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<tr>
<th>NCT ID</th>
<th>Sponsor</th>
<th>Intervention</th>
<th>Criteria</th>
<th>Status</th>
<th>Target Enrollment</th>
<th>Study Phase &amp; Design</th>
<th>Primary Intervention Type</th>
<th>Primary Intervention Potential Benefit</th>
<th>Outcome Measures and Follow Up</th>
<th>Study Start Date</th>
<th>First Posted</th>
<th>Last Updated</th>
<th>Location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT04307303</td>
<td>Hospital Nacional de Parapléjicos de Toledo</td>
<td>Training by means of Antenna Spring device (80x50mm sessions) compared to conventional therapy.</td>
<td>Age 16-65 yrs &lt; SCI = 2 &lt; no muscular spasticity (at least CI) SCI &lt; 6 months (subacute)</td>
<td>Recruiting</td>
<td>36</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>May 13, 2020</td>
<td>May 12, 2020</td>
<td>Toledo, Spain</td>
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<tr>
<td>NCT04309448</td>
<td>Quality living, Inc.</td>
<td>Functional-electrical stimulation of the calves, quads and/or abdominals.</td>
<td>Age 16-75 yrs SCI C1-C5 Abk.na</td>
<td>Eligibility by invitation</td>
<td>10</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Technology</td>
<td>General Health</td>
<td>April 20</td>
<td>April 30, 2020</td>
<td>Salisbury, UK</td>
<td></td>
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<tr>
<td>NCT04323449</td>
<td>Rehabit-kagawa and Cycle</td>
<td>Brain computer interface therapy with Functional Electrical Stimulation</td>
<td>Age 16-85 yrs SCI C3-C6 Sub-acute patients post spinal injury &lt; no other neurological conditions</td>
<td>Not yet recruiting</td>
<td>26</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>July 20</td>
<td>April 30, 2020</td>
<td>Kagawa, UK</td>
<td></td>
</tr>
<tr>
<td>NCT04340063</td>
<td>VA Office of Research and Development</td>
<td>Gait training performed on a treadmill or using a power wheelchair as primary mobility support</td>
<td>SCI C1-T10 &gt;6 months post spinal injury &lt; no severe spasticity in the lower limbs</td>
<td>Not yet recruiting</td>
<td>26</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Rehabilitation</td>
<td>Standing/Walking/I mobility</td>
<td>September 2, 2020</td>
<td>May 4, 2020</td>
<td>Hines, IL, USA</td>
<td></td>
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<tr>
<td>NCT04369131</td>
<td>University Health Network, Toronto</td>
<td>Performance-based Balance training with Functional electrical stimulation</td>
<td>Age &gt;18 yrs SCI C1-C5 &gt;1 year post spinal injury &lt; unable to take a step independently without physical assistance or upper extremity support</td>
<td>Recruiting</td>
<td>25</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Technology</td>
<td>Standing/Walking/I mobility</td>
<td>March 26, 2020</td>
<td>March 26, 2020</td>
<td>Pittsburgh, PA</td>
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<tr>
<td>NCT04374500</td>
<td>Rehabit-kagawa and Cycle</td>
<td>Brain computer interface therapy with Functional Electrical Stimulation</td>
<td>Age 16-85 yrs SCI C3-C6 Sub-acute patients post spinal injury &lt; no other neurological conditions</td>
<td>Not yet recruiting</td>
<td>26</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>May 10</td>
<td>September 2020</td>
<td>Tokyo, Japan</td>
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<tr>
<td>NCT04382931</td>
<td>Salisbury NHS Foundation Trust</td>
<td>Functional electrical stimulation of the abdominal muscles</td>
<td>Age &gt;=18 yrs SCI C1-T10 &gt;1 year post spinal injury &lt; no implanted electrical devices (cardiac pacemaker in situ or other)</td>
<td>Recruiting</td>
<td>56</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Technology</td>
<td>Bowel Health</td>
<td>May 13, 2020</td>
<td>May 13, 2020</td>
<td>Salisbury, UK</td>
<td></td>
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<tr>
<td>NCT04393959</td>
<td>Whole Island Hospital</td>
<td>Intelligent Spine Interface - Centrimal (55x-C) is a Epidural Electrical Stimulation (EES). The aim is to restore volitional control of the lower limbs.</td>
<td>Age 18-85 yrs SCI C1-T10 &gt;1 year post spinal injury &lt; no implanted electrical devices (cardiac pace maker in situ or other)</td>
<td>Not yet recruiting</td>
<td>3</td>
<td>Model: Single Group</td>
<td>None (Open Label)</td>
<td>Technology</td>
<td>General Health</td>
<td>May 13, 2020</td>
<td>May 13, 2020</td>
<td>Honolulu, HI</td>
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</tr>
</tbody>
</table>

Outcome Measures and Follow Up:

- F/U 2 months
- F/U 3 months
- F/U 8 weeks
- F/U 10 weeks
- F/U 1 month
- F/U 2 months
- F/U 3 months
- F/U 4 months
- F/U 5 months
- F/U 6 months
- F/U 8 months
- F/U 10 months
- F/U 12 months
- F/U 1 year
- F/U 2 years
- F/U 3 years
- F/U 4 years
- F/U 5 years
- F/U 6 years
- F/U 7 years
- F/U 8 years
- F/U 9 years
<table>
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<tr>
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<th>Primary Intervention Type</th>
<th>Primary Potential Benefit</th>
<th>Outcome Measures and Follow Up</th>
<th>Study Start Date</th>
<th>First Posted</th>
<th>Last Updated</th>
<th>Location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT04250688</td>
<td>University of Zurich</td>
<td>sci training three times a week for 6 weeks (16 training sessions). Each training session will last for 1 hour and will be conducted and supervised by an experienced physical therapist.</td>
<td>Age 18-85 yrs</td>
<td>NCI: 12</td>
<td>SCI - 6 months</td>
<td>SCI - 12 months</td>
<td>AS: C-D</td>
<td>Not yet recruiting</td>
<td>Not yet recruiting</td>
<td>March 2020</td>
<td>March 2, 2020</td>
<td>Zürich, Switzerland</td>
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<tr>
<td>NCT04288245</td>
<td>Baylor Research Institute</td>
<td>Active Vagus Nerve Stimulation paired with upper extremity rehabilitation.</td>
<td>Age 18-84 yrs</td>
<td>NCI: 12</td>
<td>Sci C1-D</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Not yet recruiting</td>
<td>Not yet recruiting</td>
<td>June 2020</td>
<td>February 28, 2020</td>
<td>Dallas, TX, USA</td>
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<tr>
<td>NCT04288245</td>
<td>Medical University of North Carolina</td>
<td>Operant conditioning training intervention in which the brain-spinal cord-muscle pathways are strengthened. Transcranial magnetic stimulation (TMS).</td>
<td>SCI: 1 year</td>
<td>NCI: 12</td>
<td>SCI - 12 months</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Recruiting</td>
<td>Not yet recruiting</td>
<td>June 2020</td>
<td>February 26, 2020</td>
<td>Pittsburgh, PA, USA</td>
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<tr>
<td>NCT04288245</td>
<td>Glasgow Caledonian University</td>
<td>An RCT comparing progressive resistance training in usual care for 'readily stable' inpatients with SCI.</td>
<td>Age 18-84 yrs</td>
<td>NCI: 12</td>
<td>SCI - 12 months</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Recruiting</td>
<td>Not yet recruiting</td>
<td>June 2020</td>
<td>February 11, 2020</td>
<td>Glasgow, UK</td>
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<tr>
<td>NCT04288245</td>
<td>Shiny Ryan AbilityLab</td>
<td>Beta training with FES</td>
<td>Age 18-84 yrs</td>
<td>NCI: 12</td>
<td>SCI C1-D</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Recruiting</td>
<td>Not yet recruiting</td>
<td>November 2019</td>
<td>February 11, 2020</td>
<td>Chicago, IL, USA</td>
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<tr>
<td>NCT04288245</td>
<td>NIH Office of Research and Development</td>
<td>Early intervention in SCI (TESS-supported rehabilitation) during rehabilitation following subacute SCI (TESS-supported rehabilitation)</td>
<td>Age 18-84 yrs</td>
<td>NCI: 12</td>
<td>SCI C1-D</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Recruiting</td>
<td>Not yet recruiting</td>
<td>July 2020</td>
<td>January 27, 2020</td>
<td>Richmond, VA, USA</td>
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</tr>
<tr>
<td>NCT04288245</td>
<td>Shepherd Center, Atlanta GA</td>
<td>Motor Body Vibration (MBV) and electrical stimulation: 9 bouts of MBV vibration with a minute of rest in between each bout.</td>
<td>Age 18-84 yrs</td>
<td>NCI: 12</td>
<td>SCI C1-D</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Recruiting</td>
<td>Not yet recruiting</td>
<td>April 2020</td>
<td>January 23, 2020</td>
<td>Atlanta, GA, USA</td>
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<tr>
<td>NCT04288245</td>
<td>Sinai/Kimmel Center for Neuroscience at Mount Sinai</td>
<td>Sci + electroacupuncture-assisted walking (SAEW) for early training compared to standard of care.</td>
<td>Age 18-84 yrs</td>
<td>NCI: 12</td>
<td>SCI - 12 months</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Recruiting</td>
<td>Not yet recruiting</td>
<td>September 2019</td>
<td>January 9, 2020</td>
<td>New York, NY, USA</td>
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<tr>
<td>NCT04288245</td>
<td>École Polytechnique Fédérale de Lausanne</td>
<td>Transcutaneous Bipolar Shock (TBS) and Electromyography (EMG) during rehabilitation following subacute SCI (TESS-supported rehabilitation)</td>
<td>Age 18-84 yrs</td>
<td>NCI: 12</td>
<td>SCI C1-D</td>
<td>SCI - 12 months</td>
<td>No SCI to sharp objects, firearms</td>
<td>Recruiting</td>
<td>Not yet recruiting</td>
<td>December 13, 2019</td>
<td>December 13, 2019</td>
<td>Lausanne, Switzerland</td>
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<tr>
<td>NCT ID</td>
<td>Sponsor</td>
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<td>Criteria</td>
<td>Status</td>
<td>Target Group(s)</td>
<td>Study Phase &amp; Design</td>
<td>Primary Intervention Type</td>
<td>Primary Potential Outcomes</td>
<td>Outcomes Measures and Follow Up</td>
<td>Study Start Date</td>
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<td>Last Updated</td>
<td>Location(s)</td>
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<tr>
<td>NCT04105296</td>
<td>Hulan Medical University</td>
<td>Transcutaneous electrical nerve stimulation (TENS) w/ fetal nerve stimulation</td>
<td>Age 20-85 yrs - ≤24wk from injury - SCI Level T12-T2 - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase 2</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Shenzhen, China</td>
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<tr>
<td>NCT04193709</td>
<td>University of Louisville</td>
<td>Transcutaneous electrical nerve stimulation (TENS) w/ fetal nerve stimulation</td>
<td>Age 20-85 yrs - ≤24wk from injury - SCI Level T12-T2 - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase 2</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Shenzhen, China</td>
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<tr>
<td>NCT04194099</td>
<td>The Hong Kong Polytechnic University</td>
<td>Non-invasive Trans-cranial Electrical Stimulation (tDCS)</td>
<td>Age 19-85 yrs - ≤6mos from injury - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>20</td>
<td>Phase 2</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Hong Kong</td>
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<tr>
<td>NCT04201096</td>
<td>Vanderbilt University</td>
<td>Non-invasive Trans-cranial Electrical Stimulation (tDCS)</td>
<td>Age 19-85 yrs - ≤6mos from injury - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>6</td>
<td>Phase 2</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
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<td>December 24, 2019</td>
<td>Nashville, TN</td>
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<tr>
<td>NCT04234053</td>
<td>The Neurosensory Clinic Trust</td>
<td>Transcutaneous electrical nerve stimulation (TENS) w/ fetal nerve stimulation</td>
<td>Age 20-85 yrs - ≤24wk from injury - SCI Level T12-T2 - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>12</td>
<td>Phase 2</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Richmond, VA</td>
</tr>
<tr>
<td>NCT04234097</td>
<td>Susan Hermanowski</td>
<td>Non-invasive Trans-cranial Electrical Stimulation (tDCS)</td>
<td>Age 20-85 yrs - ≤6mos from injury - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>15</td>
<td>Phase 1: Phase 2</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Shenzhen, China</td>
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<tr>
<td>NCT04235679</td>
<td>McGuire Research Institute</td>
<td>Spinal cord stimulation using an implanted epidural stimulator combined</td>
<td>Age 20-85 yrs - ≤6mos from injury - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>5</td>
<td>Phase 2</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Shenzhen, China</td>
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<tr>
<td>NCT04236814</td>
<td>University of Louisville</td>
<td>Non-invasive Trans-cranial Electrical Stimulation (tDCS)</td>
<td>Age 20-85 yrs - ≤6mos from injury - SCI level T12-T7 - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>15</td>
<td>Phase 2: Phase 3</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Shenzhen, China</td>
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<tr>
<td>NCT04236838</td>
<td>Helsinki University Central Hospital</td>
<td>Brain Stimulation Therapy (BIST) using targeted magnetic fields</td>
<td>Age 20-85 yrs - ≤6mos from injury - SCI level T12-T7 - SCI duration ≤1yr</td>
<td>Recruiting</td>
<td>24</td>
<td>Phase 2: Phase 3</td>
<td>Technology</td>
<td>Efficacy</td>
<td>F/U 1d (immediately after intervention)</td>
<td>December 2019</td>
<td>November 24, 2019</td>
<td>December 24, 2019</td>
<td>Shenzhen, China</td>
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<td>NCT ID</td>
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<td>Criteria</td>
<td>Status</td>
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<td>Study Phase &amp; Design</td>
<td>Primary Intervention Type</td>
<td>Primary Potential Benefit</td>
<td>Outcome Measures and Follow Up</td>
<td>Start Date</td>
<td>First Posted</td>
<td>Last Updated</td>
<td>Location(s)</td>
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<tr>
<td>NCT03998527</td>
<td>RobertJeans and Agnes Hunt Orthopaedic and Spinal Nths Trust</td>
<td>Functional Electrical Stimulation (TES) to nerves supplying weakened UE muscles combined with the use of mobile arm supports to compensate for diminished strength and weakness</td>
<td>Age ≤ 65 yrs</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase: Not Applicable, Primary Purpose: Device Feasibility, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>General Health</td>
<td>Canadian Occupational Performance Measure (CPM)</td>
<td>September 15, 2019</td>
<td>May 2019</td>
<td>September 15, 2019</td>
<td>Toronto, ON, Canada</td>
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<tr>
<td>NCT04043715</td>
<td>University of Louisville</td>
<td>6: Transcutaneous Spinal Stimulation (tSS) alone, Activity-Based Locomotor Training (AB-LT) alone, and in combination (AB-LT + tSS)</td>
<td>Age 4-11 yrs</td>
<td>Recruiting</td>
<td>18</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>Blinding: Masking</td>
<td>Safety to take independent steps</td>
<td>June 2019</td>
<td>September 4, 2019</td>
<td>March 2020</td>
<td>Louisville, KY, USA</td>
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<tr>
<td>NCT04052776</td>
<td>Glasgow Caledonian University</td>
<td>FES Cycling with RT-300 ergometer up to 60 min sessions/week for 6 weeks vs. usual care typically including physiotherapy twice daily</td>
<td>Age ≥ 18 yrs</td>
<td>Recruiting</td>
<td>12</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Single Group Assignment, Masking: Single</td>
<td>Technology</td>
<td>Blinding: Masking</td>
<td>Ability to take independent steps</td>
<td>June 2019</td>
<td>August 21, 2019</td>
<td>August 21, 2019</td>
<td>Glasgow, UK</td>
</tr>
<tr>
<td>NCT04054440</td>
<td>Hanyang University Seoul Hospital</td>
<td>Goal training using IMX powered escalator 3 times a week for 10 weeks</td>
<td>Age ≥ 18 yrs</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase: Not Applicable, Primary Purpose: Device Feasibility, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Rehabilitation</td>
<td>Blinding: Masking</td>
<td>Imaging, SAE, Side Effects</td>
<td>August 2019</td>
<td>August 14, 2019</td>
<td>August 14, 2019</td>
<td>Seoul, South Korea</td>
</tr>
<tr>
<td>NCT04105772</td>
<td>Centre Hospitalier Universitaire Vaudois</td>
<td>Only administered laparoscopic and transperitoneal/bipolar taken individually and in combination with plow, by subjects who have completed the STIMO Study (NCT02365435) (see above) and are enrolled in the STIMO EOS extension study. 4 arms of subjects will receive all 4 (crossover)</td>
<td>Age ≥ 18 yrs</td>
<td>Recruiting</td>
<td>8</td>
<td>Phase: Phase I/II, Primary Purpose: Treatment, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Rehabilitation</td>
<td>Blinding: Masking</td>
<td>Imaging, SAE, Side Effects</td>
<td>May 2020</td>
<td>August 10, 2019</td>
<td>March 2, 2020</td>
<td>Lausanne, Switzerland</td>
</tr>
<tr>
<td>NCT04105911</td>
<td>Rehabilitation Science</td>
<td>12 sessions of 45 minutes 3-4 times per week of first-effect based gait training (THERA-Trainer lyra) vs. conventional gait training vs. 5 sessions of each intervention</td>
<td>Age ≥ 18 yrs</td>
<td>Recruiting</td>
<td>26</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Rehabilitation</td>
<td>Blinding: Masking</td>
<td>Functional Ambulation Category</td>
<td>September 2018</td>
<td>September 8, 2019</td>
<td>September 25, 2019</td>
<td>Basel, Switzerland</td>
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<tr>
<td>NCT04115160</td>
<td>BrainQ Technologies Ltd.</td>
<td>Physical Therapy run-in baseline with Machine Learning analysis of BISQAMS (BCI) and EMG patterns during functional motor tasks to create low-intensity, non-invasive patterned electromagnetic field (ESE) stimulation</td>
<td>Age 18-75 yrs</td>
<td>Recruiting</td>
<td>8</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>GRASP+ CUB+</td>
<td>August 2019</td>
<td>August 8, 2019</td>
<td>June 6, 2020</td>
<td>Miami, FL, USA; West Chester, PA, USA; Ramat Gan, Israel</td>
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<tr>
<td>NCT04117192</td>
<td>James J. Peters Veterans Affairs Medical Center</td>
<td>36 sessions of supervised Exoskeleton-assisted walking (SEW) using the Indego/Exoskeleton—3 4 sessions/wk for 12 weeks, 4-6 hours per week</td>
<td>Age ≥ 18 yrs</td>
<td>Recruiting</td>
<td>20</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Rehabilitation</td>
<td>Blinding: Masking</td>
<td>Safety, AE, OE, SAE, effects</td>
<td>August 2019</td>
<td>August 7, 2019</td>
<td>August 7, 2019</td>
<td>The Bronx, NY, USA</td>
</tr>
<tr>
<td>NCT04117241</td>
<td>University of Washington</td>
<td>Transcutaneous Spinal Stimulation (tSS) and Neurostimulation (tNS)</td>
<td>Age ≥ 17 yrs</td>
<td>Recruiting</td>
<td>8</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>Blinding: Masking</td>
<td>Neurovascular Recovery Scale</td>
<td>August 2018</td>
<td>August 2018</td>
<td>August 16, 2018</td>
<td>Seattle, WA, USA</td>
</tr>
<tr>
<td>NCT04122553</td>
<td>University of Louisville</td>
<td>6 Groups: 1) Transcutaneous electrical nerve stimulation (tNS), 2) Respiratory training (RT), 3) TdSCS-4HT, 4) TdSCS-4HT, 5) TdSCS-4HT training; 6) TdSCS-4HT training, 6) TdSCS to Non-Disabled control groups</td>
<td>Age ≥ 18 yrs</td>
<td>Recruiting</td>
<td>36</td>
<td>Phase: Not Applicable, Primary Purpose: Basic Science, Intervention: Single Group Assignment, Masking: Single</td>
<td>Technology</td>
<td>Blinding: Masking</td>
<td>Respiratory EMS, Pulmonary Function Spirometry</td>
<td>May 2018</td>
<td>July 28, 2018</td>
<td>June 26, 2019</td>
<td>Louisville, KY, USA</td>
</tr>
<tr>
<td>NCT ID</td>
<td>Sponsor</td>
<td>Intervention</td>
<td>Criteria</td>
<td>Status</td>
<td>Target Enrollment</td>
<td>Study Phase &amp; Design</td>
<td>Primary Intervention Type</td>
<td>Primary Potential Benefit</td>
<td>Outcome Measures and Follow up</td>
<td>Study Start Date</td>
<td>First Posted</td>
<td>Last Updated</td>
<td>Location(s)</td>
</tr>
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</tr>
</tbody>
</table>
| NCT03892746    | University of Louisville | Transcutaneous spinal stimulation with activity-based upper extremity training (75 sessions; 1.5 hours/session; stimulation will be applied intermittently with Bimodal-5 transcutaneous spinal stimulation for no more than 10 minutes at a time) | Age 4-18 yrs  
SC1 T1 or above  
Moderate/severe UE deficit  
Chronic SCI 1yr  
Discharged from inpatient rehab | Recruiting | 10  
Phase: Not Applicable  
Primary Purpose: Device Feasibility  
Intervention Model: Single Group Assignment, Masking: None (Open Label)  
Technology: General Health  
Safety/Feasibility  
- Skin Irritation  
- Arm Excursion, Grip Strength | F/U 12 months | November 2019 | July 25, 2019 | Louisville, KY, USA |
| NCT03922802    | University of Louisville | Transcutaneous spinal stimulation applied in combination with activity-based locomotor training (3 sessions; 1.5 hours/session; no more than 10 minutes at a time during training) | Age 2-15 yrs  
Level NS  
Traumatic or Non-traumatic SCI<15/50  
Chronic SCI  
Discharged from inpatient rehab | Recruiting | 10  
Phase: Not Applicable  
Primary Purpose: Device Feasibility  
Intervention Model: Single Group Assignment, Masking: None (Open Label)  
Technology: General Health  
Safety/Feasibility  
- Skin Irritation  
- Pain  
- Blood Pressure Requests to Drug/Compliance Trunk Kinematics | F/U 3 months | August 2019 | July 5, 2019 | August 20, 2019 | Louisville, KY, USA |
| NCT03924388    | University of Louisville | Transcutaneous spinal stimulation applied in combination with activity-based locomotor training (75 sessions; 1.5 hours/session; stimulation will be applied intermittently for no more than 10 minutes at a time during training) | Age 18-70 yrs  
SC1 T1-L5  
AS c  
- Able to maintain assisted standing  
Subacute, Chronic SCI<8mos  
Chronic SCI  
Discharged from inpatient rehab | Recruiting | 50  
Phase: Not Applicable  
Primary Purpose: Device feasibility  
Intervention Model: Crossover Assignment, Masking: Single  
Technology: Rehabilitation  
Standing/Walking Mobility  
- Balance  
- 10 Meter Walk Test  
- TMS Cortical Mapping | F/U 12 weeks | April 2019 | May 23, 2019 | May 30, 2019 | Toledo, Spain |
| NCT03930056    | University of Kentucky | 20 minute non-invasive Active vs. Sham brain stimulation (tDCS) sessions followed by 3 hours of intensive UE Motor Training. Number of sessions NS. | Age 18-65 yrs  
SC1 C4-C7  
AS c, D  
Chronic SCI 1yr  
Discharged from inpatient rehab | Recruiting | 56  
Phase: Not Applicable  
Primary Purpose: Treatment, Intervention Model: Parallel Assignment, Masking: Triple  
Technology: Am/Hand Function  
Motor Function  
- Motor Function  
- Functional Recovery  
- Pain | F/U 6 months | July 2019 | July 17, 2019 | July 18(2), 2019 | Lexington, KY, USA |
| NCT03954496    | University of Louisville | Must be able to walk in question spinal stimulation and training study. Various optional stimulation protocols will be performed with assessments of bowel function and QoL. | Age 18-70 yrs  
SCI Level NS  
AS c, A, B  
Cardiovascular & bowel dysfunction  
Chronic SCI1yr  
Discharged from inpatient rehab | Not yet recruiting | 36  
Phase: Not Applicable  
Primary Purpose: Treatment, Intervention Model: Crossover Assignment, Masking: None (Open Label)  
Technology: Bowel Health  
Gastro-Intestinal System  
- Bowel Habit  
- Bowel Diary  
- Wireless Bowel Motility Capsule  
- Blood Pressure | F/U 20 months | August 2019 | May 14, 2019 | Louisville, KY, USA |
| NCT03962218    | University of Louisville | C-Brace II use vs. traditional KAFO use. Follow-up evaluation and brace fitting, participants will receive 10-20 one hour training sessions with assigned brace, then transition to home use for 3 month period. | Age 18-70 yrs  
SC1 C4-C7  
AS c, D  
Cardiovascular & bowel dysfunction  
Chronic SCI1yr  
Discharged from inpatient rehab | Not yet recruiting | 50  
Phase: Not Applicable  
Primary Purpose: Supportive Care, Intervention Model: Parallel Assignment, Masking: None (Open Label)  
Technology: Bowel Health  
Gastro-Intestinal System  
- Bowel Habit  
- Bowel Diary  
- Wireless Bowel Motility Capsule  
- Blood Pressure | F/U 4 months | April 2019 | April 11, 2019 | May 1, 2020 | Chicago, IL, USA |
| NCT03975634    | University of Calgary | Short term (single 1 hour session) and long term (5 one hour sessions per week for 4 weeks) transcutaneous spinal cord stimulation, will also study autonomic function in a small group of subjects previously implanted with epidural stimulation. | Age 18-65 yrs  
SCI Level NS  
AS c, A, B, C, D  
Requires LE  
Orthotic training including knee for instability  
Chronic SCI 2mo(s)SCI 3mo(s)max  
Discharged from inpatient rehab | Not yet recruiting | 46  
Phase: Not Applicable  
Primary Purpose: Supportive Care, Intervention Model: Parallel Assignment, Masking: None (Open Label)  
Technology: General Health  
Blood Pressure  
- Blood Pressure  
- Heart Rate  
- Arterial Pressure  
- Blood Volume  
- Bowel Motility  
- Urodynamic Study  | F/U 4 months | February 2020 | April 23, 2019 | December 17, 2019 | Vancouver and Calgary, Canada |
| NCT04037314    | Shirley Ryan AbilityLab | Transcutaneous spinal cord stimulation (TSCS) during walking rehabilitation, in combination with acute intermittent hypoxia. | Age 2-9 mos  
SCI <6 mos  
- Level C2–C6  
- AIS A, B, C, D  
- No spasticity or a conversion within 6 months  
- No metal implants in the head or face  
- No implanted cardiac pacemaker or other pump  
- Requires LE | Not yet recruiting | 36  
Phase: Not Applicable  
Primary Purpose: Treatment, Intervention Model: Parallel Assignment, Masking: None (Open Label)  
Technology: Rehabilitation  
Standing/Walking Mobility  
- Balance  
- Gait Stability  
- 10 Meter Walk Test using V02 analysis | F/U 12 months | October 2021 | April 22, 2020 | September 1, 2020 | Chicago, IL, USA |
| NCT04082515    | The Third Affiliated hospital of Zhejiang Chinese Medical University | Electrostimulation, five daily 30 minute sessions per week for 12 weeks. Subjects may be randomized to either transcutaneous electrical stimulation + routine rehab or routine rehab alone | Age 18-55 yrs  
Cervical SCI  
AS c, D  
- Grade 1-3 strength in BLS  
Subacute SCI 14dSCI 3mo(s)  
Discharged from inpatient rehab | Recruiting | 84  
Phase: Not Applicable  
Primary Purpose: Treatment, Intervention Model: Parallel Assignment, Masking: None (Open Label)  
Technology: Other  
Standing/Walking Mobility  
- 10 Meter Walk Test using GaitRite  
- 10 Meter Walk Test using V02 analysis  
- 6 Minute Walk Test | F/U 6 months | June 2019 | April 10, 2019 | April 11, 2019 | Zhejiang Sheng, China |
| NCT04082774    | Shrewsbury Clinic US Department of Defense | Non-invasive brain stimulation (tDCS) (Transcranial Direct Current Stimulation) using (tDCS) to the area in the brain controlling the weaker muscle of the weak upper limb while receiving task-oriented training for 15 Session (Shrews X Series) | Age 18-75 yrs  
Cervical SCI Level NS  
AS c, D  
Ticasp strength of weaker UE is 1 grade weaker UE  
Chronic SCI 1yr  
Discharged from inpatient rehab | Recruiting | 44  
Phase: Not Applicable  
Primary Purpose: Treatment, Intervention Model: Parallel Assignment, Masking: None (Open Label)  
Technology: Am/Hand Function  
Motor Function  
- Motor Function  
- Functional Recovery  
- Pain | F/U 3 months | July 2019 | March 27, 2020 | 16.07.20 | West Orange, NJ, USA |
<table>
<thead>
<tr>
<th>NCT ID</th>
<th>Sponsor</th>
<th>Intervention</th>
<th>Criteria</th>
<th>Study Phase &amp; Design</th>
<th>Primary Intervention Type</th>
<th>Primary Potential Benefit</th>
<th>Outcome Measures and Follow Up</th>
<th>Study Start Date</th>
<th>First Posted</th>
<th>Last Updated</th>
<th>Location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT03669302</td>
<td>Synaptic Medical, Inc</td>
<td>Intracranial placement via the superior venous of setence (Stentrode™) into a vessel in the motor cortex of the brain.</td>
<td>Age 18–75 yrs, SCI level AS, AR, NS</td>
<td>Recruiting</td>
<td>5 Phase: Not Applicable</td>
<td>Technology</td>
<td>General Health</td>
<td>May 2019</td>
<td>February 8, 2019</td>
<td>22:06:20</td>
<td>Melbourne, VIC, Australia</td>
</tr>
<tr>
<td>NCT03680872</td>
<td>National Neuroscience Institute</td>
<td>Spinal cord stimulation (SCS) for the treatment of chronic SCI</td>
<td>Age 21 yrs or older</td>
<td>Recruiting</td>
<td>3 Phase: Phase I: Non-1:1</td>
<td>Technology</td>
<td>General Health</td>
<td>November 2017</td>
<td>January 22, 2019</td>
<td>22:06:20</td>
<td>Singapore</td>
</tr>
<tr>
<td>NCT03690726</td>
<td>City University of New York</td>
<td>Spinal Cord Injury Centre of Excellence</td>
<td>Age 18-65 yrs</td>
<td>Recruiting</td>
<td>9 Phase: Not Applicable</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>February 2018</td>
<td>October 28, 2018</td>
<td>22:06:20</td>
<td>Montréal, France</td>
</tr>
<tr>
<td>NCT03702842</td>
<td>Western Denmark</td>
<td>Spinal cord injury study with implantable microelectrode array</td>
<td>Age 18-65 yrs</td>
<td>Recruiting</td>
<td>6 Phase: Not Applicable</td>
<td>Technology</td>
<td>Sensory Aversion Signals</td>
<td>July 2019</td>
<td>October 22, 2018</td>
<td>22:06:20</td>
<td>Indianapolis, IN, USA</td>
</tr>
<tr>
<td>NCT03721861</td>
<td>University of Florida</td>
<td>Intracerebral direct current stimulation (IDCS) of the spinal cord utilizing Synapse Medical's NeuroStim™IDCS-stimulator over the low back during locomotor training</td>
<td>Age 18-65 yrs, SCI C1-T10</td>
<td>Recruiting</td>
<td>20 Phase: Not Applicable</td>
<td>Technology</td>
<td>Sensing/Monitoring</td>
<td>April 2019</td>
<td>October 11, 2018</td>
<td>22:06:20</td>
<td>Jacksonville, FL, USA</td>
</tr>
<tr>
<td>NCT03834857</td>
<td>Indiana University</td>
<td>Comparison of two different intensities of walking training (30 one-hour sessions in a health care environment and on-sets). High intensity training will target achievement of heart rate close to 80% of heart rate reserve</td>
<td>Age 18-65 yrs</td>
<td>Recruiting</td>
<td>6 Phase: Not Applicable</td>
<td>Technology</td>
<td>Sensing/Monitoring</td>
<td>August 2019</td>
<td>August 28, 2019</td>
<td>22:06:20</td>
<td>San Francisco, CA, USA</td>
</tr>
<tr>
<td>NCT04007634</td>
<td>University of California, San Francisco</td>
<td>System implantation of contact electrode to enable electroencephalography (ECoG) recording of brain activity</td>
<td>Age 18-65 yrs, SCI level T7-10</td>
<td>Recruiting</td>
<td>3 Phase: Not Applicable</td>
<td>Technology</td>
<td>General Health</td>
<td>August 2019</td>
<td>October 3, 2019</td>
<td>22:06:20</td>
<td>San Francisco, CA, USA</td>
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<tr>
<td>NCT04007702</td>
<td>spinal Cord Injury Centre of Western Denmark</td>
<td>Active vs. sham low-intensity blood-flow restricted exercise (SFRE); low-intensity strength training (25-30 % of max) while using circulatory cuffs during exercise adjusted to maintain arterial inflow to the muscles while preventing venous return</td>
<td>Age 18-120 yrs</td>
<td>Recruiting</td>
<td>28 Phase: Not Applicable</td>
<td>Technology</td>
<td>Sensing/Monitoring</td>
<td>May 2020</td>
<td>October 11, 2018</td>
<td>22:06:20</td>
<td>Ibbenbüren, Germany</td>
</tr>
<tr>
<td>NCT04007726</td>
<td>spinal Cord Injury Centre of Western Denmark</td>
<td>Active vs. sham Repeatitive transcranial magnetic stimulation (rTMS) combined with strength training/standard of care rehabilitation</td>
<td>Age 18-60 yrs</td>
<td>Recruiting</td>
<td>30 Phase: Not Applicable</td>
<td>Technology</td>
<td>Sensing/Monitoring</td>
<td>January 2019</td>
<td>October 1, 2018</td>
<td>22:06:20</td>
<td>Ibbenbüren, Germany</td>
</tr>
<tr>
<td>NCT04007772</td>
<td>Chad Bouton</td>
<td>Bilateral Neural Eegy System: Implantation of microelectrodes arrays into the primary motor cortex to record neural activity associated with desired movements and into the primary somatosensory cortex to record sensory activity associated with movements</td>
<td>Age 22-65 yrs</td>
<td>Recruiting</td>
<td>3 Phase: Not Applicable</td>
<td>Technology</td>
<td>General Health</td>
<td>September 2019</td>
<td>November 2, 2019</td>
<td>22:06:20</td>
<td>Manchester, NY, USA</td>
</tr>
<tr>
<td>NCT04007800</td>
<td>Ithaca University of New York</td>
<td>iECG system for 3D electrodiagnostic surface (surface electrode) stimulation in persons receiving motoric rehabilitation training to improve UE motor function after motor incomplete SCI</td>
<td>Age 18-80 yrs</td>
<td>Recruiting</td>
<td>45 Phase: Not Applicable</td>
<td>Technology</td>
<td>Sensing/Monitoring</td>
<td>August 2019</td>
<td>September 15, 2019</td>
<td>22:06:20</td>
<td>Brea, CA, USA</td>
</tr>
<tr>
<td>NCT04007824</td>
<td>Kathleen Foe</td>
<td>Spinal Assimilative Stimulation (SAS) with epidural and synchronized dual periperal nerve and brain stimulation (i.e. Paced Assimilative Stimulation (PAS) to enhance MEP amplitude in target muscles</td>
<td>Age 18-80 yrs</td>
<td>Recruiting</td>
<td>30 Phase: Not Applicable</td>
<td>Technology</td>
<td>Sensing/Monitoring</td>
<td>July 2013</td>
<td>July 16, 2018</td>
<td>22:06:20</td>
<td>Manhasset, NY, USA</td>
</tr>
</tbody>
</table>

Note: NCT refers to the National Clinical Trials ID, which is a unique identifier for clinical trials conducted in the United States. The columns represent various details about each trial, including the sponsor, intervention type, criteria for participation, study phase, primary intervention type, primary potential benefit, outcome measures and follow up, study start date, first posted date, and last updated date. Each row provides specific information about a different clinical trial.
NCT03385005  University of Zurich  Study Weight Supported (WSW) ground-based training: 4 weeks of training  
- Age 18-70 yrs  
- SCI above T2  
- Can walk 10m, 6MWT>300m  
- Chron: SCI-dm  
- Recruiting  
- Study Phase: 30  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Parallel Assignment: Masking: Single (Open Label)  
- Primary Intervention Benefit: Standing/Walking/Mobility  
- Study Completion: 6MWT/TUG  
- F/U: 2 months  
- September 2018  
- March 2019  
- May 2, 2018  
- First Posted:  
- Last Updated:  
- Location(s): Switzerland

NCT03399968  Brooks Rehabilitation  locomotor training with (Cybathlon Inspired Adeptus Limb (IL), and locomotor training (overground or with or without the HAL device) 60 sessions (5 days/week for 12 weeks):  
- Age 18-80 yrs  
- Level NS  
- AIS B, C, D  
- Can walk 10h  
- Chron: SCI-dy  
- Recruiting  
- Study Phase: 24  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment: Masking: None (Open Label)  
- Primary Intervention Benefit: Technology  
- Study Completion: 6MWT/6SMG  
- F/U: 12 weeks  
- November 2018  
- March 20, 2020  
- Last Updated:  
- Location(s): USA

NCT03452007  4th Office of Research and Development  Recruitment to record cortical activity to train the development of brain activity correlated with appropriate grasp patterns, utilizing visual reality and FES controlled hand movement. Eligible subjects must have been successful participants in BrainGate2 trial:  
- Age NS  
- SCI with UE impairment  
- Neuronopt implant Brangial'd participant  
- Chron: SCI  
- Time post SCI NS  
- Recruiting  
- Study Phase: 6  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment: Masking: None (Open Label)  
- Primary Intervention Benefit: Technology  
- Study Completion: Arm/Hand Function  
- F/U: 1 year  
- June 2018  
- March 29, 2018  
- August 19, 2020  
- Location(s): USA

NCT03504826  University of Louisville  Transcranial non-invasive Magnetic Stimulation targeting late indirect descending volleys (TMS) (vs sham TMS), acute to sub-chronic, randomized, double-blind, placebo-controlled trial with 10 electrode array allowing determination of stimulation parameters and electrode configurations that result in improved bladder capacity and voiding efficiency (using quantitative EMG/ADL):  
- Age 18-85 yrs  
- SCI above CB  
- AIS B, C, D  
- Viable postUE movement ability: Chron: SCI-dy  
- Recruiting  
- Study Phase: 300  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Crossover Assignment: Masking: Single (Open Label)  
- Primary Intervention Benefit: Technology  
- Study Completion: Brief Visual Functional Incontinence Questionnaire Single  
- F/U: 60 minutes  
- January 2020  
- February 27, 2018  
- June 4, 2020  
- Location(s): USA

NCT03520525  Center of Medical Technology Aarhus University Hospital RegionHospitalet  Induction of upper limb motor patterns in persons with SCI:  
- Age 18-55 yrs  
- SCI T1-L1  
- AIS B, C, D  
- Functional Gait (incl with braces): Chron: SCI  
- Recruiting  
- Study Phase: 40  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Parallel Assignment: Masking: Single (Open Label)  
- Primary Intervention Benefit: Technology  
- Study Completion: Standing/Walking/Mobility  
- F/U: 2 years  
- June 2020  
- February 28, 2020  
- August 12, 2020  
- Location(s): Denmark

NCT03572919  MyndHeal Inc  Motorafford therapy, a non-invasive FES technique using surface electrodes to stimulate 3-5 muscles to produce purposeful movement in the arms/hands, compared to conventional recommended therapy:  
- Age 18-65 yrs  
- SCI T5-L1  
- AIS B, C  
- Chron: SCI-dy 12m  
- Recruiting  
- Study Phase: 10  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Parallel Assignment: Masking: None (Open Label)  
- Primary Intervention Benefit: Technology  
- Study Completion: Standing/Walking/Mobility  
- F/U: 12 months  
- January 2018  
- February 22, 2018  
- March 2, 2019  
- Location(s): USA

NCT03688202  ADOS Research Institute  In vivo extended (AVEM) 1 hour treatment sessions once to twice a week for 12 weeks:  
- Age 18-75 yrs  
- Any SCI Level  
- AIS NS  
- F/U: 220x3a  
- Chron: SCI-dy  
- Recruiting  
- Study Phase: 40  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Parallel Assignment: Masking: Single (Open Label)  
- Primary Intervention Benefit: Technology  
- Study Completion: Arm/Hand Function  
- F/U: 4 weeks  
- April 20, 2020  
- April 30, 2020  
- Multisite Canada/USA

NCT03742164  UVA Trauma Center  

NCT03795007  McGuire Research Institute  

NCT03813282  VA Office of Research and Development  MyndMove® therapy, a non-invasive neuromuscular electrical stimulation (NMES) at the injury level and 5 stimulation site:  
- Age 18-80 yrs  
- SCI level NS  
- ≥ 36 Grade 0-2 finger strength  
- Stable cervical SCI  
- Any SCI Level  
- Chron: SCI  
- Recruiting  
- Study Phase: 36  
- Primary Intervention Type: Phase, not Applicable, Primary Purpose: Treatment, Intervention Model: Parallel Assignment: Masking: None (Open Label)  
- Primary Intervention Benefit: Technology  
- Study Completion: General Health  
- F/U: 20 months  
- November 2017  
- June 11, 2020  
- Location(s): USA
<table>
<thead>
<tr>
<th>NCT ID</th>
<th>Sponsor</th>
<th>Intervention</th>
<th>Criteria</th>
<th>Status</th>
<th>Target Enrollment</th>
<th>Study Phase &amp; Design</th>
<th>Primary Intervention Type</th>
<th>Primary Potential Benefit</th>
<th>Treatment, Intervention</th>
<th>Outcome Measures and Follow Up</th>
<th>Study Start Date</th>
<th>Last Updated</th>
<th>Location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT02937741</td>
<td>Shepherd Center, Atlanta, GA</td>
<td>Lengthening/intensity motor skills training (with and without sham) transcranial (via scalp electrodes) direct current stimulation (TDCS) of the motor cortex of the brain, to improve walking function. Three 25-30 minute training sessions, baseline and follow-up assessments sessions.</td>
<td>Age 18-65 yrs SC T10 and above</td>
<td>Recruiting</td>
<td>15</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Parallel Assignment, Masking: Single</td>
<td>Technology</td>
<td>Standing/Walking ability</td>
<td>10mW</td>
<td>5 times sit to stand</td>
<td>March 2017</td>
<td>August 2, 2017</td>
<td>Atlanta, GA, USA</td>
</tr>
<tr>
<td>NCT02978638</td>
<td>Indiana University</td>
<td>High intensity stepping training in multiple environments, including on a treadmill and on stairs. High intensity non-stripping training, including balance, strength, and cycling tasks. 20 sessions over a 6-week period.</td>
<td>Age 18-75 yrs SCI C1-T10</td>
<td>Recruiting</td>
<td>20</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Parallel Assignment, Masking: None (Open Label)</td>
<td>Rehabilitation</td>
<td>Standing/Walking ability</td>
<td>10 Minute Walk Test</td>
<td>July 2017</td>
<td>May 8, 2017</td>
<td>Indianapolis, IN, USA</td>
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<tr>
<td>NCT03053791</td>
<td>Vanderbilt University</td>
<td>Omega locomotor walkers; Three Minimum walking sessions per week for 8 weeks (24 sessions).</td>
<td>Age 18 yrs SCI level N5</td>
<td>Recruiting</td>
<td>75</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>Standing/Walking ability</td>
<td>10 Minute Walk Test</td>
<td>March 2016</td>
<td>February 6, 2017</td>
<td>Houston, TX, USA</td>
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<tr>
<td>NCT03057652</td>
<td>The University of Texas Health Science Center, Houston</td>
<td>Algorithmically-based evaluation and treatment approach for expanding robotic stimulation (SIF) gait training using Riftpace, Dorsis, and REX systems. Randomly assigned order of device use. Up to 13 training sessions per device.</td>
<td>Age 18-75 yrs SCI T10 &amp; above</td>
<td>Recruiting</td>
<td>5</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>Standing/Walking ability</td>
<td>10 Minute Walk Test</td>
<td>February 2017</td>
<td>February 17, 2017</td>
<td>Zürich, Switzerland</td>
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<tr>
<td>NCT03237234</td>
<td>University of Zurich</td>
<td>UniMedri implantation of a Medtronic Active SCI deep brain stimulation system in the mesencephalic locomotor region</td>
<td>Age 22 yrs SCI level NS</td>
<td>Enrolling by invitation</td>
<td>5</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: None (Open Label)</td>
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<td>Manual Muscle Testing</td>
<td>F/U 6 months</td>
<td>February 7, 2017</td>
<td>February 12, 2017</td>
<td>Lausanne, Switzerland</td>
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<td>NCT03530744</td>
<td>Helsinki University Central Hospital</td>
<td>Planted associative stimulation (PAS) using transcranial magnetic stimulation (TMS) directed on the sensorimotor cortex, to improve gait and balance in SCI patients with incomplete SCI.</td>
<td>Age 18-75 yrs SCI level NS</td>
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<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>Manual Muscle Testing</td>
<td>F/U 1 year after stimulation</td>
<td>February 2017</td>
<td>January 20, 2020</td>
<td>Helsinki, Finland</td>
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<tr>
<td>NCT03533721</td>
<td>University of Minnesota</td>
<td>Implanted epidural spinal cord stimulators for improving voluntary motor activity, and autonomic function in persons with chronic motor complete SCI, comparing outcome with stimulator on vs. off (sham stimulation).</td>
<td>Age 20 yrs SCI C4-T10</td>
<td>Recruiting</td>
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<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>General Health</td>
<td>Brain Motor Control Assessment</td>
<td>August 2017</td>
<td>July 17, 2020</td>
<td>Minneapolis, MN, USA</td>
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<td>NCT03534118</td>
<td>Shirley Ryan AbilityLab</td>
<td>Thigh arm-study comparing cortical/palpable/force perturbation treadmill training with 5 actions (1) sham transcortical spinal direct current stimulation (TDCS), and 2) standard treadmill training only. Three treadmill sessions per week for 6 weeks.</td>
<td>Age 18-65 yrs SCI C4-T10</td>
<td>Recruiting</td>
<td>54</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: Single</td>
<td>Technology</td>
<td>Standing/Walking ability</td>
<td>10 Minute Walk Test</td>
<td>November 2016</td>
<td>December 13, 2016</td>
<td>Chicago, IL, USA</td>
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<tr>
<td>NCT03593139</td>
<td>Pan Abi Vicasa’s Institute for Research</td>
<td>Rehabilitation of Friedreich Ataxia using a wearable assistive robot. The study tests the use of the system to aid balance and gait in Friedreich Ataxia patients.</td>
<td>Age 18 yrs SCI below C6</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: None (Open Label)</td>
<td>Technology</td>
<td>Balance</td>
<td>Biodexpeak (standing)</td>
<td>December 2016</td>
<td>December 4, 2019</td>
<td>Pal Abi and son Jose, USA</td>
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<td>NCT03593145</td>
<td>Josephy Bloch</td>
<td>Implanted closed-loop Epidural Electrical Stimulation (EES) combined with over-ground robot assisted rehabilitation training (DRMT) for improving ambulation in persons with chronic incomplete SCI.</td>
<td>Age 18-65 yrs SCI T10 and above</td>
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<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention Model: Single Group Assignment, Masking: None (Open Label)</td>
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<td>Standing/Walking ability</td>
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<td>Criteria</td>
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<td>Target Enrollment</td>
<td>Study Phase &amp; Design</td>
<td>Primary Intervention Type</td>
<td>Primary Potential Benefit</td>
<td>Outcome Measures and Time Line</td>
<td>Study Start Date</td>
<td>First Posted</td>
<td>Last Updated</td>
<td>Location(s)</td>
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<td>NCT01491789</td>
<td>University of Southern California</td>
<td>Motor Control Training (3 times a week for 12 wk at slow speed) to evaluate the effect of slow-speed training on hip function. Comparing untrained controls vs. locomotor trained SCI without and with hip post-rehabilitation</td>
<td>Age 18-80 yrs</td>
<td>Recruiting</td>
<td>32</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Model: Parallel Assignment: Single</td>
<td>Rehabilitation</td>
<td>Standing/Walking/Ability</td>
<td>6-month walk test</td>
<td>June 2013</td>
<td>July 4, 2016</td>
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<td>NCT01894802</td>
<td>Shirley Ryan AbilityLab</td>
<td>Study of motor task training with new rail system stimulation assessing electrophysiological parameters of time domain and location</td>
<td>Age 18-85 yrs</td>
<td>Recruiting</td>
<td>350</td>
<td>Phase: Not Applicable, Primary Purpose: Diagnostic, Intervention: Model: Cross-over Assignment: Single</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>Functional tests of arm/hand function</td>
<td>May 2020</td>
<td>May 22, 2015</td>
<td>March 17, 2020</td>
<td>Chicago, IL, USA</td>
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<tr>
<td>NCT01923662</td>
<td>Richard A. Andersen, PhD</td>
<td>Use of a closed-loop neuroprosthetic system (SMR) for arm, hand and trunk function.</td>
<td>Age 17-75 yrs</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Model: Single Group Assignment: None (Open Label)</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>Arm and Hand Function</td>
<td>July 2013</td>
<td>December 3, 2014</td>
<td>July 5, 2016</td>
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<td>NCT02329652</td>
<td>Kevin Kilgore</td>
<td>Use of implanted epidural electrodes for spinal cord stimulation in combination with a drug (bupropion) to improve arm and hand function in subjects with non-progressive SCI above C5</td>
<td>Age 18-50 yrs</td>
<td>Recruiting</td>
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<td>Phase: Not Applicable, Primary Purpose: Basic Science, Intervention: Model: Single Group Assignment: None (Open Label)</td>
<td>Technology</td>
<td>General Health</td>
<td>Patient control of舵电动 (virtual or physical)</td>
<td>November 2011</td>
<td>October 11, 2013</td>
<td>October 31, 2015</td>
<td>Menlo Park, CA, USA, Los Angeles, CA, USA, Pasadena, CA, USA</td>
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<tr>
<td>NCT02465389</td>
<td>Richard A. Andersen, PhD</td>
<td>Implementation of two neuroprosthetic electrodes in post-SCI subjects to allow direct brain-control of a computer interface. ultimate objective is to allow the patient autonomous control over the single declawed rotating mechanical claw.</td>
<td>Age 19-75 yrs</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase: Not Applicable, Primary Purpose: Device Safety, Intervention: Model: Single Group Assignment: None (Open Label)</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>Subject control of keypad computer (virtual or physical)</td>
<td>October 2013</td>
<td>October 8, 2013</td>
<td>October 2016</td>
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<td>NCT02545320</td>
<td>IVF Office of Research and Development</td>
<td>Device: SCI-10 (10-Channel implanted stimulator) for standing in persons with SCI above T5 from neurological disorder such as low thoracic/spinal cord injury (SCI- T1-T5)</td>
<td>Age 18-75 yrs</td>
<td>Recruiting</td>
<td>10</td>
<td>Phase: Not Applicable, Primary Purpose: Device Safety, Intervention: Model: Single Group Assignment: None (Open Label)</td>
<td>Technology</td>
<td>Standing/Walking/Ability</td>
<td>Subject control of treadmill computer (virtual or physical)</td>
<td>April 2013</td>
<td>August 15, 2013</td>
<td>August 10, 2020</td>
<td>Cleveland, OH, USA</td>
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<tr>
<td>NCT02518540</td>
<td>Michael Brownridge</td>
<td>Implementation of microelectrode Cortical Recording and Stimulation (CRS) array in the motor cortex and parietal cortex of the brain for manual activity recording and near control of external devices</td>
<td>Age 18-75 yrs</td>
<td>Recruiting</td>
<td>5</td>
<td>Phase: Not Applicable, Primary Purpose: Other, Intervention: Model: Single Group Assignment: None (Open Label)</td>
<td>Technology</td>
<td>Arm/Hand Function</td>
<td>Safety</td>
<td>December 2013</td>
<td>July 10, 2016</td>
<td>March 27, 2020</td>
<td>Pittsfield, PA, USA</td>
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<td>NCT02658541</td>
<td>MetroHealth Medical Center</td>
<td>Implementation of spinal cord expiratory muscle stimulator which helps to restore cough</td>
<td>Age 18-75 yrs</td>
<td>Recruiting</td>
<td>16</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Model: Single Group Assignment: None (Open Label)</td>
<td>Technology</td>
<td>General Health</td>
<td>Peak Expiratory Flow</td>
<td>April 2015</td>
<td>August 8, 2012</td>
<td>September 2, 2016</td>
<td>Cleveland, OH, USA</td>
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<td>NCT02698513</td>
<td>Louis Stokes VAMC</td>
<td>Device: IFS-16 (16-Channel implanted neural stimulation) to study the effect of functional electrical stimulation of the hip, knee and ankle muscles to improve walking in people with partial paraplegia</td>
<td>Age 18-75 yrs</td>
<td>Recruiting</td>
<td>6</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Model: Single Group Assignment</td>
<td>Technology</td>
<td>Standing/Walking/Ability</td>
<td>Analysis of speed, distance and quality of walking</td>
<td>April 2013</td>
<td>April 22, 2013</td>
<td>March 14, 2018</td>
<td>Ypsilanti, MI, USA</td>
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<td>NCT02698513</td>
<td>Louis Stokes VAMC</td>
<td>Device: IFS-16 (16-Channel implanted neural stimulation) to study the effect of functional electrical stimulation of the hip, knee and ankle muscles to improve walking in people with partial paraplegia</td>
<td>Age 18-75 yrs</td>
<td>Recruiting</td>
<td>20</td>
<td>Phase: Not Applicable, Primary Purpose: Treatment, Intervention: Model: Single Group Assignment: None (Open Label)</td>
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<td>Standing/Walking/Ability</td>
<td>Analysis of speed, distance and quality of walking</td>
<td>May 2011</td>
<td>December 14, 2011</td>
<td>February 21, 2020</td>
<td>Baltimore, MD, USA</td>
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</table>

**Outcome Measures and Time Line:**

- **Standing/Walking/Ability:**
  - 6-month walk test
  - Frontal hip loading response
  - Footdrop Recovery Scale
  - Berg Balance
  - Gilat Score

- **Arm and Hand Function:**
  - Functional tests of arm/hand function
  - Cortical Neurophysiology
  - Upper limb movements scale

- **Motor Control Training:**
  - 3 times a week for 12 weeks
  - 10-meter walk test
  - Frontal hip loading response
  - Footdrop Recovery Scale
  - Berg Balance

- **Arm and Hand Function:**
  - Functional tests of arm/hand function
  - Cortical Neurophysiology
  - Upper limb movements scale

- **Safety:**
  - 10-meter walk test
<table>
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<th>NCT ID</th>
<th>Sponsor</th>
<th>Intervention</th>
<th>Criteria</th>
<th>Status</th>
<th>Target Enrollment</th>
<th>Study Phase &amp; Design</th>
<th>Primary Intervention Type</th>
<th>Primary Potential Benefit</th>
<th>Outcome Measures and Follow Up</th>
<th>Study Start Date</th>
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<th>Location(s)</th>
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<td>NCT00912041</td>
<td>US Dept of Veterans Affairs</td>
<td>Implantation of the one or two BrainGadgets sensor electrode arrays into the</td>
<td>Cervical SCI, AIS A, B, C, D, alive ≤24hr, time post SCI ≤3 hrs</td>
<td>Recruiting</td>
<td>15</td>
<td>Not Applicable, open</td>
<td>Technology</td>
<td>Safety, Feasibility of BrainGate2</td>
<td>F/U 1 year</td>
<td>March 2009</td>
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<td>Stanford, CA, USA</td>
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<td>NINDS</td>
<td>motor cortex; training implanted subjects to control a computer cursor and</td>
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<td>other assistive devices with their thoughts</td>
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<td>NCT00623389</td>
<td>Case Western Reserve</td>
<td>Device: IST-16 (16-channel implanted stimulation), trained pre and post-</td>
<td>C6-T12, range of motion normal; chronic SCI ≥6 months</td>
<td>Recruiting</td>
<td>10</td>
<td>Not Applicable, open</td>
<td>Technology</td>
<td>Standing, walking, mobility</td>
<td>Standing, walking and balance performance, ability to perform other functional activities of daily living</td>
<td>June 2018</td>
<td>February 26, 2008</td>
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<td>University NIH</td>
<td>surgical training to facilitate exercise, standing, stepping and balance in</td>
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<td>people with various degrees of paralysis</td>
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</table>
### Terms/Abbreviations

- AH1: Acute Intermittent Hypoxia. Short duration (<2 min) exposure to breathing reduced oxygen concentration levels (~10% inspired oxygen), with alternating exposures to breathing air with normal oxygen concentration (~21% inspired oxygen).
- AIS: the ASIA (American Spinal Injury Association) Impairment Scale is a component of the NINCSCI that classifies the degree of motor/sensory sparing below the level of injury. The AIS scale ranges from A (most severe, complete injury without sensory function in the lowest sacral segments) to E (normal).
- AIS B describes sensory only sparing. AIS C describes sensory and very weak motor sparing. AIS D describes sensory and stronger but not normal motor sparing.
- Ashworth/Modified Ashworth: a scale used to measure spasticity severity.
- Barthel Index: a measure of performance in Activities of Daily Living (ADL) and Mobility.
- Box and Block Test: a test of manual dexterity—how many blocks a person can grasp and transfer in one minute.
- Central Cord Syndrome/Cervical Central Cord Syndrome: motor incomplete cervical SCI in which the upper extremities are significantly more impaired than the lower extremities.
- COPM: Canadian Occupational Performance Measure.
- DASH: Disability of Arm, Shoulder, Hand scale is a measure of the upper extremity function.
- EMG: the electromyogram refers to a physiological test of muscle and nerve function.
- ESWT: extracorporeal shock wave therapy. Delivery of sound wave energy to the spinal cord using a transducer applied to the skin (extracorporeal i.e. outside of the body).
- FIM: Functional Independence Measure was developed to measure the burden of care in persons who were not independent in ADL, hygiene/self-care, and mobility. The FIM and its subscales have been used as an outcome measure of a subject's independence.
- Frankel Scale: an older scale for classifying severity of injury that was modified in 1992 to create the AIS.
- GRASSP: Graded Redefined Assessment of Strength, Sensibility, and Prehension is a clinical measurement of upper limb function for use in person with tetraplegia (quadriplegia).
- HDI: Humanitarian Device Exemption is a U.S. Food & Drug Administration (FDA) application that, if successful, authorizes the applicant to market a Humanitarian Use Device (HUD) subject to certain profit and use restrictions.
- HUD: Humanitarian Use Device is a designation of the U.S. FDA for medical devices intended to benefit patients in the treatment or diagnosis of a disease or condition that affects or is manifested in fewer than 4,000 persons in the United States per year.
- HUDs cannot be sold for profit, except in narrow circumstances, and they can only be used in a facility after an Institutional Review Board has approved their use in that facility except in certain emergencies.
- IFU: follow-up.
- ISNCSCI: International Standards for Neurological Classification of Spinal Cord Injury—sometimes referred to as the ASIA (American Spinal Injury Association) standards. This refers to the accepted international standards for performing motor/sensory physical examination of persons with SCI and the classification scheme for documenting the neurological level and the severity (completeness) of injury.
- IT: intrathecal, within the subarachnoid space surrounding the spinal cord-i.e. administration of a drug into the subarachnoid space which contains the cerebrospinal fluid (CSF)
- IV: Intravenous—administration of a drug by vein.
- Kinesics: analysis of movement.
- KLD Scale: a 10-grade Roman numeral locomotion scoring system describing ability to stand, ability to walk, and required support/devices.
- N/A: not applicable.
- NS: not specified.
- Perf: Perfusion.
- Press: pressure.
- RCT: Randomized Controlled Trial. A clinical trial in which subjects are randomly assigned to either receive an active treatment or an alternative (control). Well-designed RCT's minimize the influence of variables other than the intervention that might have an effect on the desired outcome.
- Pharmacokinetics: study of the absorption, distribution, metabolism, and excretion of drugs; commonly involving periodic sampling of bodily fluids (e.g. blood, serum, CSF, urine) to determine drug concentration changes over time.
- Phase of Study: Clinical Trials usually progress in phases from 1 to 4. (Note: trials that are not on the path to FDA regulatory approval (e.g. trials of surgical/techniques or rehabilitation therapies) may not have a phase designation.)
  1. Phase 1 trials are usually first-in-human or first-in-disease/condition experiments that are intended to demonstrate feasibility (can it be done), safety (is it reasonably safe), and tolerability (are the side effects tolerable). These trials usually do not include a comparison control group, and do not provide direct evidence of the interventions efficacy. Phase 1 trials usually enroll a small number of subjects and are commonly done at a single study center but may use a small number of collaborating centers.
  2. Phase 2 trials follow successful completion of Phase 1. Phase 2 trials are used to develop information on intervention administration (how to give), dose (how much to give), timing (when and how long to give), effect of the intervention on the body (what does it do, beneficial or harmful).
  3. These trials commonly utilize multiple study centers, many subjects, and a randomized control group to provide direct evidence about efficacy and safety of the intervention. Phase 2 trials enable refinement of how to administer the intervention and how to measure its beneficial effects.
  4. Phase 3 trials are conducted using the refined protocols developed from Phase 2 trials. They are often termed "pivotal" studies because they are sufficiently well-designed and rigorously conducted that their results, if positive, can be used for regulatory approval (e.g. FDA approval).
  5. These trials almost always enroll large numbers of subjects (hundreds or more), use multiple study centers, and a randomized control group design (placebo control and double blinding). The FDA generally requires two successful confirmatory Phase 3 trials of an intervention for approval.
- Pharmacokinetics: study of absorption, distribution, metabolism, and excretion of drugs; commonly involving periodic sampling of bodily fluids (e.g. blood, serum, CSF, urine) to determine drug concentration changes over time.
- Open Label: a trial in which there is no attempt to conceal the identity of the intervention from the subjects; i.e. there is no "blinding" or "masking" of the intervention— the subjects know that they are receiving either an "active ingredient" or a placebo.
- Post-Operative: the time that begins immediately after the surgical procedure and extends to a variable point in time that is determined by the clinician.
- Primary Outcome: the specific clinical measurement that is the key outcome variable for measuring the effect of the intervention. The primary outcome is specified in advance of the study and is determined by the clinician.
- Primary Endpoint: the specific clinical measurement that is the key outcome variable for measuring the effect of the intervention. The primary endpoint is specified in advance of the study and is determined by the clinician.
- Priority Uses: humanitarian devices.
- Reference: nation-wide estimates are obtained from the NINDS database.
- Secondary Endpoint: any outcome measurement that is collected during the study and that is not the primary outcome measurement.
- SF-36: the Short Form-36 is a patient-reported survey of health status. The SF-36 is commonly used as a measure of Health-Related Quality of Life.
- SCI Trials Finder: a publicly available online database that lists clinical trials and clinical study information for SCI populations.
- SCI Trials Finder.net: SCI Trials of Rehabilitation and Technological Interventions to Improve Functional Outcomes.
- SCIM/SCIM II/SCIM III: the Spinal Cord Independence Measure is a measure of a person's ability to perform certain activities independently. The SCIM is the most recent version of the SCIM.
- The most rigorous RCT's utilize a placebo group and blinding (concealing active vs. control assignment) to minimize bias in the interpretation of study results.
- TRMS/UEMS/LEMS: Total Motor Score/Upper Extremity Motor Score/Lower Extremity Motor Score are components of the ISNCSCI that include the ASIA Motor Index Score (the TRMS) and the sub-components of the UEMS and the LEMS which are commonly analyzed and reported separately.
- Tardieu Scale: test of spasticity by assessing muscle resistance to passive movement at both slow and fast speed.
- TMS: Total Motor Score.
- VAS: Visual Analogue Scale—a scale commonly used to assess the severity of pain.
- WAP: Wingate Anaerobic Power.
- X: number of digits.
- Y: number of digits.
- Z: number of digits.
- 6MWT: a test of manual dexterity.
- ASN: SPMSMMSCM 3SCM 3ICSM 3INCI 3ISC: the Spinal Cord Independence Measure is a measure of a person's ability to perform certain activities independently.
- SF-36: the Short Form-36 is a patient-reported survey of health status. The SF-36 is commonly used as a measure of Health-Related Quality of Life.
- TMS/UEMS/LEMS: Total Motor Score/Upper Extremity Motor Score/Lower Extremity Motor Score are components of the ISNCSCI that include the ASIA Motor Index Score (the TMS) and the sub-components of the UEMS and the LEMS which are commonly analyzed and reported separately.
- Treadmill scale: test of spasticity by assessing muscle resistance to passive movement at both slow and fast speed.
- VAS: Visual Analogue Scale—a scale commonly used to assess the severity of pain.
- X: number of digits.
- Y: number of digits.
- Z: number of digits.