

Fostering Interlimb Coordination in Children and Adults with Hemiplegia

Orange County Stroke Rehab Network

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- I. Interlimb Coordination (ILC)
 - A. Temporal & spatial coupling
 - B. Essential to execute goal-oriented tasks
 - C. Symmetric – Asymmetric Motor Behaviors
- II. Influence of hemiparesis on interlimb coordination
 - A. Temporal lag or altered force production
 - B. Inefficiency
 - C. Compensation
 - D. Child / Adult examples
- III. Behavioral assessment of ILC
 - A. Assisting Hand Assessment
 - 1. Hand Assessment of Infants
 - 2. Kids-AHA 5.0
 - 3. Adolescent/Adult AHA Stroke
 - B. Other assessments (select items) i.e., WMFT
 - C. Advantages / Disadvantages
- IV. Quantitative assessment of ILC
 - A. Kinematics
 - B. Markerless systems (*i.e.*, *Kinect*)
 - C. Inertial sensors i.e., APDM Opal Sensors
 - 1. 3 Axes of data collection
 - a. Acceleration: Translational acceleration (m/s^2)
 - b. Gyroscope: Angular velocity (rad/s)
 - c. Magnetometer: Magnetic heading (μT)
 - 2. 20-200 Hz sampling rate / stream in real time or log data to download later
 - 3. Correlation with clinical assessments
- V. Pilot study (*J Chen, B Garrison, E Wade, University of Tennessee, Knoxville*)
- VI. Assessment of Interlimb Coordination
 - A. Collaborative study: *SV Duff (Chapman Un), ER Wade (Un of Tennessee, Knoxville), L Quinn (Columbia Un), H Ruthrauff (Children's Hospital of Philadelphia)*
 - B. Funding: *American Society of Neurorehabilitation; APTA Academy of Hand & Upper Extremity PT*
 - C. Purpose / Procedures
 - D. Preliminary findings
- VII. Intervention
 - A. Task-oriented Approach
 - 1. Enhancing resources
 - 2. Fostering alternate movement strategy
 - 3. Increasing function / participation
 - B. Discussion of clinical ideas

VIII. References

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