Spinal Cord Outcomes Partnership Endeavor (SCOPE, www.scope-sci.org)
Current SCI Clinical Trials for Interventions to Improve Neurological Function

Revised May 11, 2013

Sponsor/NCT	Intervention	Inclusion/ Exclusion Criteria	Treatment Timing & Follow-up	Enrollment	Phase of Study	Primary Outcome	Comments
Asubio Pharmaceuticals NCT01502631	IV drug SUN13837 daily for 28d. vs. placebo	18-80yr Age C4-C7 AIS A, 16-70yrAge C3-C8 AIS B, C LEMS≤5	Acute SCI SCI≤12hr 26wk F/U	Began 1/2012 USA/Canada 164 subjects	Phase 2 RCT Double Blind Placebo Controlled	Efficacy/Safety ISNCSCI examination AIS A: 2 motor level improvement AIS B, C: LEMS≥40	Responder Definition: AIS A: 2 Motor Level Improvement AIS B, C: LEMS≥40
Acorda Therapeutics NCT01750684	IV study med every 6 hrs x 5; AC105 vs. Placebo; i.e. 6 doses over 30 hours	18-65yr Age C4-T11 AIS A, B, C	Acute SCI SCI≤12hr F/U 6 m	Not begun N. America 40 Subjects	Phase 2 RCT	Safety/Tolerability: comparison of Adverse Event data between groups	Study to determine safety, tolerability and potential activity of AC105
AOSpine N. Am Research Network NCT01597518	Riluzole 2 x 100 mg by mouth or feeding tube the first 24 hours followed by 2 x 50 mg for the following 13 days after injury vs. placebo in acute SCI	18-75 yr Age C4-C8 AIS A, B, C	Acute SCI SCI≤12 hours F/U 6m	Beginning 5/2013 N. America Multicenter 351 subjects	Phase 2/3 RCT Double-Blind	Efficacy/Safety Change in ASIA total motor score from baseline to 6months of F/U	Multicenter Phase 3 trial of riluzole vs. placebo for improving motor recovery in acute SCI
Rick Hansen Institute U of Calgary Alberta Paraplegia Foundation NCT01828203	Twice Daily IV Minocycline vs. Placebo for over seven days All patients receive decompressive spine surgery and Blood Pressure management per protocol	≥16yr Age C0-C8 AIS A, B, C, D	Acute SCI SCI≤12 hours F/U 12m	Not begun Canada 248 subjects	Phase 3 RCT	Efficacy/Safety ISNCSCI Motor Score recovery from baseline to examination between 3m and 1yr post injury; ISNCSCI Sensory Scores AIS; SCIM; QoL: SF-36	800 mg initial dose tapered 100mg each dose to 400mg then continued twice daily x 7days
Hadassah Medical Org NCT01813240	Minocycline vs. Placebo; dose and route of administration not specified	18-65yr Age SCI: AIS B, C, D Spinal Tumors causing cord compression	Not Specified: Treatment Initiation Treatment Duration F/U Duration	Not begun Israel 444 subjects	Phase2/3 RCT	Efficacy/Safety ASIA score (ISNCSCI) comparison from baseline to 6 months follow-up; SCIM, FIM	Prevention of Imminent Paralysis Following Spinal Cord Trauma or Ischemia by Minocycline
Hospital Nacional de Paraplejicos de Toledo (Spain) NCT01329757	daily SQ human Growth Hormone vs placebo dosing for 1 yr; 6 months of rehab	18-75yr Age C4-T12 AIS B,C	Chronic SCI >18m SCI 1 yr F/U	Began 4/2011 Spain 76 subjects	Phase 3 RCT Placebo Controlled	Efficacy/Safety ISNCSCI motor sensory examination; SCIM	Test of 1yr of daily SQ Growth Hormone to improve neuro outcome in chronic incomplete
Kessler Foundation; NIDRR; Acorda Therapeutics NCT01621113	Oral dalfampridine (Sustained release 4-aminopyridine) vs. placebo for 10 weeks in chronic motor incomplete SCI receiving locomotor therapy	18-70 yr Age C4-T10 AIS C, D	Chronic SCI SCI>12m F/U 22wks	Began 6/2012 New Jersey 46 subjects	Phase 2 RCT Double-Blind	Change in 6 minute walk test at 10 weeks and 22 weeks F/U	Test of whether dalfampridine improves walking outcomes in chronic motor incomplete SCI

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Nordic Life Science Pipeline Inc. NCT01484184	Oral dosing of SPINALON (buspirone + levodopa + cardidopa); vs. placebo	18-65yr Age C3-T12 SCI AIS A, B	Chronic SCI SCI≥3m F/U 4hr post administration	To begin 5/2012 Canada 51 subjects	Phase 1/2 RCT Double Blinded Placebo Controlled	Safety/Tolerability Vital Signs Rhythmic Leg EMG	Multiple arms testing SPINALON vs. combination of drugs vs. placebo
Rehab Inst Chicago (RIC) NCT01753882	Escitalopram (Lexapro) 10mg PO Daily x 4 weeks vs Placebo in patients enrolled in gait training regimen (3x per wk for 6 wks—2 wks prior to initiation of study med, then 4 wks combined gait training and study med)	18-75yr Age SCI C1-T10 AIS C, D 1-9m post SCI	Subacute/Chronic 1m≤SCI≤9m	Began 2/2012 Chicago 88 subjects	Phase 1 Randomized Double Blinded Crossover	Safety/Efficacy WISCI Peak Treadmill Velocity 6 Minute Walk LEMS	Studying the combined effects of gait training and escitalopram on motor function and ↑ in locomotor capability
University of Miami NCT01739023	Surgical implantation of autologous Schwann Cells	18-50yr Age Acute SCI within 5d Thoracic T3-T11 AIS A	Acute SCI Cell Harvest<5Days Cell Implant ≤42 Days F/U for 1yr	Began 11/2012 Miami, USA 8 subjects	Phase 1 Single Group Open Label	Safety/Efficacy Change in ISNCSCI Exam from baseline to 12 months MRI Imaging of the Spinal Cord Neuropathic Pain measure Others: SCIM, FIM, Neurophysiology, autonomic, etc.	Safety study of Schwann Cells taken from patient by Sural N. Biopsy, processed, then surgically implanted into the area of SCI no more than 42 days post-SCI
Stem Cells, Inc NCT01321333	Surgical Implant of HuCNS-SC cells (Human Neural Stem Cells) into the area of spinal cord injury; implant followed by 9 months of immunosuppressive therapy	18-60yr Age T2-T11 AIS A, B, C	Chronic SCI >6 weeks post SCI 1yr primary F/U 4 yr additional F/U	Began 4/2011 Switzerland 12 subjects	Phase 1/2 Open Label	Safety and Tolerability/ Exploratory Efficacy	Safety and Preliminary Efficacy of Spinal Cord Transplantation of HuCNS-SC
Neuralstem, Inc. NCT01772810	Surgical injection of Neural Stem Cells into the area of SCI; 6 injections per patient; two dose cohorts 100,000 cells in 10µL/injection and 200,000 cells in 10µL/injection; patients receive immunosuppressive treatment for 3 months after implant	18-65yr Age T2-T12 AIS A	Chronic SCI 1yr≤SCI≤2yr 5yr F/U	Not begun USA Multisite 8 subjects	Phase 1 Open Label	Safety Incidence of Adverse Events Graft Survival (MRI evidence) ISNCSCI exam	To determine safety of human spinal stem cell transplantation for treatment of paralysis and related SCI symptoms
Memorial Hermann NCT01328860	Autologous Bone Marrow Cell Infusion (IV)	1-15 yr Age Neuro-stable All levels; AIS A-D	Chronic SCI 6m-4Yr SCI 6m F/U	Began 4/2011 Texas 10 subjects	Phase 1 Open Label	Feasibility/Safety ASIA (ISNCSCI) Exam neuropathic pain rating	Pediatric Trial
Pharmicell Co. Ltd. NCT01676441	Bone Marrow-derived autologous mesenchymal stem cells surgically transplanted intrathecally and directly into spinal cord injury following laminectomy; Implant followed by 4 weeks of rehabilitation	16-65yr Age Chronic SCI Cervical level AIS B Stable neuro after 1 m rehab	Chronic SCI SCI≥12m F/U 12m after surgery	Began 8/2008 S. Korea 32 subjects	Phase 2/3 Single Group Open Label	Efficacy/Safety ASIA Motor Score ASIA Sensory Score EMG, Neurophysiology MRI Adverse events	Ongoing study of autologous BM derived Stem Cells followed by 4 weeks of rehabilitation

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Guangzhou General Hospital/Guangzhou Military Command NCT01446640	IV and IT autologous bone marrow derived mesenchymal stem cell infusions	16-60yr Age Thoracic or Lumbar SCI AIS A, B	Subacute/Chronic 2wk<SCI<1yr	Began 10/2011 China 20 subjects	Phase 1/2 Open Label	Safety: Adverse Events Efficacy: Frankel Scale ASIA motor sensory exam EMG/Neurophysiology	Non-randomized Single Group
Max Institute of Neurosciences NCT01730183	Bone Marrow-derived autologous stem cell by intrathecal surgical transplantation	18-60yr Age SCI below C4 SCI 6m to 8yr prior AIS A, B, C	Chronic SCI Between 6m and 8yr F/U 18m	Began 11/2012 India 15 subjects	Phase 1/2 Single Group Open Label	Safety/Efficacy Number of Adverse Events ISNCSCI (ASIA) scores SCIM III Pain, Ashworth	Cells obtained by bone marrow aspiration are surgically implanted intrathecally
Chaitanya Hospital, Pune NCT01833975	Intrathecal transplantation of Bone Marrow-derived autologous stem cell; 100 million cells/dose; 3 doses over 10 days	18-55yr Age SCI below C4 AIS A-D	Time post SCI Not Specified F/U 6m	Began 3/2011 India 50 Subjects	Phase 1/2 Single Group Open Label	Safety/Efficacy Improvement in Frankel score Improvement in ASIA (ISNCSCI)	Study the Safety and Efficacy of Bone Marrow Derived Autologous Cells for Treatment of SCI
Bukwang Pharmaceutical NCT01624779	Intrathecal Transplantation Of Autologous Adipose Tissue-Derived Mesenchymal Stem Cells in Patients With SCI	19-70 yr Age Unchanged neuro status over 4weeks No possibility of improved neuro function	Subacute-chronic Unchanged neuro status over 4 weeks	Began 4/2012 South Korea 15 subjects	Phase 1 Single Group Open Label	Significant change in MRI from baseline to 6m F/U; Significant neuro and electrophysiological change at 6m	Open label Phase 1 trial of Intrathecal transplant of autologous adipose MSCs in severe SCI
RNL Bio Company; Korea University Anam Hospital NCT01769872	Intravenous, Intrathecal and Intramedullary Injection of Autologous Adipose Tissue-Derived Mesenchymal Stem Cells	19-70 Yr Level not specified AIS A, B, C	Chronic SCI SCI≥3m F/U 6m	Began 1/2013 South Korea 15 Subjects	Phase 1/2 Single Group Open Label	Adverse Events ASIA (ISNCSCI) MRI MEP/SSEP (QoL) SF-36	IV, IT, Intramedullary injection of Adipose-derived MSC in chronic complete and incomplete SCI
General Hospital of Chinese Armed Police Forces NCT01393977	IT infusion of Umbilical cord blood stem cells Rehabilitation of limb function	20-50yr Age Traumatic SCI (not specified)	Rx timing not specified 1yr F/U	Began 1/2011 China 60 subjects	Phase 2 Single Group Open Label	EMG/Neurophysiology BAEP (brainstem) NCV	Non-randomized multiple group comparison
Tokyo University NCT01485458	Early (<24h) vs. Delayed (>2wk) Decompression surgery for acute cervical SCI without bony injury	20-79yr Age C5 or below AIS C tetraplegia No bone injury; Pre-existing cervical canal stenosis	Acute/Subacute Admitted within 48 hours of SCI 1yr F/U	Began 12/2011 Japan 100 subjects	Phase 1/2 RCT Open Label	Safety/Efficacy ISNCSCI motor sensory examination; SCIM; walking ability	Test of whether timing of spinal cord decompression is associated with neurological outcome in SCI without fracture/dislocation

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North Florida/South Georgia Veterans Health System NCT01272011	Locomotor training ±Hypoxia treatment	≥18yr Age C5-T11 AIS C, D O_2sat 95-99% walks±assist	Chronic SCI SCI≥12m F/U 2wk	Began 5/2010 Florida, USA 41 subjects	Not specified; RCT; Placebo Controlled	Minute ventilation; Propulsion generated during stepping	Test of whether hypoxia (1/3 less O_2 than room air) will improve walking
Emory University NCT01272349	Acute intermittent hypoxia (low oxygen) vs. Room air (normal oxygen) placebo	18-65yr Age C6-T12 AIS C, D Ambulate with minimal assist No sleep apnea Not getting PT	Chronic SCI SCI>12m F/U 1wk	Began 10/2010 Atlanta, Chicago 40 subjects	Phase 1 RCT Double Blinded Placebo Controlled Crossover	Walking Performance (not specified)	Test of whether exposure to intermittent hypoxia will improve walking in ambulatory chronic incomplete SCI
Emory University NCT01272336	Acute intermittent hypoxia (low oxygen) vs. Room air (normal oxygen) placebo	18-65yr Age C6-C8 AIS C, D No sleep apnea Not getting PT	Chronic SCI SCI>12m F/U 1wk	Began 12/2010 Atlanta 40 subjects	Phase 1 RCT Double Blinded Placebo Controlled Crossover	Hand Grasp Grip Strength	Test of whether exposure to intermittent hypoxia will improve hand function in chronic incomplete tetraplegia
Raboud University NCT01367405	Surgical Decompression Versus Conservative Treatment in Incomplete SCI without spinal instability	≥18 yr Age Incomplete SCI without spinal instability	Acute SCI SCI≤24hr F/U 2yr	Began 1/2012 Netherlands 72 subjects—must speak Dutch	Phase not specified	Functional outcome at 2yr post injury based on Japanese Orthopedic Association assessment; arm and hand function by questionnaire	RCT of acute surgical spinal decompression vs. conservative management in patients with incomplete SCI

This table is abstracted from the clinical trial registration website www.clinicaltrials.gov using the search term "Spinal Cord Injury" and is updated quarterly. The most recent update occurred on May 11, 2013 at which time the www.clinicaltrials.gov search found a total of 504 SCI trials. Of these 203 were categorized as "open" with a subset of 172 that had known status as currently recruiting or not yet recruiting. The table includes 25 SCI trials from the search that: 1) are currently actively recruiting or soon-to-be recruiting subjects; 2) are interventional (tested an intervention/treatment) using drugs, cell therapies, surgery, or hypoxia; and 3) targeted neurological or related functional improvement as outcome measures.

Interventional clinical trials are routinely registered on www.clinicaltrials.gov based on legal requirements* and because scientific journals may require registration for publication of the trial results. Investigators may choose not to register some early phase trials and those testing behavioral interventions, even though they may be important and scientifically rigorous studies.

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***U.S. Public Law 110-85 requires the registration and reporting of results of "certain applicable clinical trials," i.e., controlled interventional clinical trials that are subject to FDA regulation and that involve a Drug or Biologic (other than Phase I investigations), or Device (other than small feasibility studies); http://prsinfo.clinicaltrials.gov/fdaaa.html.**

Terms/Abbreviations

NCT number: all trials registered with www.clinicaltrials.gov are assigned a registration number that begins with NCT (e.g. NCT01321333). The number listed for the trials in the table can be used in the search field to access the webpage describing the trial, the study centers, and contact information.

Phase of Study: Clinical trials usually progress in phases from 1 to 4.

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). Phase 1 trials usually do not include a comparison control group and as such, 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). Phase 2 trials commonly utilize multiple study centers, many subjects, and include a randomized control group to provide direct information 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 (what Outcome Measurement to use).**
3. **Phase 3 trials are conducted using the refined protocols developed from Phase 2 trials. Phase 3 trials are often termed "pivotal" studies because they are sufficiently well-designed and rigorously conducted that their results, if positive, can be used to make the case for regulatory approval (e.g. trials that lead to FDA approval for clinical use). Phase 3 trials almost always enroll large numbers of subjects (in the hundreds or more), use multiple study centers, and randomized control group design (with placebo control and double blinding if feasible). The FDA generally requires two successful confirmatory Phase 3 trials of an intervention for approval.**
4. **Phase 4 trials are conducted after regulatory (e.g. FDA) approval to gather additional safety and efficacy data.**

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" of the intervention—the subjects know that they are receiving the "active ingredient" rather than a placebo.

RCT: Randomized Controlled Trial—a clinical trial in which subjects are randomly (like flipping a coin) assigned to either receive the 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. For this reason, they provide the best evidence of efficacy and safety. The most rigorous RCT's utilize a placebo (inactive) control group and blinding (concealing active vs. control assignment) to minimize bias in the interpretation of study results.

IV: intravenous—administration of a drug by vein

IT: intrathecal—administration of a drug into the spinal fluid

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SQ: subcutaneous—administration of a drug by injection beneath the skin

F/U: 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 spinal cord injury and the classification scheme for documenting the neurological level and the severity (completeness) of injury.

AIS: the ASIA (American Spinal Injury Association) Impairment Scale is a component of the ISNCSCI that classifies the degree of motor/sensory sparing below the level of injury. The AIS scale ranges from A (most severe, complete injury with no sparing of sensory/motor function in the sacral segments S4-S5 that innervate the anus/rectum) 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.

Frankel Scale: an older scale for classifying severity of injury that was modified in 1992 to create the AIS.

SCIM: the Spinal Cord Independence Measure is a measure of a person's ability to perform certain activities independently; i.e. an outcome measure of a research subject's independence in the performance of a variety of specific activities.

EMG: the electromyogram refers to a physiological test of muscle and nerve function.