Foot & Ankle RESEARCH REVIEW™

Making Education Easy

Issue 68 – 2026

In this issue:

Abbreviations used in this issue
BMI = body mass index
FFI = Foot Function Index
MPJ = metatarsophalangeal joint

Welcome to Issue 68 of Foot and Ankle Research Review.

This issue brings together recent evidence spanning musculoskeletal pathology, diabetes-related foot disease, orthotic intervention, rehabilitation and postoperative care. Across conditions, a consistent theme emerges; foot function, disability and outcomes are more strongly influenced by graded structural change, mechanical loading and patient behaviour than by isolated inflammatory or biomechanical markers alone. Collectively, papers in this issue reinforce the need for precise clinical assessment, appropriate outcome selection and person-centred management, while cautioning against reliance on oversimplified measures or short-term outcomes when managing complex foot and ankle presentations.

I hope you enjoy the issue.

Noho ora mai

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Postoperative dressing regimens in nail surgeries: A scoping review

Authors: Wassef DYFI et al.

Summary: This scoping review assessed postoperative dressing regimens after toenail surgery based on 14 studies including 27 dressing regimens and 15 outcome measures. Overall, none of the outcome measures had high quality evidence supporting use and the variability in outcome measures and lack of high-quality studies meant no specific conclusions could be determined. However, there was a consensus that primary dressings were more likely to impact postoperative outcomes than secondary dressings.

Comment: This scoping review demonstrates that the current evidence base is insufficient to support any specific postoperative dressing regimen following toenail surgery. Across 14 studies, 27 dressing regimens and 15 outcome measures were identified, but none used validated outcome instruments and most relied on heterogeneous, author-defined measures. Methodological quality was generally poor, with high or medium risk of bias in most studies, inconsistent comparators, and no standardised control conditions. Evidence for key outcomes, including infection, healing time, exudate and pain, was sparse, inconsistently defined and frequently underpowered. Infection outcomes were rarely and poorly measured, healing definitions varied widely and were confounded by differences in surgical technique, and reported benefits for exudate or pain were largely transient or at high risk of bias. Clinically, the choice of postoperative dressing after toenail surgery should be guided by clinical judgement and practicality rather than by evidence of superiority, and there is a pressing need for well-designed trials with standardised outcomes to inform practice.

Reference: J Foot Ankle Res. 2026;19(1):e70100

Abstract

The immediate effect of lateral wedging on first metatarsophalangeal joint kinematics and centre of pressure

Authors: Jackson A et al.

Summary: This study used a randomised crossover design to explore the effect of lateral wedge design and placement on first metatarsophalangeal joint (MPJ) extension and centre of pressure (COP) during walking and running gait in 24 healthy participants. A total of 10 insole conditions comprising differing combinations of inclination, placement and contour were assessed. During both walking and running, lateral wedges were found to significantly reduce first MPJ extension ($p < 0.001$, 100% of stance; $p = 0.004$, 14-72% and $p = 0.017$, 76-99% of stance). Lateral wedge placement also reduced first MPJ joint extension during walking ($p < 0.001$; 100% of stance) and running ($p = 0.003$; 13-69%, and $p = 0.012$; 78-100%). COP was shifted medially relative to the midline of the foot by full-length or 6° lateral wedges ($p = 0.01$). A smaller reduction in first MPJ range of motion during walking ($p = 0.008$) was seen with lateral wedges placed on contoured insoles compared with sham insoles and they shifted the COP medially during both walking ($p < 0.001$) and running ($p = 0.020$).

Comment: This study, in which I was a co-author, investigated how lateral wedge inclination, length and placement influence first MPJ extension and COP during walking and running in healthy individuals. The primary finding was that lateral wedges consistently reduced first MPJ extension in both gait modes, regardless of wedge inclination or placement, with greater reductions during running than during walking. This reduction was accompanied by a medial shift in COP, particularly with 6° and full-length wedges, suggesting altered plantar loading under the first metatarsal head. These findings contrast with some previous literature and may be explained by differences in wedge material, shoe design and insole contour. Increasing wedge inclination beyond 3° produced little additional biomechanical effect, aside from a small further reduction in first MPJ extension during walking and may not be justified given comfort considerations. Forefoot wedges produced smaller and shorter-lasting effects than full-length wedges, while contoured insoles modified both COP behaviour and first MPJ motion compared with sham insoles. Effects also differed between walking and running, occurring earlier and over a longer portion of the stance phase in running. From a clinical perspective, the lateral wedge design meaningfully influences forefoot biomechanics; careful selection of wedge length, inclination and insole contour is important.

Reference: Gait Posture 2026;127:110152
Abstract

Effects of first metatarsophalangeal osteoarthritis on plantar pressures across multiple activities

Authors: Telfer S et al.

Summary: This case-control study examined whether activities that may stress the first MPJ to a greater extent than standard gait may reveal greater differences in plantar pressures between those with first MPJ osteoarthritis and those with healthy feet. A total of 22 participants with first MPJ osteoarthritis and 21 matched controls performed four activities while plantar pressures were measured: standing, walking, stair ascent, and heel raise. There were no differences in discrete variables across the activities when measured using traditional measures; however, statistical parametric mapping revealed differences for the group with first MPJ osteoarthritis, including reduced loading under the distal first metatarsal head (60%-80% of stance), increased midfoot pressures at 70%-80% of stair ascent, and decreased lateral forefoot pressure during heel raise.

Comment: This study examined differences in plantar foot pressures between patients with first MPJ osteoarthritis and healthy controls during various activities, including stair climbing and heel raises. Contrary to the authors' hypothesis, tasks such as stair ascent and heel raise did not produce widespread or clinically obvious differences when assessed using traditional discrete plantar pressure measures. However, more sensitive statistical parametric mapping revealed subtle, phase specific differences, including reduced loading beneath the distal first metatarsal head during late stance in walking, increased midfoot loading during stair ascent, and reduced lateral forefoot loading during heel raise. These findings are interpreted as evidence of compensatory off-loading strategies, likely driven by pain, joint stiffness, or reduced dorsiflexion at the first MPJ. The authors note that similar minimal differences have been reported in prior studies of level walking, underscoring the challenges of detecting biomechanical changes using peak pressure or pressure–time integral alone. Importantly, no differences in foot posture or arch profile were identified, supporting existing evidence that first MPJ osteoarthritis primarily affects local joint mechanics rather than global foot structure. Clinically, the authors suggest that while group-level effects are small, the identified regions of altered loading may still inform personalised orthotic interventions.

Reference: J Foot Ankle Res. 2026;19(1):e70146
Abstract

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Prevalence and incidence of diabetes-related peripheral neuropathy, peripheral artery disease, foot ulcers and lower extremity amputations in Ireland; A systematic review

Authors: Kavanagh S et al.

Summary: These authors systematically searched Pubmed, EMBASE and Lenus, the Irish Health Research repository, for peer-reviewed articles published until August 2025 reporting on the prevalence and incidence of peripheral neuropathy, peripheral artery disease, foot ulceration or amputation in people with diabetes in Ireland. A total of three studies met the inclusion criteria (n = 145,945). Peripheral neuropathy prevalence ranged from 15% to 39% (n = 1055) and peripheral artery disease prevalence ranged from 18% to 34% (n = 383) in community-based diabetes populations. The prevalence and annual incidence of a history of foot ulcers were 3.7% (n = 563) and 2.6% (n = 383), respectively. In one national population-based study (n = 144,710) amputation increased from 144.2 to 175.7 per 100,000 people with diabetes between 2005 and 2009.

Comment: This systematic review identified only three eligible studies reporting the incidence or prevalence of peripheral neuropathy, peripheral artery disease, diabetes-related foot ulcers or lower extremity amputations in people with diabetes in the Republic of Ireland, highlighting a marked scarcity of population-based research in this area. Reported prevalence of peripheral neuropathy ranged from 15% to 39% in community-dwelling populations, with wide variation attributable to differences in assessment methods and reliance on self-report, which may underestimate true prevalence given the high proportion of asymptomatic cases. The prevalence of peripheral arterial disease similarly varied (18%-34%) depending on diagnostic criteria, predating international consensus on standardised assessment. Evidence regarding diabetes-related foot ulcers was particularly limited, with only one study reporting an annual incidence of 2.6% and none reporting an active prevalence. Amputation data suggested increasing rates in Ireland during the mid-2000s, contrasting with international trends of declining lower extremity amputations, particularly major amputations. Overall, the review highlights critical gaps in surveillance of diabetes-related foot disease in Ireland and demonstrates the urgent need for nationally representative, longitudinal studies using standardised definitions and validated outcome measures, ideally supported by a national diabetes register or routinely collected health data.

Reference: J Foot Ankle Res. 2026;19(1):e70147
Abstract

Reporting and utilization of patient-reported outcomes measures in the evaluation of foot orthoses treatment: A systematic review

Authors: Jiménez-Guillén J et al.

Summary: This systematic review sought to determine the quality of validated foot and ankle patient-reported outcome measures (PROMs) used to evaluate foot orthosis interventions. Literature searches of PubMed, Embase, Scopus, Web of Science, and the Cochrane Library identified 205 articles that met the inclusion criteria assessed using the COSMIN checklist. Among these articles, 11 validated PROMs with good psychometric properties according to COSMIN criteria for the evaluation of foot orthoses were identified. The most commonly used PROMs were the Foot Function Index (FFI) and the Foot Health Status Questionnaire (FHSQ), while psychometric evaluation using updated COSMIN criteria suggested the best measurement properties were from the Victorian Institute of Sport Assessment-Achilles tendon (VISA-A) questionnaire. The Foot and Ankle Outcome Score (FAOS), and the Revised Foot Function Index (FFI-R) were also identified as useful PROMs for evaluating foot orthoses treatments.

Comment: This review examined the psychometric quality of validated foot- and ankle-specific PROMs used to evaluate foot orthosis interventions and found that most demonstrate acceptable measurement properties. The FFI and FHSQ were the most frequently used and widely validated PROMs. While the VISA-A showed the strongest overall psychometric performance, with positive evidence across seven measurement properties, its condition-specific focus on Achilles tendinopathy limits its suitability for general foot orthosis evaluation. In contrast, the FAOS and the FFI-R demonstrated strong psychometric performance across multiple properties while retaining broad clinical applicability, making them the most appropriate instruments overall. Clinically, the review highlights that PROM selection for foot orthosis evaluation should be evidence based, as commonly used instruments vary in robustness. The findings support the FAOS and FFI-R as the most suitable measures, offering strong psychometric quality alongside broad clinical applicability for assessing patients' perceived outcomes of foot orthosis interventions.

Reference: J Foot Ankle Res. 2026;19(1):e70148
Abstract

Efficacy and safety of dextrose prolotherapy versus corticosteroid injections in plantar fasciitis: A systematic review and meta-analysis

Authors: Qafesha RM et al.

Summary: This systematic review and meta-analysis compared corticosteroid injections and dextrose prolotherapy for the treatment of plantar fasciitis based on five randomised controlled trials and two cohort studies including 567 patients. Over the short-term (1 month), corticosteroid injections were more effective for reducing overall Visual Analogue Scale (VAS) pain scores than dextrose prolotherapy (mean difference [MD] 1.85; 95% CI 0.05-3.64; p = 0.04), VAS at first step in the morning (MD 1.26; 95% CI 0.49-2.02; p = 0.001), and VAS while walking (MD 1.85; 95% CI 0.68-3.02; p = 0.002). There was also a greater reduction in Foot Function Index (FFI) score (MD 18.81; 95% CI 0.06-37.55) and plantar fascia thickness (PFT; MD 0.26 mm; 95% CI 0.07-0.45) with corticosteroid injection versus dextrose prolotherapy. Over a longer period (3 months), there was a greater decrease in FFI score (p = 0.003) with dextrose prolotherapy versus corticosteroid injection, with no difference in VAS or PFT.

Comment: Plantar fasciitis is a common and often persistent cause of heel pain that can lead to prolonged disability and significant healthcare use. While many patients respond to conservative management, injection therapies are frequently used for refractory symptoms. Corticosteroid injections remain popular for rapid pain relief, whereas dextrose prolotherapy has gained attention as a regenerative option aimed at longer-term tissue healing. This systematic review and meta-analysis provide a comprehensive head-to-head comparison of corticosteroid injection and dextrose prolotherapy in plantar fasciitis to date, incorporating seven studies and separating pain domains, functional outcomes and PFT. The findings show a clear temporal distinction between treatments. Corticosteroid injection was superior for short-term outcomes, producing greater reductions in pain across all VAS domains, FFI, and greater early reductions in PFT. However, these benefits diminished over time. At 3 months, dextrose prolotherapy demonstrated superior functional improvement, with no significant differences in pain or PFT, suggesting more sustained recovery. Subgroup analyses highlighted the importance of ultrasound guidance, which enhanced dextrose prolotherapy effectiveness, while corticosteroid injection remained effective with palpation guidance. Overall, corticosteroid injection offers rapid symptom control, whereas dextrose prolotherapy appears better suited to longer-term functional restoration. Clinically, corticosteroid injections may be preferred for immediate pain relief, while ultrasound-guided dextrose prolotherapy may be the better option when durable functional recovery and reduced risk of steroid-related adverse effects are priorities.

Reference: J Foot Ankle Res. 2026;19(1):e70135
Abstract

Clinical and structural associations of disability and gait performance in patients with rheumatoid arthritis in remission and metatarsal pain

Authors: Bueno Fermoso R et al.

Summary: This cross-sectional study sought to identify clinical and structural associations of disability and gait performance in 81 patients with rheumatoid arthritis in clinical remission with metatarsal pain. In these patients, mean FFI disability subscale (FFI-D) score was 29.8 and FFI activity limitation subscale (FFI-AL) score was 29.1, gait velocity was 0.90 $m.s^{-1}$, and double-support time was 22.9%. Using bivariate and age and BMI-adjusted analyses, with disability and gait outcomes were associated with graded structural measures more consistently than dichotomous/count variables. FFI-D and FFI-AL were associated with pain intensity and first metatarsophalangeal joint stiffness or limited dorsiflexion, while gait performance was associated with age/BMI, greater forefoot structural severity and first MPJ stiffness. Higher grey-scale synovitis/lower structural-burden and lower grey-scale synovitis/higher structural-burden groups were identified by cluster analysis, with worse function and slower gait in the lower grey-scale synovitis/higher structural-burden group.

Comment: The study found that disability and activity limitation, as well as gait velocity and double-support time, were more strongly associated with graded structural damage and deformity than with ultrasound-based inflammatory markers. Pain intensity primarily influenced self-reported disability and had a weaker effect on objective gait parameters. Forefoot damage and deformity were consistently related to worse outcomes, with graded metrics outperforming simple counts or composite indices in discriminating functional impact. First MPJ deformity emerged as a particularly robust predictor of disability and gait impairment. Cluster analysis identified two MPJ phenotypes, an inflammatory phenotype with higher synovitis but lower deformity, and a structural/mechanical phenotype characterised by greater deformity, worse function and slower gait, likely reflecting cumulative disease burden rather than active inflammation. Although forefoot pathology was central, hindfoot involvement also contributed independently to disability. Overall, the findings emphasise that precise grading of structural damage is critical for understanding function in people with rheumatoid arthritis. Clinically, detailed forefoot assessment, particularly graded structural evaluation, provides more meaningful insight into disability and gait impairment than inflammation measures alone, even in rheumatoid arthritis remission.

Reference: J Foot Ankle Res. 2026;19(1):e70133
Abstract

INDEPENDENT COMMENTARY BY

Professor Matthew Carroll

Matthew Carroll is Head of School – Allied Health and Professor of Podiatry at Auckland University of Technology. His research focuses on chronic lower-limb and foot conditions, with an emphasis on improving clinical outcomes and quality of life. Matthew has published extensively in peer-reviewed journals and presented at national and international conferences. He has held associate editorial positions with the Journal of Foot & Ankle Research, PLoS ONE, and BMC Musculoskeletal Disorders. He is recognised as an experienced academic leader, having held several senior leadership roles. In acknowledgement of his contributions to learning and teaching, Matthew is a Senior Fellow of the Higher Education Academy and a Fellow of the Faculty of Podiatric Medicine at the Royal College of Physicians and Surgeons of Glasgow.

Structure and function of the Achilles tendon and plantarflexors 1 year following Achilles tendon rupture in the United Kingdom: A cross-sectional study

Authors: Briggs-Price S et al.

Summary: This cross-sectional study assessed Achilles tendon structure, strength and function in 60 participants (mean age 55.2 years; 78.5% male) ≥1 year after Achilles tendon rupture. At a mean of 6.8 years after rupture, the tendon had a 62% larger cross-sectional area (CSA), with 28.7 mm^2 (16%) disorganised fibrillar structure (DFS), versus 7.3 mm^2 (7%) in the unaffected tendon ($p < 0.001$). Aligned fibrillar structure (AFS) decreased with time after injury ($p = 0.04$). There were no associations with time for CSA or DFS. Deficits in plantarflexor strength and function were observed with maximal voluntary isometric contraction (MVIC) lowered by 18% and calf raise work lowered by 40% ($p < 0.001$). Achilles tendon resting angle indicated tendon elongation by 6.7° ($p < 0.001$). Median Achilles tendon rupture score was 83, EuroQol 5-dimensional health-related quality of life score was 0.95 and the VAS score was 85; 93% of participants were physically active based on the General Practice Physical Activity Questionnaire.

Comment: This study provides novel evidence that significant structural and functional deficits persist long after Achilles tendon rupture. More than 1 year post-injury, the affected tendon showed a larger cross-sectional area, greater tendon elongation and a higher proportion of disorganised tendon structure compared with the non-affected limb, suggesting incomplete remodelling. Although there was a reduction in the aligned fibrillar structure over time, the changes were modest and may reflect limited adaptive remodelling, an incomplete rehabilitation stimulus, or insufficient statistical power. Marked and persistent deficits in plantarflexor strength and endurance were identified, particularly during repeated isotonic tasks, consistent with tendon elongation and altered neuromuscular function. Patient-reported outcomes indicated moderate functional recovery, yet many participants reported fear of reinjury and reduced return to sport despite high satisfaction and activity levels, highlighting a disconnect between objective impairments and perceived recovery. Clinically, the long-term deficits in tendon structure and plantarflexor function persist after Achilles tendon rupture, underscoring the need for prolonged, targeted rehabilitation addressing strength, endurance and tendon adaptation beyond the first-year post injury.

Reference: J Foot Ankle Res. 2026;19(1):e70134
Abstract

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Exploring experiences and perspectives of prescribed foot orthoses in people with diabetes

Authors: Sedighi N et al.

Summary: This qualitative study used a combination of online focus groups and individual interviews to examine the experiences and perceptions of eight people at risk of diabetes-related foot ulcers on prescribed foot orthoses. Thematic analysis identified three major themes: adherence and barriers to effective use of foot orthoses, including the role of health professionals and relationships between footwear and foot orthoses; perceived benefits of foot orthoses and improvements desired by participants; and anxiety, fear and psychological influences on footcare behaviours.

Comment: This qualitative study highlights that adherence to prescribed foot orthoses and footwear in people with diabetes is complex and strongly influenced by individual experiences, preferences and psychological factors. Despite advances in foot orthosis design, satisfaction and adherence were mixed, with some participants abandoning devices altogether, often due to discomfort, incompatibility with everyday footwear, or perceptions of instability and fall risk. Foot orthoses and footwear were viewed as interconnected interventions, meaning dissatisfaction with one frequently led to rejection of both. Adherence was further complicated by diabetic neuropathy, where the absence of pain reduced perceived need for use. Psychological factors, including fear and anxiety about future foot complications, acted as both motivators and barriers. The quality of healthcare support also played a critical role; participants who felt well-informed and supported were more confident and engaged, whereas poor follow-up and limited education undermined adherence. The findings emphasise that foot orthosis effectiveness is not determined solely by biomechanical performance, but by how well devices align with users' lived experiences, daily activities, and expectations, reinforcing the need for personalised, supportive, and person-centred foot care.

Reference: J Foot Ankle Res. 2026;19(1):e70130
Abstract

Prevalence, severity and impact of foot pain in 419 pregnant participants: The Queensland Family Cohort study

Authors: Fontes JR et al.

Summary: This Australian prospective longitudinal study assessed self-reported prevalence, severity, frequency and impact of foot pain during pregnancy and the impact on work, activities and quality of life in 419 pregnant women (mean age 32.2 years; mean BMI 27) from the Queensland Family Cohort study based on questionnaires at 12-24 weeks, 24 weeks, 36 weeks and 6 weeks postpartum. Prevalence of foot pain during pregnancy was 44% at up to 24 weeks, 56% up to 36 weeks and 54% up to the end of pregnancy. Pain severity was mild to moderate and frequency was occasional. The impact on work, activities and quality of life was mild to moderate and participants with foot pain had a lower perceived level of health.

Comment: This prospective longitudinal study found that foot pain is highly prevalent during pregnancy, affecting 44-56% of participants, a rate comparable to low back and pelvic girdle pain. While most women reported mild symptoms with minimal impact on work or daily activities, a substantial minority experienced moderate to severe pain that affected function and perceived health. Foot pain was already problematic in early pregnancy, persisted through mid-pregnancy, and remained evident 6 weeks postpartum, with affected participants reporting lower overall health status. The prevalence is likely related to pregnancy-related biomechanical and physiological changes, including weight gain, increased plantar pressure, foot pronation and alterations in foot structure. Although mobility and self-care were largely preserved, pain and discomfort consistently reduced quality of life. Differences between this and previous studies may reflect variation in outcome measures, timing of assessment and contextual factors such as pandemic-related lifestyle changes. From a clinical perspective, routine assessment of foot health during antenatal and postnatal care may enable early identification and management of foot pain, helping to preserve maternal function and quality of life.

Reference: J Foot Ankle Res. 2026;19(1):e70132
Abstract