

of elite athlete specialization history reveal that for the majority of sports, late specialization with early diversification is most likely to lead to elite status. In addition, the same studies suggest that athletes who engage in sport-specific training at a young age have shorter athletic careers.

**Conclusions:** For most sports, intense training in a single sport to the exclusion of others should be delayed until late adolescence to optimize success while minimizing injury and psychological stress. Parents, clinicians and coaches need to work together with sport governing authorities to ensure healthy environments for play and competition that do not create long-term health issues.

**Key Words:** Intense training, Children, Specialization, Overtraining, Youth sports

**Disclosures:** None.

#### Systematic and Meta-Analytic Review Oral Presentation 310479

##### Lower Limb Orthotic Management of Paraplegia due to Spinal Cord Injury: A Clinical Practice Guideline

Phillip Stevens (Hanger Clinic), Curt Bertram, James Campbell

**Objectives:** To create succinct, evidence-based clinical practice guidelines for the lower limb orthotic management of paraplegia due to spinal cord injury.

**Data Sources:** A Medline search was conducted using the following search terms: "orthosis" AND "prosthetics," "spinal cord injury" OR "parapleg\*" AND "systematic review" OR "meta-analysis."

**Study Selection:** The original search yielded 103 abstracts. Of these, eight papers were identified that met our search criteria.

**Data Extraction:** Well-supported narrative statements were extracted from the identified source publications.

**Data Synthesis:** Several statements were considered within the domains of comparative efficacy, benefits and potential harms. Observations and considerations included relative energy consumption, gait speed, independence, balance, stability and ease of donning. These are summarized in the recommendations below Recommendation 1: Gait speed during orthosis assisted ambulation is similarly compromised with the use of mechanical, hybrid FES and externally powered orthoses among individuals with paraplegia due to spinal cord injury. Recommendation 2: At present, powered orthoses have demonstrated an ability to improve energy efficiency but not increase gait speed in subjects with SCI. Recommendation #3: Due to the associated compromise to trunk stability, for thoracic level SCI and resultant paraplegia, RGOs with a thoracic component enable both faster and more energy efficient ambulation than solutions distal to the waist (ie, MLOs), particularly if those devices are not linked (ie, bilateral Knee-Ankle-Foot-Orthoses). Recommendation #4: While not yet commercially available, research level hybrid FES orthoses are currently associated with increased energy costs, rapid muscle fatigue, decreased confidence and stability and difficult donning and utilization.

**Conclusions:** Clinical practice guidelines are "guides" only and may not apply to all patients and all clinical situations. Thus, they are not intended to replace clinical judgment in the provision of patient care.

**Key Words:** Orthosis, Spinal cord injury, Paraplegia, Clinical practice guideline

**Disclosures:** None disclosed.

#### Systematic and Meta-Analytic Review Oral Presentation 313638

##### Tai Chi for Balance and Falls Incidence in Neurological Disorders: A Systematic Review and Meta-Analysis

Stanley Winsler (The Hong Kong Polytechnic University), Priya Kannan, Karthikeyan Krishnamurthy, William Tsang

**Objectives:** To evaluate the effect of Tai Chi for improving balance and reducing falls incidence in people with neurological disorders.

**Data Sources:** Databases AMED, Embase, Web of science, SCOPUS, EBSCO, and Medline from their inception to August 2016.

**Study Selection:** Randomized controlled trials of Tai Chi compared with active or no treatment control measuring balance with the Berg Balance

Scale (BBS) or the Timed Up and Go test (TUG) and falls incidence as number of falls in people with neurological disorders were included.

**Data Extraction:** Two reviewers independently extracted data and assessed methodological quality using PEDro and quality of evidence using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) tool.

**Data Synthesis:** Nine studies involving 575 participants were reviewed. Seven studies were tested in people with Parkinson's disease and two were among stroke survivors. Of the nine included studies, six were of high methodological quality and three of low quality. The GRADE system provided high quality evidence for TUG and number of falls and low to moderate quality evidence for BBS in Parkinson's disease. The GRADE quality for TUG for stroke was moderate. Meta-analyses revealed statistically significant improvements in balance measured with TUG (WMD, -2.13 (95% CI -3.26,-1.00) p=0.0002) and reduced falls incidence (OR 0.47 (95% CI 0.29, 0.77, p=0.003) in Parkinson's disease. There was no significant effect of Tai Chi for balance measured with BBS (WMD 4.21 (CI 95% -1.98,10.39) p=0.18) in Parkinson's disease and TUG (WMD 0.45 (95% CI -3.43,2.54) p=0.77) in stroke.

**Conclusions:** Tai Chi is effective in reducing falls incidence in Parkinson's disease. No effect of Tai Chi was identified for improving balance in people with stroke.

**Key Words:** Nervous System Diseases, Tai Ji, Meta-Analysis, Accidental Falls

**Disclosures:** None disclosed.

#### Systematic/Meta-Analytic Review Posters

##### Systematic and Meta-Analytic Review Poster 281269

##### Ankle-Foot Orthosis in Duchenne Muscular Dystrophy: Experience in a Multidisciplinary Neuromuscular Clinic

Anupam Gupta (National Institute of Mental Health & Neuro Sciences-NIMHANS), Shanti Prakash Arya, Atchayaram Nalini

**Objectives:** To assess Ankle-Foot-Orthosis (AFO) requirement and ambulation in Duchenne Muscular Dystrophy (DMD) patients seen over a period of 4 years at a Multi-disciplinary Neuromuscular disorders clinic (NMD).

**Data Sources:** Reviewing records of DMD patients.

**Study Selection:** Patients with Diagnosed Duchenne Muscular Dystrophy attending Neuromuscular clinic regularly for the last 4 years in the institute.

**Data Extraction:** Study conducted in university quaternary research hospital with DMD patients confirmed by MLPA (multiplex ligation? dependent probe amplification) method and evaluated between January 2012 and December 2015. Their ambulatory status, detailed neurological and functional status were recorded. Requirement of AFOs was determined and provided.

**Data Synthesis:** In total 126 DMD children reported to the NMD clinic. Mean age at presentation was 7.6 years (range 2 to 12 years, SD 2.1). Mean duration of illness at first evaluation was 3.4 years (range 0.5 to 10 years, SD 2.0). AFO's were advised at a mean age of 8.5 years (range 7 to 12 years, SD 1.8). Fifty-nine patients were advised AFO as resting or walking splint. At last follow-up 113 patients were still ambulatory whereas 13 had become wheel chair bound. Out of 59 patients, 48 were still wearing AFOs and remaining discontinued them for various reasons.

**Conclusions:** Children with DMD require wearing of AFOs as resting or walking splint, mostly in first or early second decade of life. As there is some gap between onset of clinical signs and requirement of orthosis, follow-up preferably at a multidisciplinary clinic at regular intervals is desirable for timely intervention in the form of AFOs or other splints to prolong ambulatory status in these patients.

**Key Words:** Duchenne muscular dystrophy, Ankle-foot-orthosis, Locomotion

**Disclosures:** Nothing to disclose.