Locomotor Training (LT) in Pediatric Patients

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Proposed Research Question: Does Locomotor Training (LT) improve the functional quality of ambulation in children with incomplete spinal cord injuries (SCI)?

What is Locomotor Training (LT)?
- Body weight supported treadmill training (BWSTT).
- Promotes ambulation after incomplete SCI (B1).
- The damaged nervous system:
  - responds to sensory input
  - stimulates the remaining spinal cord networks
  - adapts behavioral output
  - reteaches the system through repetition (H).
- Stepping mechanics can be facilitated by:
  - manual assistance from therapist
  - robotic gait orthosis
  - electrical stimulation (Field-fote).
- Typically followed by “over ground training”

Pediatric Advantages
- Neurological recovery is better in children than adults (Parent).
- Pediatric patients are more neuroplastic.
- Longer window of opportunity to show improved outcomes.

What research has been completed?
- Ages ranged from 4.5-17 years old
- Protocol:
  - ranged from low to high intensities
  - Duration of training varied from 6 weeks to 6 months
  - Duration of treatment time per day ranged from 10-30 minutes
- ASIA Levels ranged from C to D during time of treatment

What patients does it benefit?
- Patients with incomplete SCI
  - Specifically American Spinal Injury Association (ASIA) Impairment Classification Scale Levels C and D.
- Other Diagnoses?
  - Cerebral Palsy, Down Syndrome, other central nervous system disorders, post stroke

What are the outcomes?
- Overall independence increased
- Reciprocal patterned leg movements developed (Fox).
- 2 years following LT patient maintained and improved walking function (Fox).
- Improvement in Walking Index for Spinal Cord Injury- Version II (WISCI-II) (Odonnell, prosser, berhman 1)
- Wheelchair bound patients improved quality of gait to the point of being full time ambulators (B2)
- General quality of life improved
- Lower Extremity Motor Score (LEMS) improved (prosser, odonnell)
- Systematic reviews conclude that LT provides small but positive effects in 29 studies synthesized (damiano)

Further Research Suggestions:
- The affect of LT on neuroplasticity of pediatric patients
- Protocol needs to be defined
- More randomized control trials with more participants
- More follow up studies (fox)
- Other therapies that can supplement LT

References:

https://pediatricapta.org/includes/fact-sheets/pdfs/Body-Weight-Supported-Treadmill.pdf