Author Year Country Score Research Design Total Sample Size	Methods	Outcome
Alexeeva et al. 2011 USA PEDro=7 RCT N=35	**Population:** Fixed Track Group: Mean age: 37.3± 13 yrs ; Gender: 12 males, 2 females; Level of injury: ASIA C (17%), ASIA D (83%); Cause of injury: traumatic (100%) Treadmill Group: Mean age: 36.4±12.9 yrs ; Gender: 8 males, 1 female; Level of injury: ASIA C (36%), ASIA D (64%); Cause of injury: traumatic (100%) Physical Therapy Group: Mean age: 43.3±15.8 yrs ; Gender: 10 males, 2 females; Level of injury: ASIA C (11%), ASIA D (89%); Cause of injury: traumatic (75%), non-traumatic (25%) **Treatment:** Patients participated in a body weight supported training program (Fixed Track or Treadmill) or comprehensive physical therapy for 1hr/d, 3 d/wk for 13 wks. **Outcome Measures:** FIM (motor domain component only); Tinetti Scale	1. There was a slight increase in FIM motor scores after training, but it was not significant. 2. There were significant improvements in balance pre-to-post in the PT group ($p<0.001$) and the Track group ($p<0.01$), but no significant difference for the Treadmill group.
Klose et al. 1990 USA PEDro=5 RCT N=43	**Population:** Age (range): 18-45 yrs; Level of injury (range): C4-C6; Severity of injury: incomplete (43); Time post-injury: minimum of one year **Treatment:** Training blocks of either supervised physical exercise therapy (PET), neuromuscular stimulation, or electromyographic biofeedback. Group 1 received 8 wks each of EMG biofeedback followed by PET, group 2 received 8 wks each of EMG biofeedback followed by NMS, group 3 received 8 wks each of NMS followed by PET, and group 4 received 16 wks of PET (3d/wk). **Outcome Measures:** Manual muscle tests, self-care scores, mobility	1. Significant improvements were found for measures of mobility, self-care, and left arm manual muscle test scores ($p<0.05$). 2. The repeated measures component was significant for all of the outcome measures except the EMGs ($p<0.01$). 3. All exercise modes were effective. No difference was found on comparisons between groups.
Harness et al. 2008 USA Prospective, non-randomized, controlled trial Initial N=31, Final N=29	**Population:** Intense Exercise Group: Mean age: 37.8±3.6 yrs; Gender: 18 males, 3 females; Severity of Injury: ASIA A or B (57%), ASIA C or D (43%) Control: Mean age: 34.5±2.9 yrs; Gender: 8 males **Treatment:** Treatment group - multi-modal intense exercise program; Control group - self-regulated exercise. **Outcome Measures:**Motor gains via ASIA motor score	1. When compared to control participants, intense exercise participants had significantly larger clinical gains as measured by changes in ASIA motor score ($p=0.0001$). ASIA motor score changes were mostly attributed to lower extremity motor scores; lower extremity motor scores had a significant group difference ($p<0.04$), while upper extremity motor scores did not.
Bjekefors et al. 2006 Sweden Pre-Post N=10	**Population:** Mean age: 37.6 yrs (range: 24-60); Gender: 7 males, 3 females; Level of injury: T3-12; Severity of injury: ASIA A (70%), ASIA B (20%), ASIA C (10%) **Treatment:** Patients received kayak ergometer training for 60 min, 3d/wk for 10 wks.	1. Sit-and-reach test scores showed a significant improvement from pre- to post-intervention ($p<0.05$). There was a statistically significant improvement in mounting-a-platform, propelling 15m on a level surface and propelling 50m on an incline from pre-to post-training ($p<0.05$)

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	Outcome Measures: Sit-and-reach test, propelling tests, and transfer/propelling wheelchair tests.	2. The results of the transfer test showed a 10% mean increase after training.
Bjerkefors et al. 2007 Sweden Pre-Post N=10	**Population:** Mean Age: 38±12 yrs; Level of injury: T3-12; Severity of injury: ASIA A (70%), ASIA B (20%), ASIA C (10%) **Treatment:** Patients received kayak ergometer training for 60 min, 3d/wk for 10 wks. **Outcome Measures:** Anterior-posterior (AP) angular and linear displacement during forward, backward, and lateral translations; medio-lateral (ML) angular and linear displacement during lateral translations; trunk twisting angular displacement during lateral translation; postural stability.	1. There were significantly smaller AP angular trunk displacements during lateral translations when comparing post-training with pre-training ($p=0.038$). There were no differences in FWD or BWD translations. 2. Results demonstrated significantly smaller AP linear trunk displacements post-training compared to pre-training for all translations (LAT, FWD and BWD) ($p<0.05$). There was an effect of training on ML angular trunk displacement during lateral translations for kinematic response IV (trunk position 1s after the end of platform deceleration) ($p<0.05$). 3. There were no significant effects of training on ML linear displacement during lateral translations. 4. There were statistically significant improvements in trunk twisting post-training ($p<0.05$). 5. Patients' postural stability was improved post-training; patients' showed smaller rotational and linear displacements of the trunk.
Chen et al. 2006 USA Pre-Post N=16	**Population:** Mean age: 43.8 yrs (range: 21-66); Gender: 9 males, 7 females; Level of injury: tetraplegia (25%) and paraplegia (75%); Severity of injury: ASIA A (56%), C (19%), D (25%); Cause of injury: traumatic (93.75%) and non-traumatic (6.25%) ; **Treatment:** 12 wks of a weight management program (e.g., nutrition, exercise, behaviour modification training) + 1-30 min exercise session for 6 wks. **Outcome Measures:** Three self-reported statements measured on a 5-point scale (difficulty transferring difficulty putting on/taking off clothes and time required for a bowel movement.	1. There was a statistically significant improvement in self-reports of difficulty transferring post-treatment ($p=0.004$). 2. There was a statistically significant improvement in self-reports of difficulty putting on/taking off clothes post-treatment ($p=0.02$). 3. Time required for a bowel movement improved with a mean change of -27.5 minutes, but this improvement was not statistically significant ($p=0.27$).
Hetz et al. 2008 Canada Observational N=48	**Population:** Mean age: 39.48; Gender: 35 males, 13 females; Level of injury: tetraplegia (39.6%), paraplegia (60.4%%); Severity of injury: complete (58.3%), incomplete (41.7%); Cause of injury: traumatic (81.3%), non-traumatic (18.8%) **Treatment:** Questionnaire **Outcome Measures:** Physical Activity Recall Assessment for People with Spinal Cord Injury (PARA-SCI)	1. Although there were no statistically significant differences in terms of ADL participation between men and women and between individuals with paraplegia and tetraplegia, when compared to men, women spent more time with domestic and personal care activities and those with paraplegia spent more time transferring, cleaning, and preparing food, while individuals with tetraplegia

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		spent more time engaging in dressing, toileting, and wheeling. 2. VO_2 Max was significantly associated with increased participation in cleaning and wheeling ($p<0.05$). 3. Wheeling, dressing, and toileting were positively correlated with moderate- and heavy-intensity LTPA ($p<0.05$).
da Silva et al. 2005 Brazil Downs & Black score=18 Prospective controlled trial N=16	**Population:** Chronic SCI with AISA A Experimental Group (EG): Age (range): 21-34 yrs; Gender: 7 males, 1 emale;; Time post-injury (range): 15-40 mo Control Group (CG): Age (range): 21-41 yrs; Gender: 7 males, 1 female; Time post-injury (range):14-30 mo **Treatment:** Comparison of swimming program vs. normal daily activities upon discharge from rehabilitation (both groups received orientation class during rehabilitation on numerous SCI related topics including swimming). Experimental group (EG): Swimming program with a Physical Educator professor, 2d/wk, 45 min each, consisting of a warm up, main exercise & cool-down. **Outcome Measures:** Functional Independence Measure (FIM) at discharge & follow-up (avg 4 mo post-discharge).	1. Pre vs. post swimming program: • Body care: EG -↑ (p=0.01), CG - ↑ (p=0.02) • Transference: EG - ↑ (p=0.00), CG - ↑ (p=0.04) • Overall motor score= EG - ↑ (p=0.00), CG -↑ (p=0.01) • Overall FIM score = EG - ↑ (p=0.00), CG -↑ (p=0.02) • Other areas did not have significant changes in either group. 2. More significant ↑ (difference scores in EG vs. CG for transference (p=0.02), overall motor score (p=0.01) and overall score (p=0.01).
Hjeltnes & Wallberg-Henriksson 1998 Norway Downs & Black score=16 Prospective controlled trial (dissimilar control group) N=20	**Population:** Exercise group: Level of Injury: tetraplegia (10): Severity of injury: AISA A (70%), ASIA B (30%); Mean time post-injury: 99 d Control Group: Level of injury: paraplegia (10); AISA A (100%); Mean time post-injury: 78 d **Treatment:** Exercise group: standard rehabilitation + arm ergometry (tetraplegia), 30 min/d, 3 d/wk for a 12-16 wk period; Control group: standard rehabilitation (paraplegia). **Outcome Measures:** Ability to perform activities of daily living (Sunnaas ADL index), muscle strength (manual muscle testing), physiological assessments (VO_2, load) collected pre, mid & post program.	1. Experimental (tetraplegia) and Control (paraplegia) groups were not compared for functional and strength scores. Otherwise : a. ↑ in ADL ability from pre to post program in those with tetraplegia ($p<0.001$). b. ↑ in manual muscle scores from pre to post program in those with tetraplegia ($p<0.001$). c. Peak resistance to cycling increased over cycling program but VO_2 did not.
Durán et al. 2001 Colombia Downs & Black score=16 Pre-post N=13	**Population:** Age (range): 17-38yrs; Gender: 12 males. 1 female; Time post-injury (range): 2-120 mo; Severity of injury: ASIA A (85%), ASIA B (7.5%), ASIA C (7.5%) **Treatment:** 16 wk exercise program (4 wks adaptation, 1 wk enhancement, 11 wks specific program)- 3d/wk, 120 min/session, containing mobility, coordination, strength, aerobic resistance and relaxation exercises. **Outcome Measures:** Functional Independence Measure (FIM), Wheelchair skills test and various strength/resistance and	1. ↑ FIM from pre to post program, 106 to 113 respectively ($p<0.001$). 2. Reduced time for all 9 wheelchair skills from pre to post program, ($p<0.04$ or less). 3. ↑ in work capacity (weight lifted and reps) pre to post program. 4. Generally no sig. diff. in various physiological parameters.

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	physiological measures collected pre & post program.	
Sloan et al. 1994 Australia Downs & Black score=14 Pre-post N=12	**Population:** Age (range): 15-54 yrs; Gender: 7 males, 5 females; Severity of injury: complete (1), incomplete (11); Time post-injury (range): 2 -138 mo **Treatment:** Functional electrical stimulation (FES) induced cycling programme: 3d/wk for 3 mo, all programmes were individualized & gradual progressed to 30 min/session. **Outcome Measures:** Functional assessment: independence & activities of daily living (ADL) tasks, muscle testing (grade and size) collected pre & post programme.	1. All incomplete SCI patients had subjective self-reported improvements in well-being & functional independence, namely walking, dressing, transferring and ADL tasks. 2. Most muscles increased in area and strength. 3. Variable changes in spasticity (2 people discontinued because of increases in spasticity).
Dallmeijer et al. 1999 The Netherlands Downs & Black score=13 Pre-post Initial N=27, Final N=20	**Population:** Mean age: 40.3 yrs; Gender: 16 males,4 females; Level of injury: paraplegia (11) tetraplegia (9),; AISA B, C & D; Mean time post-injury: t1=331 d, t2=765 d **Treatment:** Described changes in first years post-discharge and examined effect of those participating in ≥1 hr/wk of sport vs. those with no activity on physical capacity. **Outcome Measures:** Standardized ADL tasks physical strain & performance time (ascending ramp, transfer, passing door, washing hands); Sport activity & health status questionnaire; physical capacity (strength, power, VO_2 on wheelchair ergometer test) collected @ discharge (t1) & follow-up (t2, mean time=1.2 yrs).	1. Description of participation, illness, musculoskeletal system complaints: • 8/20=sedentary, 12 participated in ≥1 hr/wk (Overall group mean= 2.5 hrs/wk). • 10/20=serious illness during time span (UTI, pressure sores, pain, intestinal problems, pneumonia). • 9/20 Musculoskeletal system complaints. 2. Physical strain: was reduced over the year for all ADL tasks, except hand washing. 3. Performance time: ↓ in transfer & ramp only ($p<0.05$) between t1 and t2 but not for other ADL tasks. 4. Participation in sport was correlated with measures of improved physical capacity (no relationship with ADL was assessed).
Effing et al. 2006 The Netherlands Downs & Black score=13 Pre-post (Single subject controlled design) N=3	**Population:** Chronic incomplete SCI; Age (range): 45-51 yrs; Gender: 3 males; Severity of injury: AISA C (75%), ASIA D (25%); Time post-injury (range): 29-168 mo **Treatment:** Body weight supported treadmill training 5d/wk for 30 min/session for 12 wks personalized to physical abilities. **Outcome Measures:** Perceived performance on activities of daily living (ADL) – Canadian Occupational Performance Measure (COPM); Semi-structured interview; Performance based walking – Walking Capacity Scale; Walking Speed – 7 m; Balance & Mobility - Get Up & Go Test. Collected at baseline, 6 wks – treatment, 12 wks – wash-out, 6 wks – follow-up, 6 mo.	1. Subject 1: • Perceived ADL performance: rather stable, ↓ satisfaction during intervention phase ($p<0.01$). • Interview: walked further without rest, felt better overall • Walking speed: ↑ speed with ↓ steps ($p<0.05$) • Balance: ↑ ($p<0.05$). 2. Subject 2: • Perceived ADL performance: ↑ improvement during intervention into washout period ($p<0.01$) • Interview: transfer independently, ↓ pain medications, ↓ spasms, felt better overall • Walking performance: ↑ ($p<0.01$)

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		• Could not perform walking speed & balance tests. 3. Subject 3: • Perceived ADL performance: ↑ improvement; however, not in the intervention phase ($p<0.05$). • Interview: sit longer in a wheelchair, more stability, walking ability with a cane, ↓ pressure ulcers, felt better overall • Walking performance: ↑ ($p<0.05$) • Balance: ↑ ($p<0.01$).