AOPT SIG
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FOOT & ANKLE
FASIG

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Foot & Ankle SIG News & Updates

Wishing everyone a safe, healthy, and fun holiday season.

Work on the fellowship continues to move forward with the support of a dedicated team for Foot & Ankle SIG members.

Looking forward to seeing you at Combined Sections Meeting in February!

Member Spotlight

Featuring Mary Hastings, PT, DPT, MSCI, ATC

Where are you originally from?

I was born and raised in Carbondale, IL- a college town in Southern Illinois

What type of setting do you work in?

I am a faculty member at Washington University School of Medicine, Program in Physical Therapy. My roles include teaching and research.

What sparked your interest in the foot and ankle?

Something about the analogy of a spark doesn't quite fit my journey. I've never had a clear vision or a pathway I saw and followed. I'm both curious and easily bored. I needed a work environment that was collaborative, encouraging, and supportive and that I enjoyed going to everyday. The foot and ankle experts at Washington University provided an environment that allowed me to ask questions and to challenge myself- trying things and pursue directions I didn't think I had the skills to do. They were the best cheerleaders, prodders and pokers, and offered me opportunities. I say yes to most every opportunity folks offer me and rarely consider where it might lead me. So…here I am…25 years of saying yes to opportunities and I love it! Foot anatomy and biomechanics are complicated and beautiful at the same time. I learn something new about the foot every time I teach, every time I study, even as I look down at my own foot. No chance of becoming bored with that!

What is your current research interest? How Did you become involved in research/academics?

My current curiosities lie in what is required to do something so simple as rising up on your toes? You have a plantarflexor force from the calf, transmitting forces through the calcaneus, but then you need the midfoot to be rigid enough to transmit the force through to the metatarsophalangeal joints but at the same time the intrinsic muscle are assisting in forefoot plantarflexion on the hindfoot, and then there's the complicated triplanar motions across all the joints of the foot that must work together. Isn't that crazy beautiful? In people with diabetes and neuropathy, that system of complex interactions gets messed up from all directions-vascular perfusion and nervous innervation to the muscles are impaired, bone and joint structures are damaged, and the motion doesn't occur. The pathway toward foot deformity and amputation becomes more clearly laid out. Physical therapist have so many opportunities along this destructive pathway toward amputation where we could have changed the course of that individual's life, we could have prescribed a safe and enjoyable exercise program the minute the individual was showing signs of diabetes, we could have strengthening their leg and foot muscles to maximize function, we could have prescribed orthoses and foot to protect their foot. There's a lot for us to work on!

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

I'm a mom of three kids who are leaving home and my onsite/day to day mothering duties are waning. My schedule used to be filled with my kids' lives and work, so I'm in that phase of finding how I want to fill that time. I'm involved with my church-teaching adult Sunday school and caring for church family and community. I also love national parks- camping, hiking, kayaking, and being outdoors. I garden some too but I struggle with being ok with weeds in my flowers-it's not relaxing to me. I love playing pickleball but right now I just play in the street with my 16 year old son. Maybe I'll join a team?

Cam Craver, SPT

Physical Therapy and Diabetes Mellitus

The prevalence of diabetes mellitus has risen in the United States in the last 20 to 30 years, paralleling the trend of rising obesity rates. Diabetes mellitus is now the seventh leading cause of death worldwide.[1] Diabetes presents with a host of its own impairments, but also strongly contributes to the development of systemic cardiovascular disease if left unmanaged. Diabetes mellitus also places a severe economic burden on the United States healthcare system. A study from 2017 reports that the estimated cost of diagnosed diabetes is $327 billion, including $237 billion in direct medical costs and $90 billion related to reduced productivity. Care for diagnosed diabetes accounts for 1 in 4 health care dollars in the United States.[2]

It is well known that type II diabetes mellitus is a condition of chronic elevated blood glucose levels. While there are many musculoskeletal conditions associated with type II diabetes mellitus, peripheral neuropathy of the lower extremities tends to be the most frequent reason for individuals with diabetes to consult a physical therapist. Peripheral neuropathy can lead to a host of lower extremity impairments, such as loss of protective sensation. The development of diabetic foot ulcers is one of the leading causes of amputation in the diabetic population. In addition to integumentary issues, diabetes is associated with Charcot foot deformity, nephropathy, retinopathy, severely impaired standing balance, and overall reduced cardiovascular fitness.

Physical therapists can play a significant role in the prevention and treatment of diabetes mellitus, however, physical therapy is rarely prescribed by primary care providers for the treatment of the condition. PTs can identify potential risk factors for diabetes that are modifiable through exercise and lifestyle changes, such as obesity, hypertension, alcohol use and smoking. Physical therapists can develop a plan of care for a patient diagnosed with diabetes that includes cardiovascular physical activity, education on foot care, balance strategies, and strengthening programs for deterioration of intrinsic foot musculature and overall conditioning.[3]

Physical therapists can play a much larger role in caring for individuals with type II diabetes mellitus. It is imperative that physical therapists continue to advocate for the profession to support members of this disease population through research and the development of interdisciplinary relationships. Members of the APTA Foot and Ankle SIG are leading the way in this area, such as Dr. Mary Hastings's team at Washington University in St. Louis.

Please enjoy the rest of the newsletter focused on diabetic foot, organized by the student team of the APTA Foot and Ankle SIG.

-Lena Parker, SPT, Regis University

References:

1. Glovaci D, Fan W, Wong ND. Epidemiology of Diabetes Mellitus and Cardiovascular Disease. *Curr Cardiol Rep*. 2019;21(4):21. doi:10.1007/s11886-019-1107-y
2. American Diabetes Association. Economic Costs of Diabetes in the U.S. in 2017. *Diabetes Care*. 2018;41(5):917-928. doi:10.2337/dci18-0007
3. Harris-Hayes M, Schootman M, Schootman JC, Hastings MK. The Role of Physical Therapists in Fighting the Type 2 Diabetes Epidemic. *J Orthop Sports Phys Ther*. 2020;50(1):5-16. doi:10.2519/jospt.2020.9154

Citation Blast – The Diabetic Foot

The diabetic foot should be of concern for physical therapists, as up to 80% of patients referred to outpatient PT have diabetes or are at risk for diabetes. The following articles for this quarter's newsletter concern the diabetic foot, with respect to the newest evidence for promoting foot health, treatment for diabetic foot ulcers, and the role of the physical therapist as a frontline provider in diabetic foot management.

1. Askary ZM, Elshazly M. Effect of cryotherapy on infected diabetic foot wounds after surgical debridement. Chirurgia. 2021;34(1). doi:10.23736/s0394-9508.20.05105-0

The purpose of this study was to compare traditional wound care to wound care with cryotherapy and their effects on wound healing and bacterial growth in patients, post-surgical debridement for a diabetic foot ulcer. Results showed statistically significant differences in wound surface area and decrease in positive wound culture of the group receiving cryotherapy and wound care compared to wound care alone.

2. Harris-Hayes M, Schootman M, Schootman JC, Hastings MK. The role of physical therapists in fighting the type 2 diabetes epidemic. Journal of Orthopaedic & Sports Physical Therapy. 2020;50(1):5-16. doi:10.2519/jospt.2020.9154

This clinical commentary highlights the diabetes epidemic and provides recommendations for screening, examination, and preventive care practices that can be implemented by physical therapists. Key takeaway points are that physical therapists are frontline providers in management of diabetes as a chronic condition, and physical activity is an important component to treatment, and should be carefully prescribed and monitored.

3. Lung C-W, Wu F-L, Liao F, Pu F, Fan Y, Jan Y-K. Emerging technologies for the prevention and management of diabetic foot ulcers. Journal of Tissue Viability. 2020;29(2):61-68. doi:10.1016/j.jtv.2020.03.003

This paper discusses emerging technologies to quantify risks of diabetic foot ulcers (laser Doppler flowmetry, infrared thermography, plantar pressure and pressure gradient system, and ultrasound indentation tests) and reviews how physical activity reduces risks of diabetic foot ulcers. Authors suggest at least 150 min of brisk walking per week combined with an individualized exercise plan, rehabilitation interventions, and an integrated approach using emerging technologies will lead to better outcomes of preventing and managing diabetic foot ulcers.

4. Mueller MJ. Mobility Advice to help prevent re□ulceration in diabetes. Diabetes/Metabolism Research and Reviews. 2019;36(S1). doi:10.1002/dmrr.3259

This review provides context for patients' health and mobility status and proposes 5 suggestions to progress mobility following a healed foot ulcer in patients with diabetes. The 5 suggestions are: continue moderate to maximum off-loading for 1-3 months after the wound is healed, wear properly fitting therapeutic shoes, slowly increase steps per day, avoid large variations in steps per day, and provide patient education on self-care with an emphasis on daily visual foot inspection.

5. Orlando G, Reeves ND, Boulton AJM, et al. Sedentary behaviour is an independent predictor of diabetic foot ulcer development: An 8-year prospective study. Diabetes Research and Clinical Practice. 2021;177:108877. doi:10.1016/j.diabres.2021.108877

In this prospective study, authors set out to determine the risk of a sedentary lifestyle in 175 individuals with diabetic peripheral neuropathy. Authors conclude that sedentary time is an independent predictor of the risk of diabetic foot ulcer in people with diabetic peripheral neuropathy, and monitory sedentary time with strategies aimed at reducing it should be included in standard of care of diabetic patients.

6. Wadee AN, Fahmy SM, Bahey El-Deen HA. Low-level laser therapy (photobiomodulation) versus hyperbaric oxygen therapy on healing of chronic diabetic foot ulcers: A controlled randomized trial. Physical Therapy Reviews. 2021;26(1):73-80. doi:10.1080/10833196.2021.1876380

The purpose of this study was to compare the effectiveness of low-level laser therapy (LLLT) and hyperbaric oxygen therapy (HBOT) on the healing of chronic diabetic foot ulcers. Authors conclude that both LLT and HBOT accelerate healing in chronic diabetic foot ulcers, but LLT is more favorable in decreasing ulcer volume after the first 4-weeks.

—Olivia Nicholls, SPT