level 1 N = 11	Population: 11 participants with incomplete SCI and the ability to walk at least one step without human assistance; 9 males and 2 females; mean age 46.8 years; injury level C4 (n = 4), C5 (n = 2), C6 (n = 1), C8 (n = 1), T3 (n = 1), T5 (n = 1), and T9 (n = 1); and mean time since injury 8.5 years. Treatment: Participants received AIH + WALK or AIH_{sham} + WALK (SHAM + WALK) with a washout period of 2 weeks. Interventions consisted in five consecutive days receiving: • The single AIH protocol session consisted of 15, 90s episodes of breathing at a fraction of inspired oxygen (FiO₂) = 0.10 ± 0.02 with 60s room air intervals at a FiO₂ of 0.21 ± 0.02; and the SHAM breathing protocol session consisted in the same breathing episodes but always set at a FiO₂ of 0.21 ± 0.02 (room air). • Walking practice during 30 min at their perceived maximum voluntary walking speed, approximately 15 min following completion of the breathing protocol. Outcome Measures: Walking performance (10MWT and 6MWT) and intralimb motor coordination using kinematic variability measures of foot trajectory (i.e., endpoint variability), and of inter-joint coupling between the hip and knee, as well as between the knee and ankle joints (i.e., angular coefficient of correspondence) were	1. No serious AEs occurred during the interventions. 2. Participants significantly improved overground walking speed and endurance following the daily AIH + WALK intervention relative to their baselines (with these improvements persisting at F1 and at F2), but not following daily SHAM+WALK. 3. Improvements in the 10MWT and 6MWT following daily AIH + WALK did not result in more consistent foot trajectories of the more impaired leg. 4. Comparison of changes between participants who used bilateral walking aids (n = 5) and those who did not (n = 6) showed that participants achieved comparable gains in walking endurance following daily AIH + WALK; however, those participants who used bilateral arm-driven walking aids achieved greater change in their 10MWT time following daily AIH + WALK as compared to those participants who did not.

	assessed at baseline (BL), 1-week (F1), and 2-weeks (F2) following each combinatorial intervention*. *Walking performance was also assessed at the end of the fifth day of the treatment intervention (T5).	
McKenzie et al. 2024 USA RCT crossover PEDro = 5 Level 2 N = 10	Population: 10 participants with incomplete (ASIA D) and chronic SCI and with the ability to ambulate at least 14 m without physical assistance. 8M, 2F Mean (SD) age: 46.90 (16.53) years. Injury level: C4-T12 Mean (SD) time since injury: 8.75 (9.44) years Treatment: Participants completed 3 arms of the study in random order, with a minimum of a 4-week washout between arms: - Real AIH with tSCS during gait training (AIH + tSCS). - SHAM AIH with tSCS during gait training (SHAM AIH + tSCS). - Gait training alone (SHAM + SHAM). Participants completed 5 intervention sessions for each arm. Each intervention session consisted of: - AIH delivery: 15 cycles of AIH (9% O₂, fraction of inspired air [FiO₂]: 0.09; alternating with 15 cycles of normoxia (Nx) [21% O₂, FiO₂: 0.21] or SHAM AIH (15 alternating exposures of normoxic air [21% O₂]). Each hypoxia cycle was administered until the participant's oxygen saturation reached this nadir or for up to 90 seconds. Nx was delivered for up to 90 seconds. 30 minutes of rest. 30 minutes of OGT (Borg Rating of Perceived Exertion	- No AEs occurred throughout the trial. - Walking speed at self-selected velocity: At 3 days postintervention, the improvement for self-selected velocity in the AIH + tSCS arm was significantly greater than the improvements in the SHAM AIH + tSCS arm (between-group MD: 0.08 m/s, 95% CI: 0.02-0.14 m/s, P=0.04, g=0.31). Additionally, within the AIH + tSCS arm, the MCID of 0.06 m/s was met at 3 days postintervention with an average improvement from baseline of 0.06 m/s (95% CI: 0.00-0.12 m/s, P=0.18, g=0.14), and approached the MCID at 1WK (within MD 1WK-baseline: 0.05 m/s, 95% CI: 0.01 to 0.12 m/s, P=0.34, g=0.17). - Walking speed at fast velocity: The fast velocity improvements of the AIH + tSCS arm at each time point compared with the other two arms were insignificant and had small effect sizes. The same trend was seen for within arm comparisons for improvements over time compared with baseline. However, the improvements from baseline to 1WK of the AIH + tSCS arm, although small, had greater effect sizes (1WK-baseline g=0.12) compared with the other 2 arms (1WK-baseline g=0.09, g=0.03). Regardless of the order of arms, the final arm baseline fast velocity was significantly greater than the first (0.10 m/s, P=0.02) and

	14-17 out of 20) with tSCS or SHAM tSCS. tSCS was delivered medially between the C6-6, T11-12, and L1-L2 levels. Continuous stimulation was applied during gait training consisting of biphasic, rectangular 1-ms pulses at a frequency of 30 Hz with a carrier frequency of 10kHz. Stimulation intensity was determined by assessing spinal motor evoked responses at baseline. For SHAM stimulation, tSCS was turned on for the first 5-10 seconds of walking and then deactivated by the clinician without notifying the participant. Outcome Measures: - Walking speed at self-selected velocity and fast velocity using the 10MWT; 6MWT; and TUG test were measured at baseline before intervention, intervention session 5 (INT5), 3 days postintervention (POST), and 1-week following POST assessment (1WK). - Maximum isometric ankle plantarflexion torque was assessed within each arm at baseline and 3 days postintervention using a strength testing dynamometer.	second (0.06 m/s, $P=0.01$) baseline. 4. 6MWT: For the 6MWT, there were no significant between-group improvements. For the within improvements of the AIH + tSCS arm there was a meaningful change for people with neurologic injuries with an improvement from baseline to 1WK of 21.5 m (95% CI: 3.4-39.6 m, $P=0.06$, $g=0.22$). The baseline mean 6MWT distance at the final arm was significantly greater than the first baseline (39.18 m, $P=0.02$). 5. Isometric ankle torque: The results for isometric plantarflexion showed that maximal torque increased an average of 23.8% (95% CI: 2.6 to 50.3%, $P=0.66$) for the weak side and 11.3% (95% CI: 5.3 to 28.0%, $P=0.25$) on the strong side after AIH + tSCS arm. However, there was no significant difference in strength percent change between the arms.
Navarrete-Opazo et al. 2017a Chile RCT PEDro = 4 Level 2 N = 35	Population: 35 participants with chronic and incomplete SCI; 31 males and 4 females; mean ($\pm$ SD) age 41 ($\pm$ 17) years; injury level C4 (n = 1), C5 (n = 3), C6 (n = 6), C7 (n = 2), T1 (n = 1), T3 (n = 2), T4 (n = 1), T6 (n = 3), T9 (n = 3), T10 (n = 1), T12 (n = 4), L1 (n = 3), L3 (n = 3), L4 (n = 1); AIS C (n = 13) and AIS D (n = 22); and mean ($\pm$ SD) time since injury 53 ($\pm$ 40) months.	1. The interventions were well tolerated by all participants; with no side effects being reported. 2. Within-group comparisons showed that overall, the IH group had a significant decrease in 10MWT time from day 5 to week 2 (-10.2 – 3.0 vs. -15.5 – 4.8 sec, $p = 0.03$), which was maintained up to the 2-week

	Treatment: Participants were randomly allocated into two groups: - Experimental group (n = 18): The intermittent hypoxia (IH) protocol consisted of 90sec of 9% O₂ interspersed with 90 sec of 21% O₂, 15 times a day, for 5 consecutive days, followed by IH three times per week for 3 additional weeks. - Control group (n = 17): The placebo protocol consisted of continuous Nx (21% O₂) for 45 min for 5 consecutive days followed by three times per week for 3 weeks. Following the IH/Nx protocol, all participants performed BWSTT for 45 min (for 5 consecutive days the first week and 3 times per week for 3 additional weeks). Outcome Measures: 10MWT and 6MWT were assessed at baseline, day 5, weekly from weeks 2–4, and at a 2-week follow-up.	follow-up (-15.5–4.8 vs. -20.3–6.9s, p = 0.09). - Between-group comparisons showed that the IH group had a greater walking speed than the control group, between baseline vs. at 5 days after the interventions (IH: -10.2 – 3.0 vs. Nx: -1.8 – 1.7 sec, p = 0.006). This trend was maintained at week 2 and week 3 but not at week 4 (p = 0.54). A 2-week follow-up showed that both groups maintained a walking speed significantly faster than baseline (p < 0.05), and differences between groups approached statistical significance (p = 0.06). - Within-group comparisons showed that the IH group had a progressive increase in walking distance from day 5 to week 4 (43.1 – 10.7 vs. 70.5 – 13.2 m, p = 0.007), and this increase persisted for 2 weeks after the completion of the study (70.5 – 13.2 vs. 65.7 – 11.5, p = 0.49). - Between-group comparisons showed that there was a greater walking endurance in the IH group compared with the control group at day 5 (IH: 43.1–10.7 vs. Nx: 6.1–3.4m, p = 0.012) and at later time points.
Hayes et al. 2014 USA RCT PEDro = 8 Level 1 N = 22	Population: 22 participants with chronic incomplete SCI; 16 males and 3 females; mean (± SD) age 43 (± 4) years; injury level C2 (n = 1), C4 (n = 5), C5 (n = 5), C6 (n = 3), C7 (n = 1), T3 (n = 1), T4 (n = 1), T7 (n = 2), and T8 (n = 1); AIS C (n = 1) and AIS D (n = 17); and mean (± SD) time since injury 9 (± 2) years. Treatment: The study consisted of 2 experimental blocks: In block 1, participants were randomly assigned to first receive either daily AIH (dAIH) (n = 6) or daily SHAM	- The intervention was well tolerated with no AEs being reported. - dAIH vs. dSHAM: - Decreases in time in 10MWT were greater for dAIH compared with dSHAM after only one AIH exposure (p = 0.006) and this difference persisted at F2 (p = 0.010). - Walking endurance significantly increased in both groups, with no differences between-groups at F1 and F2.

	(dSHAM) (n = 5), and then the other intervention a minimum of 2 weeks later. In block 2, participants were randomly assigned to first receive either daily AIH + walking (n = 5) or daily SHAM + walking (n = 6), and then the other intervention a minimum of 2 weeks later. Daily AIH (5 consecutive days) consisted of 15, 90-s hypoxic episodes ($\text{FIO}_2 = 0.09$) with 60-s normoxic intervals ($\text{FIO}_2 = 0.21$). Daily SHAM, consisted of 15, 90-s simulated normoxic episodes ($\text{FIO}_2 = 0.21$) with 60-s normoxic intervals ($\text{FIO}_2 = 0.21$). In block 2, participants received the daily AIH or daily SHAM, followed within 60 min by OWT. Outcome Measures: 10MWT and 6MWT were assessed at baseline, at day 1 (D1), day 5 (D5), and at follow-up at 1 week (F1) and 2 weeks (F2).	3. dAIH + walking vs. dSHAM + walking: - Participants receiving dAIH + walking increased walking endurance more than dSHAM + walking at D5 ($p = 0.017$) and F1 ($p = 0.014$). 10MWT times remained unchanged from baseline after AIH + walking, but with a greater decrease than dSHAM + walking after one exposure ($p = 0.013$). 4. dAIH vs. dAIH + walking: - Combined dAIH + walking increased walking distance more than dAIH alone at D1 ($p = 0.046$), D5 ($p = 0.002$), and F1 ($p = 0.001$). - Combined dAIH + walking did not improve speed more than dAIH alone.
--	--	--