AOPT SIG

ACADEMY OF ORTHOPAEDIC PHYSICAL THERAPY, APTA

FOOT & ANKLE

FASIG

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Foot & Ankle SIG News & Updates

- SIG election time is upon us for a new nominating committee member.

- The student team welcomes Stephen Cabebe! Stephen is from San Jose, California and is finishing up his second year at Regis University. If he's not studying, you can find him either playing his drum set, riding his road bike, running, or watching shows on Disney+.

- The SIG has been moving forward with an info-graphics initiative. This initiative has moved along well with a two-pronged approach. The patient facing information and graphics are being considered for incorporation into the APTA patient information portal at ChoosePT.org. The clinician facing graphics are going to go directly to the AOPT office for review, branding, and dissemination. We plan to get our first set of drafts to them shortly.

- Coming soon! Keep an eye out on the Facebook SIG page for our first Author Spotlight with Dr. Ruth Chimenti from Iowa. We had a great discussion on her recent publication titled: Local Anesthetic Injection resolves movement pain, motor dysfunction, and pain catastrophizing in individuals with chronic Achilles tendinopathy: A Nonrandomized clinical trial.

- We are awaiting final approval of our practice analysis survey from ABPTRFE which should come in early August. Following this approval we will send out the survey! Thanks for all the effort from the task-force and the content expert reviewers that will be completing the survey soon.

- AOFAS annual meeting is going to be virtual on **September 10-12**. There is sure to be lots of great foot and ankle programming. Stay tuned for specific details to register and attend.

FA SIG Updates

Member Spotlight – Steve Reischl, PT, DPT, OCS

Foot & Ankle Trauma and Prosthetic Management

Citation Blast – Physical Therapy Foot & Ankle Considerations for Traumatic Injury

Member Spotlight
Featuring Steve Reischl, PT, DPT, OCS

Where are you originally from?

I was born in Southern California and have lived in the region all my life. I am one of 8 siblings (5th of 8). My parent's instruction of "better to give then to receive" is a mainstay of my siblings and my life forward. My wife Susan, also a physical therapist, is also from in the Southern California area and we settled in Long Beach to have our family.

What type of setting do you work in?

My work settings, like most physical therapists, have varied over my career. I started in a hospital in patient rotation and in 1984 I began our private practice, in outpatient orthopaedic physical therapy that we have had in the Long Beach and Signal Hill area of Southern California.

What sparked your interest in the foot and ankle?

I was passionately working with cardiopulmonary patients in out patient rehabilitation programs. With Cardiac Rehabilitation, the late phase included getting these persons onto fitness programs which in some cases returning to running. I have been a lifelong runner since high school and dealing with the orthopaedic injuries in these persons, I found another passion. As my private practice opened, I developed a relationship with an orthopaedic surgeon, Ronald Smith, MD, and began a motion analysis lab that became the basis of treatment for varied foot and ankle conditions. We remain in close contact after all these years.

What is your current research interest?

My interest has been the rehabilitation of foot and ankle disorders, initially dealing with post-operative tendon disorders of the foot and ankle. This put forward investigation into treatment of tendon disorders and non-operative management. My collaboration with Kornelia Kulig, PT, PhD, has been one of the highlights in my professional life, adding to the treatment of these tendon disorders of the foot and ankle. Our publications and presentations have influenced the care of patients with these conditions.

How did you become involved in research / academics?

In 1994 as the first DPT programs were being developed, the University of Southern California initiated one of the first post professional DPT programs. I obtained my degree and joined the faculty as an adjunct faculty. This association lasted nearly 20 years. I was an instructor in the entry level program from the initial class to 2015. It was at this time, that Kornelia Kulig and I started our collaboration on tendon disorders.

What other activities / hobbies do you enjoy outside of physical therapy?

I have been involved all my life with the activities for persons with intellectual disabilities. My parents developed one of the first Down Syndrome Parent Groups in 1969 and I have been involved in this since in multiple positions. I remain an active participant in outdoor activity, to maintain fitness and health promotion. Hiking and fishing are the main stays of my outdoor activity. Fly fishing has humbled me, but at times, there are successes that still although are dramatic, but does not come close to the satisfaction of assisting our patients and changing their lives through the profession of physical therapy.

- Ethan Duclos, SPT

Foot & Ankle Trauma and Prosthetic Management

A discussion about foot and ankle physical therapy considerations is not complete without addressing the impairments associated with limb loss. Conversation around prosthesis suggestions may tend to circulate around the prosthetist and their recommendations for the patient. However, prosthesis recommendations require a comprehensive understanding of both normal and abnormal foot and ankle anatomy, physiology, and function, making physical therapist input very valuable. Whether related to an acute or chronic diagnosis, patients who have undergone lower extremity amputation would benefit from focused management by the foot and ankle specialist.

Current evidence indicates that approximately 150,000 individuals undergo lower extremity amputation in the United States each year.[1] Of those 150,000 individuals, 82% are related to vascular diagnoses such as diabetes mellitus.[1] Many of these patients will undergo limb salvage amputation at the most distal site to maintain natural anatomy and therefore function.[2,3] Research is limited for functional outcome related to these more distal amputations, likely due to the high frequency of more proximal amputation revisions.[2,3] The remaining 18% of individuals that undergo amputations are related to trauma and complications from the initial injury.[1] While they lack typical ankle and foot anatomy on their amputated limb, correct prosthetic prescription and management can dramatically increase quality of life for these patients.

Individuals with lower limb loss are typically assessed and categorized by K levels. Individuals that score in the K0-K1 range will likely wear basic lower extremity prostheses to allow for visual limb symmetry and completion of basic ADLs or transfers. At the K2 level, individuals are likely going to be able to navigate curbs, stairs, and uneven surfaces. At this functional level and beyond, patients will typically don an energy storing and returning foot. These carbon fiber prosthetic feet have been developed to minimize asymmetries in gait mechanics.[4] Biomechanical analyses have been performed on individuals after unilateral below-knee amputation to compare feet of varying keel and heel stiffness levels.[3] Decreased foot stiffness increases prosthesis range of motion, mid-stance energy storage, and late-stance energy return.[4] However, increased mobility and power potential decreased stability to an extent which requires additional muscle activity to control to maintain patient safety.[4]

Similar findings were highlighted in a 2004 Cochrane review article that compared a flex foot and solid ankle cushioned heel foot.[5] The review noted that use of the flex foot or energy storing and returning foot yielded increased stride length, lowered energy cost, and improved gait efficiency when compared to the less dynamic solid ankle cushioned heel foot.[5] When considering patients with lower extremity amputation, it is best to restore ankle and foot mechanics as close to normal as possible to decrease the risk of overuse or misuse injury in the sound limb.

While previously lower extremity amputations may not have been in the forefront of the foot and ankle specialists' mind, hopefully this brief overview begins to shift that perspective. Physical therapists are uniquely situated to work alongside prosthetists to make recommendations on different components based on the structural and functional limitations the patient experiences.

- Madison Engel, SPT

References:

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2. Finkler ES, Marchwiany DA, Schiff AP, Pinzur MS. Long-term outcomes following Syme's amputation. *Foot Ankle Int*. 2017;38(7):732-735.

3. Thorud JC, Jupiter DC, Lorenzana J, Nguyen TT, Shibuya N. Reoperation and reamputation after transmetatarsal amputation: A systematic review and meta-analysis. *J Foot Ankle Surg*. 2016;55(5):1007-1012. doi:10.1053/j.jfas.2016.05.011

4. Nicholas PF, Klute GK, Neptune RR. The influence of energy storage and return foot stiffness on walking mechanics and muscle activity in below-knee amputees. *Clin Biomech.* 2011;26(10): 2015-1032

5. Hofstad Cj, VanDerLinde H, VanLimbeek J, Postema K. Prescription of prosthetic ankle-foot mechanisms after lower limb amputation. *Cochrance Database of Systematic Reviews*. 2004; 1(003978).

"...prosthesis recommendations require a comprehensive understanding of both normal and abnormal foot and ankle anatomy, physiology, and function, making physical therapist input very valuable."

Citation Blast – Physical Therapy Foot & Ankle Considerations for Traumatic Injury

Traumatic ankle injuries can occur to various structures within the ankle joint. For the clinician, it can be challenging to differentiate and treat traumatic ankle injuries that are not often seen in every day practice. Therefore, this citation blast looks to recognize several uncommon ankle injuries including subtalar dislocations, Lisfranc injuries, calcaneal fractures, and talus fractures. The aim of this citation blast is to aid the clinician in treating and diagnosing some rare traumatic ankle injuries.

1. Prada-Cañizares A, Auñón-Martín I, Vilá y Rico J, et al. Subtalar dislocation: Management and prognosis for an uncommon orthopaedic condition. *Int Orthop*. 2016;40(5):999.

This literature review aimed to identify current intervention strategies for open and closed reduction subtalar dislocations. The authors concluded that individuals with unstable subtalar dislocations who underwent closed reduction were encouraged to remain immobilized for 4-6 weeks with a below knee splint or bivalve cast. The authors concurred that individuals with subtalar dislocations and no presentation of instability could begin early range of motion after a 3-week period of immobilization. Additionally, for stable subtalar dislocations, weight bearing can be gradually incorporated after immobilization.

2. Di Lemme S, Sanderson J, Celebrini RG, Dover GC. A comprehensive nonoperative rehabilitation program including blood flow restriction for a talus fracture in a professional hockey player: A case report. *Int J Athl Ther Train*. 2020;25(3):121-130

This case report reflects a rehabilitation program which included blood flow restriction (BFR) therapy for a professional hockey player with a nondisplaced talus fracture. For the first 2 weeks, the athlete's ankle and foot were immobilized. At the beginning of the second week from injury, the athlete began a BFR protocol of 80% limb occlusion performing four sets of 30, 15, 15 and 15 repetitions of lower extremity exercises. Lower extremity circumferential measurements remained constant from weeks one through five suggesting muscle atrophy had not occurred and BFR had aided in maintaining muscle mass. The athlete was able to return to sport by the seventh week.

3. Podolnick JD, Donovan DS, DeBellis N, Pino A. Is pes cavus alignment associated with Lisfranc injuries of the foot? *Clin Orthop Rel Res*. 2017;475(5):1463-1469.

This retrospective, case-control study aimed to determine if individuals who experienced a low-energy Lisfranc injury had talar head coverage and talo-first metatarsal angles consistent with pes cavus foot type. Weightbearing radiographs of 23 individuals with a Lisfranc injury and 61 control subjects were used to identify angle measurements for pes cavus foot type. The authors found that individuals with Lisfranc injuries had greater talo-first metatarsal angles (1.9 deg +/- 7.9 deg) when compared to controls (-2.2 deg +/- 7.3 deg). Similarly, individuals with Lisfranc injuries had decreased talar coverage (-4.2 deg +/- 9.7 deg) compared to controls (-11 deg +/- 8 deg). The authors concluded that Lisfranc injuries are associated with pes cavus foot type.

4. Aisha Razik, Mark Harris, Alex Trompeter. Calcaneal fractures: Where are we now? *Strategies Trauma Limb Reconstr*. 2017;13(1):1-11.

This literature review aimed to distinguish when nonoperative intervention strategies were appropriate for extra-articular and intra-articular calcaneal fractures. The authors concluded that extra-articular calcaneal fractures with no subtalar involvement could be treated nonoperatively with a non-weight bearing to partial weight bearing progression over a 4-6 week period. When considering intra-articular calcaneal fractures, the Sanders classification system utilizes coronal CT imaging to classify calcaneal fractures as Type I, II, III, or IV. The authors concluded that Sanders Type I and minimally displaced Sanders Type II intra-articular fractures could be managed non-operatively. The authors note that the Sanders classification only bears moderate inter-observer reliability. However, this literature review demonstrates the significance of diagnostic imaging when determining fracture severity.

5. Lasanianos NG, Lyras DN, Mouzopoulos G, Tsutseos N, Garnavos C. Early mobilization after uncomplicated medial subtalar dislocation provides successful functional results. *J Orthop Traumatol*. 2011;12(1):37-43.

A prospective study of 8 individuals with uncomplicated medial subtalar dislocations aimed to determine if a shorter immobilization protocol would improve functional outcomes when compared to previous studies of longer periods of immobilization. The novel protocol included 2-3 weeks of immobilization followed by early range of motion exercises. Functional outcomes, reported in mean scores, were assessed at the conclusion of a 36 month follow up. The percentage of ankle range of motion improvement comparing the uninvolved to involved extremity was 92.5%, and the American Orthopedic Foot and Ankle Society Hindfoot scale score was reported at 90.75 points at 36 month follow up. The authors concluded this shorter immobilization protocol achieved better functional outcomes when compared to previous studies with longer immobilization periods (4-6 weeks). The authors cited a limitation of their study being a small sample size and not including a control group.

6. Griffin Damian, Pasons Nick, Shaw Ewart, et al. Operative versus non-operative treatment for closed, displaced, intra-articular fractures of the calcaneus: randomized controlled trial. *BMJ*. 2014;349:g4483.

This randomized control trial aimed to determine the benefit of open reduction and internal fixation (ORIF) compared to non-operative treatment for individuals with intra-articular calcaneal fractures. One hundred fifty-one patients were randomized into an operative and non-operative group. The primary outcome of pain and function was assessed using Kerr-Atkins scaled 0-100 score. The non-operative group underwent splinting, gentle ankle and subtalar mobilizations, and a progressive weight bearing program. At two-year follow up, Kerr-Atkins scores showed no significant difference between the operative ORIF group (69.8) and the nonoperative group (65.7). The authors noted that of the 151 patients, complications and reoperations were experienced in 23% of the operative group compared to only 4% in the nonoperative group.

- Ethan Duclos, SPT