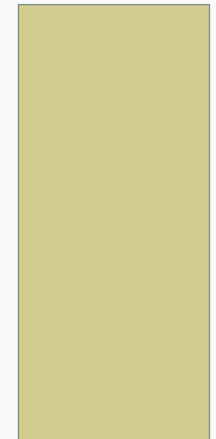




CAN I WALK AGAIN?

WEBINAR, APRIL 10, 2014



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HAVE A QUESTION?

▼ Questions

Type question here.

Send



www.theMiamiProject.org

www.NeurotechNetwork.org



The Miami Project is dedicated to finding more effective treatments and, ultimately, a cure for paralysis resulting from spinal cord injury.



Helping people regain life thru neurotechnology

Focusing on education of and advocacy to access neurotechnology devices, therapies and treatments for people living with impairments, their care-givers and medical professionals.



DISCLAIMER PAGE

The information presented in this session is not meant to replace the advice from a medical professional. You should consult a health care professional familiar with your specific case, concerns and condition. We highly suggest for you to take information to a trained medical professional familiar with your case to discuss options that are best for you.



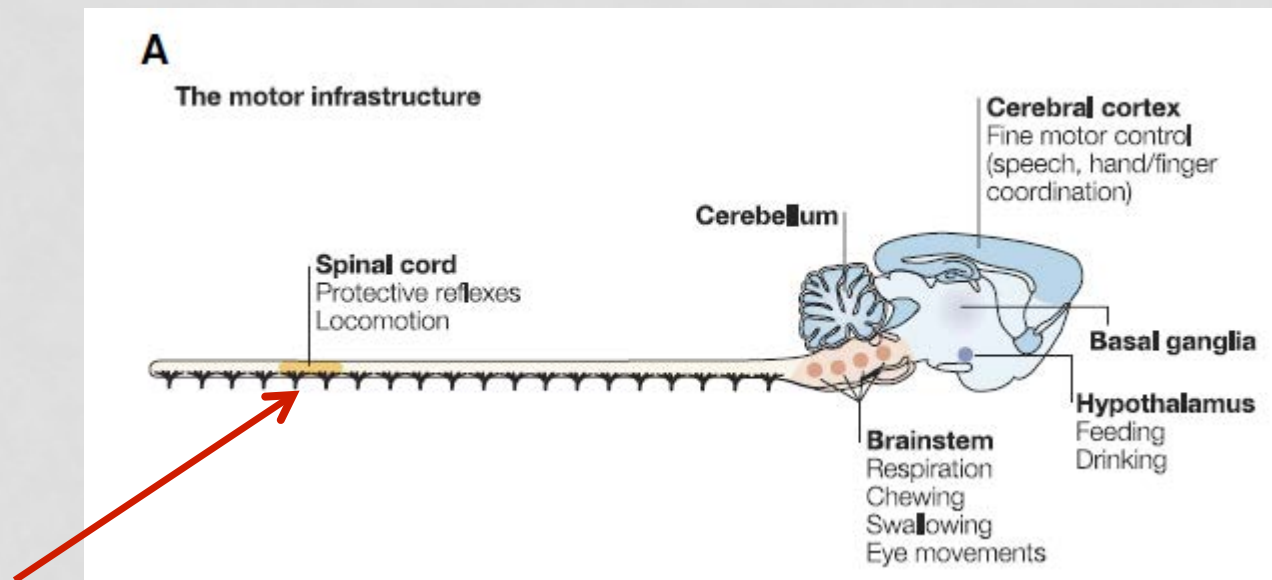
AGENDA

- Will it be like before?
- Therapeutic vs. Prosthetic Application
- Benefits & Risks Consideration
- Technology Description and Supporting Research
- How to Access & Programs



WHY LOCOMOTOR TRAINING?

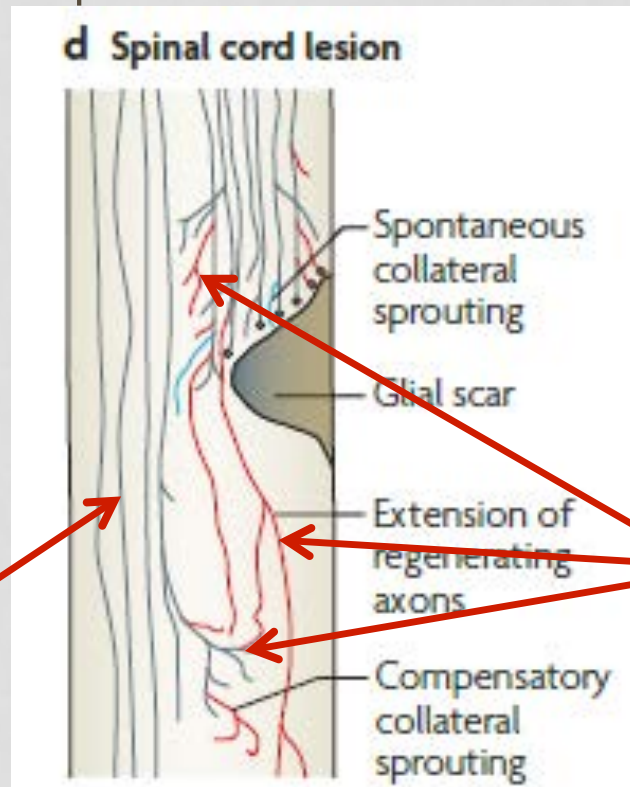
- Main principle – provide the injured spinal cord with input to stimulate the remaining spinal cord network even after the connections with the brain are damaged



Roy et al., 2012

WILL IT BE LIKE BEFORE?

- Probably not exactly like before
 - Circuitry of the spinal cord is incredibly complex
 - Reorganization is possible



Schwab et al., 2010



WILL IT BE LIKE BEFORE?

- Regaining walking function may not solve all issues
 - Sensation and pain
 - Bladder, bowel, sexual function
 - Temperature and blood pressure regulation
 - Efficiency of movement



Many spinal cord injured persons prefer a wheelchair to walking with braces and crutches.



THERAPEUTIC VERSUS PROSTHETIC

- Therapeutic Application: Rehabilitative approach designed to facilitate the process of recovery from injury, illness, or disease to as normal a condition as possible.
- Focus is
 - Restoration/recovery
 - Voluntary controland
 - Community Orientation
- Prosthetic Application: Tool used to compensate or replace lost function.
- Focus is
 - Improve health condition
 - Compensatory measures and
 - Prevention/performance



BENEFITS OF WALKING

- Reduced Spasticity
- Cardiovascular/Pulmonary Health Improvements
- Circulatory
- Bladder/Bowel Management
- Pressure Sore Prevention
- Mental Health
- Musculoskeletal Health
 - Muscle, bone, etc.



RISKS

- Increase potential for falls and bone fractures
- Sit to Stand low BP
- May be limited by contractures
- Unrealistic expectations can lead to lower QOL
- Increase of chronic pain
 - Shoulder pain

TECHNOLOGY DESCRIPTIONS

- Body-weight Support Systems combined with Repetitive Motion Therapy
- Exoskeletons
- Electrical Stimulation



Body weight supported (BWS), repetitive motion, locomotor training

Treadmill training & manual assist



Body weight supported (BWS), repetitive motion, locomotor training

Treadmill training & stimulation assist



Body weight supported (BWS), repetitive motion, locomotor training

Robotic assist (Lokomat)



BODY WEIGHT SUPPORTED (BWS), OVERGROUND, LOCOMOTOR TRAINING

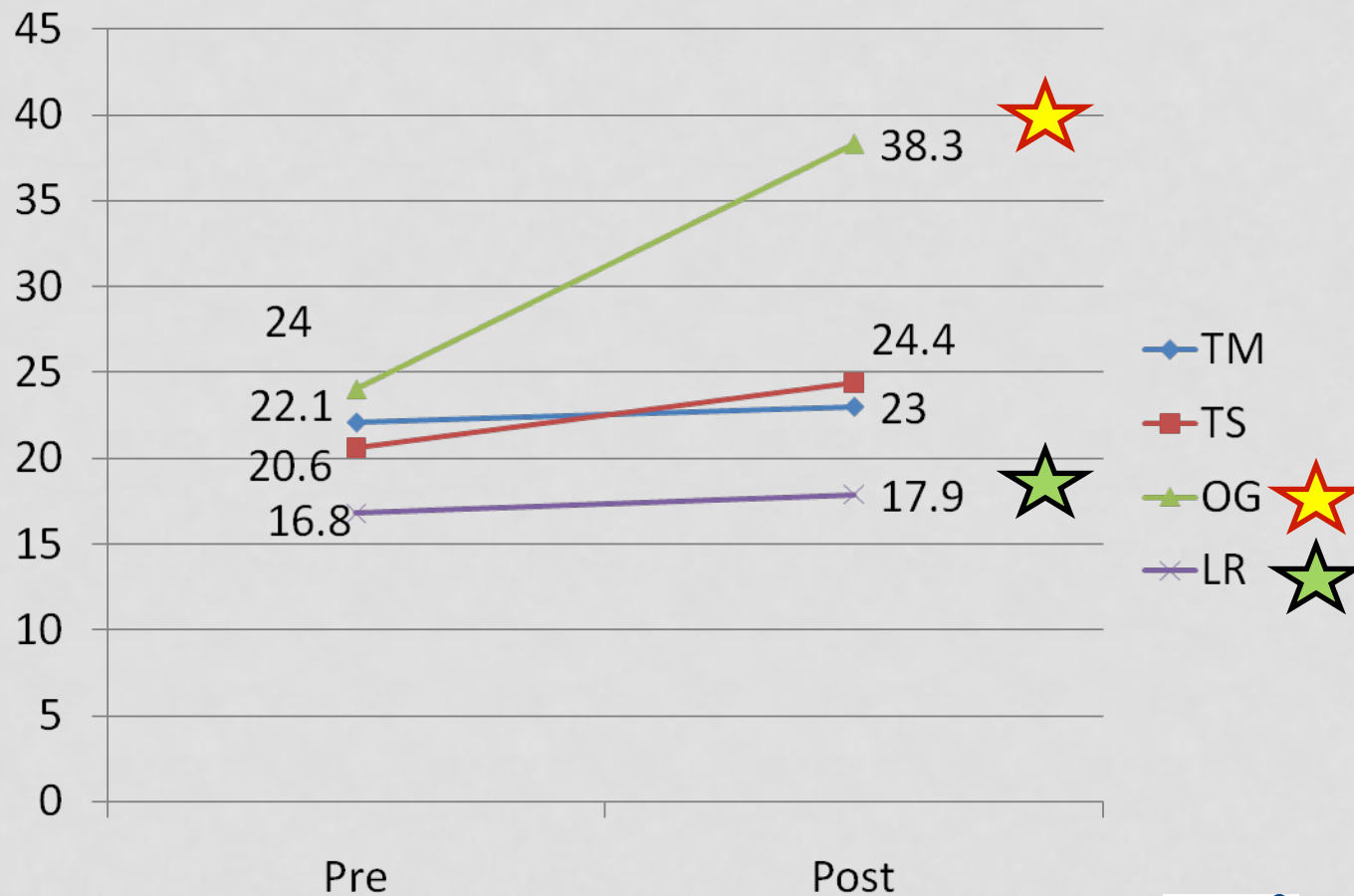
Over ground training



Changes in Walking Speed



Changes in Walking Distance



Whole Body Vibration & Locomotor Training



- Significant reduction in quadriceps spasticity
- Improvement in walking parameters

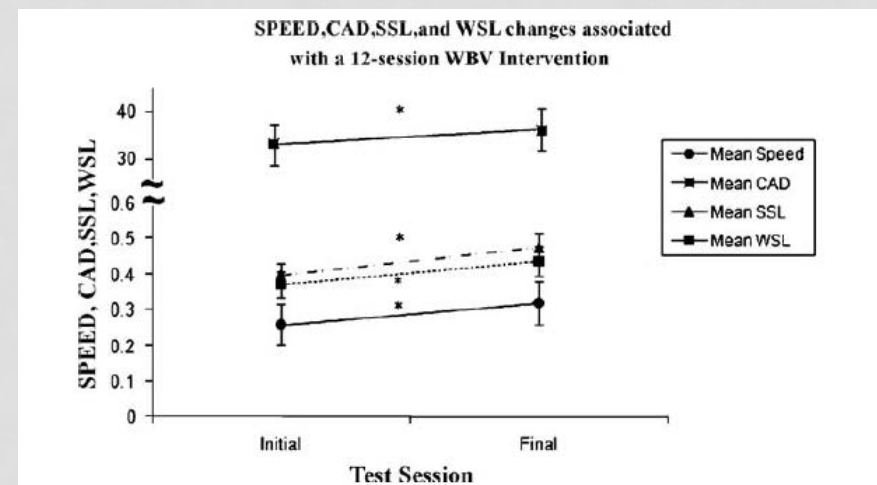


Fig. 3. Group mean changes in walking speed (SPEED; m/s), change in walking cadence (CAD; steps/min), and change in weak (WSL) and strong (SSL) step lengths (m) after a 12-session whole-body vibration (WBV) intervention. CAD, WSL and SSL significantly decreased (*) after the 12-session intervention of WBV. These gait parameters contributed to the increase in SPEED. The y-axis values are dependent on the reported measure and are denoted as group mean \pm standard error bars. Note the break in the y-axis from 0.5 to 30 to accommodate for values of cadence.



EXOSKELETONS

- Cyberdyne

<http://www.cyberdyne.jp/>



- Ekso Bionics

www.eksobionics.com



- ReWalk

<http://rewalk.com>



- Indego

<http://indegoparker.com>



- REX Bionics

www.rexbionics.com



ELECTRICAL STIMULATION DROP FOOT STIMULATION

Bioness: L300, L300T
www.bioness.com



Innovative
Neuronetics:
WalkAide
www.walkaide.com

Odstock – OFDS
www.odstock.com



Brindley-Finotech -
StimuStep
[http://finetech-
medical.co.uk/](http://finetech-medical.co.uk/)



ELECTRICAL STIMULATION ALTERNATIVE SYSTEM

Commercial Devices

Sigmetics/ParaStep
www.sigmetics.com

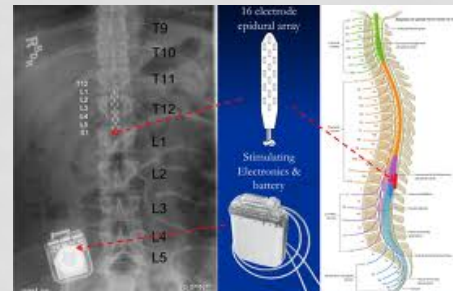


Axibionics/Wearable Therapies
www.axibionics.com



Research Devices

Implanted Neural
Prosthetic
www.fescenter.org



Epidural Stimulation
www.louisville.edu/medschool



HOW TO ACCESS?

- Purchase Personally
- Clinical or Post-Rehab Programs
- Clinical Trials



HOW TO ACCESS? HOSPITAL AFFILIATED

- Beyond Therapy - Atlanta, GA:
<http://www.beyond-therapy.org/>
- Brooks Rehab Neuro-Recovery Center - Jacksonville, FL:
<http://www.brookshealth.org/>
- NeuroRecovery Network – Several Locations:
<http://www.christopherreeve.org>
- PEAK Center – Englewood, CO: <http://www.craighospital.org/>
- Precision Rehabilitation – Long Beach, CA:
<http://precisionrehabilitation.com/>
- SHARE Program – Minneapolis, MN:
<http://www.couragecenter.org/>



HOW TO ACCESS? STAND ALONE PROGRAMS

- Buckeye Wellness Center: <http://www.buckeyewellnesscenter.com>
- C.O.R.E.-Northridge, CA: <http://corecenters.info/>
- Journey Forward – Canton, MA: <http://www.journey-forward.org/>
- NeuroXcel – North Palm Beach, FL: <http://www.neuroxcel.com/>
- Next Step Fitness – Lawndale, CA: <http://www.nextstepfitness.org>
- Project Walk – Several Locations: <http://www.projectwalk.org/>
- SCI-FIT - Sacramento, CA: <http://www.sci-fit.org/>
- The Recovery Project - Two Locations in MI:
<http://www.therecoveryproject.net/>
- Walk The Line – Southfield, MI: <http://walkthelinetoscirecovery.com/>



HOW TO ACCESS? CLINICAL TRIALS

ClinicalTrials.gov

www.ClinicalTrials.gov

National Library of Medicine & National
Institutes of Health

Possible Clinical Trial Search Terms

- Walking AND 'condition'
- Locomotor training
- Exoskeleton
- Robotic Therapy AND walking
- Electrical Stimulation AND walking
- Epidural Stimulation



APPENDIX B: What to ask before taking part in a clinical trial or human study? (your participation checklist)

Note: most of these questions should be answered during the informed consent process

Question	YES	NO	Additional Information
1. Safety			
a. Are there safety risks associated with this experimental treatment?			
b. Could my condition or my health get worse after this experimental treatment?			
c. If so, can you describe the possible risks associated with this experimental treatment?			
2. Possible benefits			
a. Can you describe the possible specific benefits of this experimental treatment?			
b. Can you describe the maximum level of recovery I might see after this treatment?			
c. Can you describe how any potential benefit will be measured?			
3. Clinical trial protocol			
a. Is this study registered as a clinical trial with an appropriate qualified regulatory body?			
b. Can you describe what clinical trial phase this particular human study falls within (Phase 1, 2, or 3) and what is the emphasis of study for this phase of the trial program?			
c. Is there a control group in this study?			
d. Could I be randomly assigned to the control group?			
e. Can you tell me how long I will be assessed for any change in outcome?			
f. Will I be blinded to whether I have received the experimental or control treatment?			
g. Will the investigators and examiners be blind to what treatment I have received?			

What to ask before taking part in a clinical trial or human study?



Question	YES	NO	Additional Information
4. Payments and costs			
a. Do I have to pay for this treatment?			
b. As a possible participant, are there other costs I have to pay to be involved in this study?			
c. Will my expenses associated with participating in this study be paid (e.g. travel to center for follow-up assessment)?			
5. Participation in Other Trials			
a. Will my participation in this clinical trial limit my participation in other SCI clinical trials?			
b. If I am assigned to the control group and the experimental treatment is subsequently shown to be an effective therapy for my type of SCI by this clinical trial program, will I be eligible to receive this treatment later?			
6. Preclinical or prior clinical evidence			
a. Can you describe the preclinical or prior clinical evidence that indicates this experimental treatment might be beneficial?			
b. Have these findings been independently confirmed by other researchers?			
c. Are there any dissenting opinions and do these arguments have some validity for not going forward with this treatment?			
7. Independent assessment of the treatment and investigator			
a. Can you provide me several names of scientists and clinicians (not involved with this study) who can provide me independent advice about this treatment and your reputation?			

What to ask before taking part in a clinical trial or human study?



QUESTIONS?

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