Author Year Country Research Design Score Total Sample Size	Methods	Outcome
Bednarczky & Sanderson 1995 Canada Prospective Controlled Trial N=20	**Population:** Mean age: 33.5 yr; Gender: males=7, females=3; Mean weight: 68.5 kg; Weight range: 53.7-84.7 kg; Level of injury: paraplegia=10, NR=10. **Intervention:** Propelling across a runway using the Kuschall Champion 3000 wheelchair at 2 m/sec. Three conditions: 1) no weight added; 2) 5 kg added; 3) 10 kg added. Five propulsion trials were completed for each condition. **Outcome Measures:** Propulsive and recovery phases timing, Angular displacements of extremities (elbow flexion-extension, shoulder flexion-extension, shoulder abduction, trunk flexion-extension).	1. In all conditions, grab and release (wheel contact to release) did not have a significant variation. 2. No significant effects were found regarding the angular variables in weight conditions; however, significant group effects were found for elbow flexion-extension ($p=0.003$), shoulder flexion-extension ($p=0.0007$), and shoulder abduction ($p=0.0003$).
Beekman et al. 1999 USA Pre-Post N=74	**Population**: Mean age: 26.2 yr; Gender: males=69, females=5; Level of injury: paraplegia=44, tetraplegia=30, C6=14, C7-8=16, T2-8=19, T10-L1=25. **Intervention:** Using a standard wheelchair (SWC) and an ultralight wheelchair (UWC) to propel self for 20min on an outdoor track (60.5 m in circumference). **Outcome Measures:** Speed and distance travelled; Oxygen consumption – Douglas Bag technique; Heart rate; Vital capacity; all at 3-5 min, 9-10 min, 14-15 min, 19-20 min.	1. Subjects travelled a longer distance and at a faster speed in the UWC versus the SWC for T2-8 ($p<0.00$), T10-L1 ($p<0.01$) and subjects with tetraplegia as a whole ($p=0.01$), but not separately. Oxygen consumption also decreased for T2-8 ($p<0.00$) and T10-L1 ($p<0.01$). 2. Distance and speed differed between subjects with tetraplegia and paraplegia independent of wheelchair or time ($p<0.00$). C6 had a significantly high oxygen consumption level, compared to all other subgroups ($p<0.01$). 3. With the exception of C6, all subgroups increased speed over the 20min interval, regardless of wheelchair used.
Parziale 1991 USA Pre-Post N=26	**Population:** Age range: 20-40 yr; Gender: males=26, females=0; Level of Injury: paraplegia (T1-T6)=8, paraplegia (T7-L4)=12, tetraplegia (C5-C8)=6; Mean time since injury: 6 mo. **Intervention:** Patients performed a sprint test in both a study standard and a lightweight wheelchair at maximum speed for 400 ft followed by an endurance test of both wheelchairs in which patients had to propel as far as they could in 4 min. **Outcome Measures:** Systolic and diastolic blood pressure, Pulse rate, Respirations per minute, Time performance, Distance.	1. Systolic blood pressure was significantly different between levels of injury (high paraplegia, low paraplegia and tetraplegia) for both the wheelchair sprint and endurance tests (both $p<0.001$) but not between wheelchair type. 2. Time performance on the sprint test was significantly different between levels of injury ($p<0.001$) and wheelchair type ($p<0.01$) on the sprint test with the lightweight wheelchair achieving faster speeds than the conventional wheelchair. 3. Distance covered in the endurance test was significantly different between levels of injury

Author Year Country Research Design Score Total Sample Size	Methods	Outcome
		(p<0.001) but not between wheelchair type. 4. No significant differences were reported between level of injury and wheelchair type with diastolic blood pressure, pulse rate and respirations per min.
Collinger et al. 2008 USA Post-test N=61	**Population:** Mean age: 43.1 yr; Gender: males=49, females=12; Mean height: 1.76 m; Mean weight: 75.9 kg; Level of injury: paraplegia=61; Mean time since injury: 14.6 yr; Chronicity=chronic. **Intervention:** Propulsion of personal wheelchair on a dynamometer at three different speeds (self-selected-SP1, 0.9m/sec-SP2; 1.8 m/sec-SP3). **Outcome Measures:** Demographic differences, Subject characteristics, Shoulder biomechanics.	1. As propulsion speed increased, so did shoulder joint loading. There was an increase in mean resultant force from 54.4 N at SP2, to 75.7 N at SP3 (p<0.001). 2. Of the demographic variables, body weight had the largest influence on shoulder forces. 3. When the arm is extended and internally rotated, peak shoulder joint loading is indicated, increasing the possibility of shoulder injury.
Boninger et al. 1999 USA Post-test N=34	**Population:** Age range: 20.7-53.1 yr; Gender: males=23, females=11; Level of injury: paraplegia=34; Range of time since injury: 1.2-25.2 yr; Chronicity=chronic. **Intervention:** Self propulsion of personal wheelchair on a dynamometer at 0.9 m/sec (SP1) and 1.8 m/sec (SP2). **Outcome Measures:** Median and ulnar nerve conduction, propulsion velocity, Frequency of propulsion stroke, Peak force, Maximum rate of rise.	1. Rate of rise (resultant force) and peak pushrim force and subject weight were significantly correlated at SP1 and SP2 (r=0.59, p<0.001). 2. With regards to the nerve conduction studies, subject weight was significantly correlated with mean median nerve latency (r=0.36, p<0.01) and mean median sensor amplitude (r=-0.43, p<0.01). Subject height was significantly correlated to mean sensory amplitude (r=-0.58, p<0.01). 3. Peak force was related to mean median nerve latency (r=0.59, p<0.001), and was inversely related to mean sensory amplitude (r=-0.59, p<0.01).