Foot & Ankle RESEARCH REVIEW™

Making Education Easy

Issue 64 – 2025

In this issue:

Abbreviations used in this issue
ECG = electrocardiogram
NSAID = nonsteroidal anti-inflammatory drug
OR = odds ratio

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Welcome to Issue 64 of Foot and Ankle Research Review.

In this issue, I review a commentary by Lewis et al., that investigates the role of podiatrists in assessing atrial fibrillation, which is well worth a read if you regularly use Doppler to assess lower limb arterial function. Jackson et al., offer a comprehensive analysis of custom foot orthoses prescribing habits of New Zealand podiatrists, providing valuable insights into their prescribing practices.

I hope you enjoy the issue.

Noho ora mai

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Research Review thanks Foot Science International for their sponsorship of this publication and their support for ongoing education for healthcare professionals.

How can podiatrists and other health care professionals support the detection of atrial fibrillation?

Authors: Lewis JEA et al.

Summary: This commentary advocates for podiatrists and other healthcare professionals who frequently treat adults of advancing age, to undertake opportunistic atrial fibrillation (AF) screening in high-risk, asymptomatic individuals and offers guidance for implementation. This would provide early detection with defined referral pathways to allow timely diagnosis and management, potentially reducing AF-related strokes.

Comment: This is a very thought-provoking commentary from the UK, which discusses the role of podiatrists and other healthcare professionals in detecting AF. AF is a global health issue affecting 33.5 million people, with costs projected to reach £75 billion by 2035. Asymptomatic AF, which accounts for 43-48% of cases, increases the risk of stroke and heart failure. The paper advocates for opportunistic AF screening by podiatrists who often treat high-risk, older adults. Podiatrists can integrate AF screening into routine foot examinations using tools like pulse palpation, Doppler, and mobile ECG devices such as AliveCor KardiaMobile. Training podiatrists to recognise abnormal heart rhythms and establishing clear referral pathways for further cardiac evaluation are essential. The study highlights the need for targeted screening, especially in individuals over 65 years of age, to enable early detection and management of AF, potentially reducing AF-related strokes and healthcare costs. The commentary emphasises the importance of follow-up to confirm AF diagnoses and assess changes in medical management, ultimately aiming to improve patient outcomes and reduce the burden on healthcare systems.

Reference: J Foot Ankle Res. 2025;18(1):e70043
Abstract

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Custom foot orthoses: A retrospective analysis of 1000 prescriptions from New Zealand podiatrists

Authors: Jackson A et al.

Summary: This New Zealand study examined characteristics of custom foot orthoses (CFOs), how symmetrically these were applied and whether there was an association with clinical diagnosis. The most common characteristics were a polyamide 11 (PA11) shell (80%), with a thickness of 3 mm (54%), and a modified root shell style (61%), with varus cast correction (64%). The most prescribed modifications were deep heel cups (36%), medial rearfoot skives (36%) and lateral forefoot wedges (22%). A majority (58%) of prescriptions were symmetrical between the left and right sides. The most common diagnosis was plantar heel pain (11%), which was associated with the characteristics of the plantar fascia groove ($p < 0.001$), forefoot lateral wedge ($p < 0.001$) and heel cushion ($p < 0.001$).

Comment: This study, of which I was a co-author, examined the prescription habits of New Zealand podiatrists for CFOs. The most prescribed orthoses used a 'modified root' shell style, 3 mm PA11, and a varus cast correction. The most common addition was lateral forefoot wedges, and full-length top covers were typical. Plantar heel pain was the most common diagnosis associated with orthotic prescriptions, affecting 4-7% of adults. Pes planus and posterior tibial tendon pathology also frequently led to CFO prescriptions. Ankle sprains were linked to valgus cast corrections and lateral forefoot wedges. The study also highlights the frequent prescription of symmetrical CFO, with nearly 60% being identical for both feet. This symmetry might aim to optimise comfort, as asymmetrical designs could be perceived as uncomfortable. Past research has shown that comfort is crucial for adherence to orthotic use.

Reference: J Foot Ankle Res. 2025;18(2):e70044
Abstract

Navigating diagnostic uncertainty in children's chronic lower limb pain: A qualitative study of management strategies using vignette-based focus groups

Authors: Coventry J et al.

Summary: This qualitative study examined management strategies used in children with chronic lower limb pain through eight focus groups including 48 podiatrists discussing three vignettes of a child with chronic lower limb pain, the diagnosis and their approaches to explain and manage pain. Overall, podiatrists were confident in the diagnosis of calcaneal apophysitis and juvenile idiopathic arthritis; however, they were uncertain in a case with generalised lower limb pain. Many groups fixated on the Beighton score (5/9) and interpreted this as hypermobility, which is inconsistent with current clinical guidance. Similar language strategies were used across all three vignettes and were supported by non-verbal communication strategies. Podiatrists discussed treatment strategies including activity modification, passive and self-care strategies and team building.

Comment: The Australian-based study explores how podiatrists manage chronic lower limb pain in children, particularly when faced with diagnostic uncertainty. Chronic lower limb pain is common in children and adolescents, significantly impacting their physical function, school attendance, and quality of life. The study used vignette-based focus groups with 48 podiatrists to discuss their diagnostic certainty and management strategies for three different cases of chronic lower limb pain. The findings revealed that podiatrists were generally confident in diagnosing conditions like calcaneal apophysitis and juvenile idiopathic arthritis, but expressed significant uncertainty when dealing with non-specific chronic pain. Podiatrists employed various language-based and non-verbal communication strategies to manage pain, including educating the child and family, normalising and reassuring, and building rapport. Visual aids were used to support explanations when the diagnosis was clear, while body language was emphasised in uncertain cases. Activity modification was a key treatment strategy across all cases, aiming to maintain physical activity within pain limits. In cases with diagnostic uncertainty, podiatrists also focused on building a multidisciplinary team and providing self-care strategies to empower the child. The study highlights the importance of clear communication, tailored pain education, and a supportive approach in managing chronic pain in children, especially when the diagnosis is uncertain.

Reference: J Foot Ankle Res. 2025;18(1):e70032
Abstract

Psychological factors associated with pain and function in adults with hallux valgus

Authors: Kak A et al.

Summary: This cross-sectional study examined the associations between psychological factors (depression, anxiety and stress [Depression Anxiety Stress Scale-21], pain catastrophising [Pain Catastrophizing Scale], kinesiophobia [Tampa Scale for Kinesiophobia]), and foot function, pain and social interaction (Manchester-Oxford Foot Questionnaire) and hallux valgus-related pain and function in 41 patients scheduled for hallux valgus surgery. Pain catastrophising predicted foot pain and foot function; a one-unit increase in the pain catastrophising score was associated with a 1.41-point increase in foot pain (β 1.41; 95% CI 0.73-2.09; $p < 0.001$) and a 1.83-point worsened foot function (β 1.83; 95% CI 1.12-2.54; $p < 0.001$).

Comment: The study investigates the psychological factors associated with pain and function in adults with hallux valgus. The research aimed to assess the impact of psychological factors such as depression, anxiety, stress, pain catastrophising, and kinesiophobia on foot pain and function in adults scheduled for hallux valgus surgery. The study involved 41 participants who completed questionnaires measuring these psychological factors and their foot pain and function using the Manchester-Oxford Foot Questionnaire. The results indicated that pain catastrophising was a significant predictor of foot pain and function. Other psychological factors, including anxiety and stress, were also significantly associated with worse foot function, more foot pain, and poorer social interactions in univariate analyses. However, in multivariate models, pain catastrophising remained the only significant predictor of all outcomes, suggesting its dominant role in influencing pain and function in hallux valgus patients. The study highlights the importance of assessing psychological factors, particularly pain catastrophising, in the pre-operative environment to better support patients undergoing hallux valgus surgery. The authors recommend incorporating psychological assessments into pre-operative care and providing targeted interventions to address pain catastrophising.

Reference: J Foot Ankle Res. 2025;18(1):e70030
Abstract

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Recommendations for use of extracorporeal shockwave therapy in sports medicine: An international modified Delphi study

Authors: Rhim HC et al.

Summary: This three-stage, modified Delphi questionnaire study assessed 41 international experts' recommendations on the use of extracorporeal shockwave therapy (ESWT) in sports injuries, including terminology, parameters, procedures, contraindications and adverse events. Consensus was reached on 69 of 118 (58.5%) recommendations, including terminology, fundamental concepts, indications, tendinopathy and bone pathology procedures, correlations of treatment with imaging, peri- and post-procedural considerations, contraindications and adverse events. Among statements that did not reach consensus, 17 of 49 (34.7%) were related to bone pathology.

Comment: This study aims to establish an expert consensus on the use of ESWT for musculoskeletal injuries. The study involved a three-stage modified Delphi process with 41 international experts from 13 countries. The key findings include that: (1) ESWT is recommended for various tendinopathies, plantar fasciopathy, bone stress injuries, delayed and non-union fractures, sesamoiditis, and medial tibial stress syndrome; (2) Low to medium energy levels are recommended for tendon conditions, with three to five sessions at 1- to 2-week intervals. For bone conditions, high energy levels and focused ESWT are preferred; (3) NSAIDs should be avoided during treatment, and no range of motion or weight-bearing restrictions are necessary post-treatment for tendinopathies or fasciopathies; (4) Active malignancy near the treatment area is an absolute contraindication. Other relative contraindications include active infections, pregnancy, and the presence of major nerves or pacemakers in the treatment area; (5) Common adverse events include pain at the applicator site, skin erythema, bruising, and haematoma formation. There is a minimal risk of tendon rupture. If you are a regular user of ESWT, then this article is well worth a read.

Reference: Br J Sports Med. 2025;Mar 11 [Epub ahead of print]
Abstract

INDEPENDENT COMMENTARY BY
Professor Matthew Carroll

Matthew is a Professor of Podiatry within the School of Clinical Sciences at Auckland University of Technology (AUT). His research focus is on chronic long-term conditions that affect the lower limb and foot. His postgraduate qualifications include a PhD (AUT), a Master of Educational Leadership (AUT), a Master of Podiatry (Curtin) and a Postgraduate Diploma in Sports Medicine (Otago). In recognition of his contribution to learning and teaching in the podiatry profession he has been awarded two fellowships; a Senior Fellow of the Higher Education Authority and a Fellow of the Faculty of Podiatric Medicine of the Royal College of Physicians and Surgeons of Glasgow. Matthew also contributes the research environment through regular publication of research, supervision of research students, and is a current Associate Editor for the Journal of Foot & Ankle Research.

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The association of sarcopenia and frailty in diabetes-related foot disease: A 3-year prospective evaluation

Authors: Hon KY et al.

Summary: This prospective observational study examined the association of sarcopenia and frailty markers with clinical outcomes in 100 patients (median age 71 years; 75% male; 47% frail) with diabetes-related foot disease. Patients with high handgrip strength (HGS) had 3.83-fold higher odds of wound healing than those with low HGS (OR 3.83; 95% CI 1.35-10.92). Risk of death was higher in patients with low psoas muscle index (HR 2.15; 95% CI 1.17-3.96) and low HGS (HR 0.46; 95% CI 0.22-0.997).

Comment: The study found that participants with higher HGS had approximately four-fold higher odds of wound healing than those with lower HGS. Additionally, each 1 kg increase in HGS was associated with a 4% increase in the chance of faster wound healing. The study also noted that frail participants were generally older and more likely to be female. Unexpectedly, a higher prevalence of stage 4 chronic kidney disease was found in the non-frail group. Sarcopenic patients had a longer duration of diabetes and a lower body mass index. The study reported a 55% survival rate after 3 years, with cardiovascular diseases accounting for half of the deaths. The authors suggest that incorporating HGS assessments could help identify people with diabetes at risk of poor wound healing and mortality, emphasising the need for standardised methods to assess sarcopenia and frailty in people with diabetes-related foot disease.

Reference: J Foot Ankle Res. 2025;18(1):e70038
Abstract

Beliefs about and use of forefoot lateral wedging in podiatric medical practice: A survey of podiatric physicians in New Zealand

Authors: Jackson A et al.

Summary: This cross-sectional, 30-item, anonymous survey of 65 New Zealand podiatrists assessed the rationale and beliefs that guide the use of forefoot lateral wedges (FLWs). Most respondents were trained in New Zealand (90.8%), had >10 years' experience (70.8%), and had a mixed caseload (60.0%); 77.3% of respondents prescribed 0-10 orthoses per week, with 44% using FLWs. The injuries most likely to be treated with FLWs were peroneal tendon injuries and chronic ankle instability. The most common belief (86.2%) was that FLWs increase range of motion of the first metatarsophalangeal joint. FLWs were constructed of 3 mm (73.8%), medium-density ethyl vinyl acetate (92.9%) positioned from the calcaneocuboid joint (54.8%) to the sulcus (78.6%).

Comment: This study, of which I was a co-author, examined beliefs about and use of forefoot lateral wedging. Lateral wedging can be defined as material sloped uniformly to be thicker on the lateral side than on the medial side. These wedges are commonly added to foot orthoses or shoe insoles in the management of several lower-limb pathologies. This study investigates the frequency and application of FLWs among New Zealand podiatrists. The findings highlight that FLWs are included in nearly half of all orthotic prescriptions, making them the second most widely used orthosis modification. Peroneal tendinopathy and chronic ankle instability were the most common conditions treated with FLWs, which are believed to shift the centre of pressure (COP) medially. However, current research suggests that lateral wedges shift the COP laterally. The tissue stress theory was the most influential paradigm guiding orthosis modification, aiming to reduce stress on tissues. There was a notable inconsistency between the theories of foot function valued by clinicians and the biomechanical outcomes they believed were achieved. For example, many respondents used FLWs to balance the foot and increase the first metatarsophalangeal joint range of motion, despite limited evidence supporting these effects. The study also found that FLWs were typically made from 3 mm, medium-density ethyl vinyl acetate and positioned from the calcaneocuboid joint to the sulcus. The survey revealed inconsistencies in the terminology used to describe FLW thickness and inclination, highlighting the need for standardised terminology and further research to understand the biomechanical effects of FLWs.

Reference: J Am Podiatr Med Assoc. 2025;115(1):22-022
Abstract

New classification system for proximal fifth metatarsal fractures: Intraobserver and interobserver reliability assessment

Authors: Fernández-Rojas E et al.

Summary: This study assessed the intra- and inter-observer agreement of a new classification system for proximal fifth metatarsal fractures that categorised the fractures into two main types and two subtypes, the assessment was based on 52 retrospective cases evaluated by three independent foot and ankle surgeons. Inter-observer agreement was strong when assessing the two main types (Cohen's kappa coefficient [κ] = 0.73) and remained so across subtypes (κ = 0.67). Intra-observer agreement after a 10-month gap between classifications for the two main types had a κ of 0.79; when including subtypes the κ was 0.77.

Comment: Fractures of the fifth metatarsal are the most common metatarsal fractures, accounting for 68% of cases. This study introduces a classification system for fractures of the base of the fifth metatarsal, aiming to provide a clear and reproducible method with significant inter-observer and intra-observer agreement. The system categorises fractures into types and subtypes based on anatomical considerations and mechanisms of injury, facilitating comparison across studies. The new system includes three main types of fractures, with type I further subdivided based on involvement of the cuboid articular surface. Type II fractures encompass zones II and III of the existing Lawrence and Botte system, allowing for the use of the term "Jones fracture". The study identifies the lateral band of the plantar fascia, and the peroneus brevis tendon as key structures involved in avulsion fractures, with the latter contributing to greater instability and risk of displacement. This is a good article to refresh your knowledge surrounding fifth metatarsal fractures.

Reference: Foot Ankle Int. 2025;46(2):246-254
Abstract

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Muscle strengthening exercises for the foot and ankle: A scoping review exploring adherence to best practice for optimizing musculoskeletal health

Authors: Osborne JWA et al.

Summary: This scoping review sought to describe foot and ankle strengthening exercises recommended in 87 publications, compare the prescription to best practice recommendations from the American College of Sports Medicine's (ACSM) guidelines, and assess completeness of reporting of these exercises and exercise programmes using the Consensus on Exercise Reporting Template (CERT). Overall, 300 foot and ankle exercises were recommended; the most common involved ankle plantar flexion (25%) or plantar foot intrinsics (16%). The most common prescription included 3 sets (37%) of 10 repetitions (38%), 3 times per week (34%), mostly without a prescribed load (66%). In 93% of studies, the prescribed sets per muscle group met ACSM recommendations for novice lifters. Load intensity (for increasing muscle strength) was prescribed at the recommended level of 60% of the ≥1 repetition maximum in only 2% of exercises. Median completeness of reporting score was 31%.

Comment: This review examines foot and ankle muscle strengthening exercises, focusing on their prescription and reporting quality. The review aimed to describe recommended exercises, compare them to the ACSM guidelines, and assess reporting completeness using the CERT. The main findings of the review included: (1) Ankle plantar flexion exercises were the most common (25%), followed by plantar intrinsic exercises (16%). Dexterity exercises, such as ankle alphabet and toe yoga, accounted for 15%; (2) Resistance bands were frequently used, particularly red medium-strength Thera-Bands. However, many exercises lacked specified resistance, leading to inadequate load intensity for optimal strength gains; (3) Exercises were commonly prescribed as three sets of 10 repetitions, three times per week. This generic approach may not consider individual needs for optimal strength gains; (4) The median CERT score was 31%, indicating poor reporting quality. Key details such as load intensity and progression were often missing. The review highlights significant gaps in the prescription and reporting of foot and ankle strengthening exercises.

Reference: J Foot Ankle Res. 2025;18(2):e70040
Abstract

Footwear toe-box shape and medial forefoot pressures in women with hallux valgus

Authors: Bajraszewski KJ et al.

Summary: This study assessed whether the toe box of footwear usually worn by 28 women (mean age 60.7 years) with hallux valgus was associated with pressure on the medial forefoot. Peak pressure was greater (mean difference [MD] 33.0 kPa; $p < 0.001$) and maximum force was higher (12.8 N; $p = 0.001$) and occurred later in the stance phase at the distal forefoot versus the proximal forefoot (MD = 6.0%; $p = 0.083$ and 6.9%; $p = 0.045$). There were no correlations between toe-box differential and medial forefoot pressures.

Comment: This study investigated the relationship between footwear toe-box shape and medial forefoot pressures in women with hallux valgus. Data indicated no correlations between toe-box differential (difference in width and area between the foot and footwear) and medial forefoot pressures. The results suggest that the shape and fit of the footwear's toe-box do not influence medial forefoot pressures in women with hallux valgus. This indicates that changing the toe-box width and area of footwear may not necessarily reduce medial forefoot pressures in this population. The study highlights the importance of considering other factors, such as the material and flexibility of the shoe upper, in managing hallux valgus. The authors suggest that footwear advice should be part of a multimodal approach, including orthotic devices and muscle strengthening exercises, rather than relying solely on changing toe-box dimensions.

Reference: J Foot Ankle Res. 2025;18(2):e70041
Abstract

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