

Foot & Ankle RESEARCH REVIEW™

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Issue 66 – 2025

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Abbreviations used in this issue

BMI = body mass index
MRI = magnetic resonance imaging
NS = not significant
NSAID = nonsteroidal anti-inflammatory drug

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Welcome to Issue 66 of Foot and Ankle Research Review.

This issue highlights a variety of exciting research, from the comparable effectiveness of sodium hydroxide and phenol in chemical matrixectomy, as well as the superior outcomes of combined corticosteroid and radiofrequency therapy for plantar fasciitis. A survey on patient lateness reveals its disruptive impact on podiatry services, while a systematic review challenges assumptions about MRI findings in Baxter's neuropathy.

I hope you enjoy the issue.

Noho ora mai

Professor Matthew Carroll

matthewcarroll@researchreview.co.nz

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

Sodium hydroxide versus phenol chemical matrixectomy: A comparative retrospective medical record review

Authors: Brackney CK et al.

Summary: This retrospective study assessed recurrence and reoperation rates in 192 patients after chemical matrixectomy (CM) for ingrown toenails with sodium hydroxide (NaOH) or phenol. In patients receiving phenol partial nail avulsions, there were 46 nail border removals, while among NaOH partial nail avulsions, there were 258 nail border treatments. Over a mean follow-up of 93 days (median 17 days), the mean reoperation rate per border among partial nail avulsions with phenol was 6.5%; the reoperation rate with NaOH was 7.8% (NS). The mean recurrence of painful nail edge rate per border with phenol was 10.9%, while with NaOH the rate was 8.1% (NS).

Comment: This US-based study reveals that CM using either NaOH or phenol is a reliable procedure for treating ingrown toenails, with similar rates of recurrence and reoperation. In this retrospective review, the recurrence rate for painful nail borders was 10.9% for phenol and 8.1% for NaOH, while reoperation rates were 6.5% and 7.8% respectively, differences that were not statistically significant. Pain scores and antibiotic prescription rates were also similar between groups. These findings are consistent with previous studies and meta-analyses, which have found no clear superiority of one chemical agent over the other. Clinically, this evidence supports the use of either NaOH or phenol for CM, allowing practitioners to select the agent based on availability, institutional protocols, or patient-specific factors. Similar efficacy and safety profiles mean that both agents can be confidently used to achieve permanent resolution of ingrown toenails. The study also highlights the importance of standardised postoperative care and follow-up to monitor for recurrence and complications.

Reference: *J Am Podiatr Med Assoc.* 2025;115(4):23-081

[Abstract](#)

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Comparative effectiveness of ultrasound-guided corticosteroid injection, radiofrequency ablation, and their combination for recalcitrant plantar fasciitis: A retrospective cohort study

Authors: Aktan Ç & Aktan C

Summary: This retrospective study compared corticosteroid injection (CI) versus radiofrequency ablation (RFA) or a combination of both in 156 patients with ultrasonographically confirmed plantar fasciitis that was unresponsive to ≥ 3 months of standard conservative therapy. At 6 months, pain intensity (visual analogue scale) declined from 6.73 to 6.81 at baseline to 1.62 with RFA and 1.83 with combination treatment, but remained at 6.56 with CI. Foot Function Index [FFI] decreased from approximately 52 to 21.50 with RFA and 17.57 with combined therapy, but remained at 46.62 with CI. Plantar fascia thickness declined from approximately 6.2 mm to 3.29 mm with RFA, 2.71 mm with combination therapy, and 2.95 mm with CI. Relapses occurred in 23.1%, 38.0%, and 14.8% of RFA, CI, and combined therapy recipients, respectively.

Comment: This retrospective cohort study offers a valuable comparison of CI, RFA, and their combination for chronic plantar fasciitis unresponsive to conservative management. The findings indicate that while CI and RFA both provide improvements in pain, function, and plantar fascia thickness, the combined approach yields the most pronounced and durable benefits, with the lowest recurrence rate at 12 months. For clinical practice, these results support the recommendation that ultrasound-guided combined CI and RFA should be considered as a first-line intervention for patients with recalcitrant plantar fasciitis, given its superior efficacy and safety profile. The use of ultrasound guidance is recommended to enhance procedural accuracy and minimise complications. Regular monitoring using validated pain and function indices, alongside ultrasonographic assessment, is advised to track treatment response and detect early relapse. Clinicians should be mindful of the study's retrospective design and single-centre setting, which may limit generalisability. Overall, the evidence supports a shift towards integrated, image-guided therapies for chronic plantar fasciitis, prioritising combined CI and RFA for those unresponsive to conservative care.

Reference: *J Foot Ankle Res.* 2025;18(3):e70080

[Abstract](#)

Investigating the impact of patient lateness on the podiatry profession: An international survey

Authors: Nasendran T et al.

Summary: This multinational, cross-sectional online survey of 201 podiatrists assessed the impact of patient lateness on podiatry practices and current strategies to manage patient lateness. Over 90% of podiatrists had experienced clinic workflow disruptions due to late patients, with common reasons including traffic issues and parking difficulties. SMS reminders appeared to be the most effective tool for reducing tardiness. A 10-minute grace period was used by 59.3% of podiatrists before rescheduling late appointments, which reduced lateness by 50%. Some podiatrists avoided rescheduling to prevent worsening of patients' conditions or to avoid dealing with complaints. Many podiatrists reported a lack of management support for dealing with late patients.

Comment: This international survey highlights that patient lateness is a significant and widespread issue in podiatry, with 20% of patients arriving late weekly and over 90% of podiatrists reporting disruptions to clinic workflow. This study identifies transportation and parking difficulties as the most common causes, alongside habitual lateness. While appointment reminders, especially SMS are effective, and a 10-minute grace period before rescheduling can halve late arrivals, the study reveals that enforcement of lateness policies often falls to clinicians rather than managers, creating tension and reducing policy effectiveness. Clinically, frequent lateness leads to reduced consultation times, incomplete assessments, and potential misdiagnoses, impacting patient outcomes and staff morale. The need to reschedule or expedite care for late patients can compromise the quality of care, particularly for those with urgent foot conditions. The study recommends that managerial support is essential for effective policy implementation, and that mitigation strategies should address underlying causes, such as improving transport access rather than relying solely on punitive measures.

Reference: *J Am Podiatr Med Assoc.* 2025;Jun 3 [Epub ahead of print]

[Abstract](#)

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Association of Baxter's neuropathy and fatty infiltration of the abductor digiti minimi muscle on magnetic resonance imaging: A systematic review

Authors: Chen JSC et al.

Summary: This systematic review examined evidence on the association between fatty infiltration of the abductor digiti minimi (ADM) and entrapment of the first branch of the lateral plantar nerve (Baxter's neuropathy) based on four studies (two retrospective and two cross-sectional observational) including 1052 participants. Quality assessment rated only one study as 'good'. MRI prevalence of ADM fatty infiltration was between 4% and 11% in the general population and was similar in people with (8%) and without (6%) generalised foot pain. There were no studies examining prevalence in populations with plantar heel pain or Baxter's neuropathy.

Comment: This systematic review critically examines the evidence linking fatty infiltration of the ADM muscle on MRI to Baxter's neuropathy, a neural cause of plantar heel pain. The review found that, although fatty infiltration of ADM is observable on MRI, its prevalence is similar in individuals with and without foot pain, and robust evidence directly associating it with Baxter's neuropathy is lacking. Most included studies were of poor methodological quality, with significant risk of bias and confounding, and none specifically recruited patients with plantar heel pain or confirmed Baxter's neuropathy. The clinical implication is clear; clinicians should exercise caution when interpreting fatty infiltration of ADM on MRI as a surrogate marker for Baxter's neuropathy. Such findings may be incidental and unrelated to nerve entrapment, especially when considering invasive interventions like surgery. The review recommends that future research should focus on well-controlled studies recruiting patients with plantar heel pain, controlling for confounders such as obesity, and using higher-strength MRI protocols. Until stronger evidence emerges, the presence of fatty infiltration on MRI should not be used in isolation to guide clinical decision-making for Baxter's neuropathy.

Reference: *J Foot Ankle Res.* 2025;18(3):e70075

[Abstract](#)

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Impact of systematic ultrasonography on lateral ankle sprain management

Authors: Arcade A et al.

Summary: This retrospective study examined the use of routine ultrasonography after 51 lateral ankle sprains to determine treatment strategy and to identify osseous and ligamentous injuries. Treatment was modified for 16 (31.3 %) ankles after ultrasonography examination ($p < 0.05$), which also had excellent sensitivity (0.73) and specificity (0.95) for identifying osseous injuries. Ultrasonography detected injuries to the anteroinferior talofibular ligament in six ankles, deltoid ligament in 16, bifurcate ligament in two, and spring ligament, calcaneocuboid ligament, and dorsal talonavicular ligament in one ankle each.

Comment: This French-based research demonstrated that routine ultrasound following lateral ankle sprain leads to significant changes in clinical management, with treatment modified in 31% of cases. Ultrasonography was shown to have high sensitivity (0.73) and specificity (0.95) for detecting osseous injuries, and it reliably identified ligament injuries, including those not detected by clinical examination or plain radiographs. Notably, ultrasonography detected associated injuries to the deltoid, spring, calcaneocuboid, dorsal talonavicular, and bifurcate ligaments, which are clinically relevant for prognosis and management. Clinically, these findings support the integration of ultrasonography into the diagnostic algorithm for lateral ankle sprain, moving beyond reliance on clinical examination and X-ray alone. Early and accurate identification of injury severity and associated lesions enables tailored treatment, potentially reducing the risk of chronic instability, post-traumatic osteoarthritis, and long-term disability. The study also highlights ultrasonography as a cost-effective, accessible, and dynamic bedside tool, though its operator dependency and limitations in visualising deep structures must be considered.

Reference: *Foot Ankle Surg.* 2025;Sept 11 [Epub ahead of print]

[Abstract](#)

Patient and health professional perceptions of the assessment, diagnosis and management of acute Charcot neuro-osteoarthropathy at a regional Australian health service

Authors: Diacogiorgis D et al.

Summary: This Australian qualitative study assessed the perceptions of nine patients and health professionals (3 orthopaedic surgeons, 5 podiatrists, and 5 prosthetists and orthotists) on the assessment, diagnosis and management of acute Charcot neuro-osteoarthropathy. Thematic analysis of semi-structured interviews identified four themes: barriers to evidence-based care (delayed diagnosis, limited clinicians and diagnostic tools, burden of treatment); enablers (access to clinicians and resources); mitigating factors (patient engagement, empathetic communication, multidisciplinary support); and strategies for improvement (public and professional education, health professional upskilling, integration of psychological and person-centred support).

Comment: This qualitative study explores the perspectives of both patients and health professionals regarding the challenges and enablers in the care of acute Charcot neuro-osteoarthropathy in a regional setting. The research highlights significant barriers, including delayed diagnosis, limited access to skilled clinicians and diagnostic tools, and the burden of treatment, particularly in rural areas. Both groups identified knowledge gaps among health professionals and patients, poor access to multidisciplinary teams, and financial constraints as key obstacles. Conversely, timely access to knowledgeable clinicians, empathetic communication, and multidisciplinary support were seen as crucial enablers. Clinically improving outcomes for acute Charcot neuro-osteoarthropathy requires targeted education for both the public and health professionals, upskilling staff in regional areas, and embedding patient-centred and psychological support into care pathways. Strategies such as awareness campaigns, earlier diabetes screening, and remote monitoring via telehealth are recommended to ensure timely diagnosis and equitable care. Ultimately, the findings advocate for a multifaceted approach that addresses systemic barriers and prioritises patient engagement, aiming to improve quality of life and reduce the risk of long-term disability for those with Charcot neuro-osteoarthropathy.

Reference: *J Foot Ankle Res.* 2025;18(3):e70079

[Abstract](#)

A novel approach to plantar fasciitis treatment: Pulsed electromagnetic field (PEMF) therapy

Authors: Bromley C et al.

Summary: This case series assessed the use of pulsed electromagnetic field (PEMF) therapy in 12 patients with more than 2 weeks of heel pain due to plantar fasciitis. After 12 weeks of treatment, mean Patient Specific Functional Scale (PSFS) survey scores improved by 166%, mean hypoechoic region width decreased by 79%, mean Foot and Ankle Disability Index (FADI) score improved by 46%, and mean plantar fascia thickness decreased by 34%. In historical control data from other studies, PEMF was reduced by 16% with dexamethasone injection and by 6% with placebo saline injection, while FADI was improved by 43% after 1 year of treatment with indomethacin, heat and shoe pads, plantar fascia stretching, or calf stretching and PSFS improved by 96% after primal reflex release treatment.

Comment: This US-based study highlights that PEMF therapy, when combined with stretching, offers a promising conservative treatment for plantar fasciitis. The study found statistically significant improvements in both ultrasound measures and functional scores: plantar fascia thickness decreased by 34%, hypoechoic region width by 79%, FADI scores improved by 46%, and PSFS scores by 166% over 12 weeks. These results compare favourably to historical controls using dexamethasone injection, indomethacin, heat, shoe pads, and stretching, with PEMF showing greater or faster improvements. Clinically, the findings suggest that PEMF therapy is not only effective but also safe, with no adverse effects reported. The rapid reduction in hypoechoic width and improvement in functional scores indicate accelerated healing and restoration of function. Importantly, ultrasound was shown to be a valuable tool for monitoring tissue changes and correlating them with clinical improvement. The study supports the integration of PEMF into the conservative management pathway for plantar fasciitis, especially for patients who have not responded to standard interventions. Given the limitations of steroid injections and NSAIDs, PEMF provides a nonpharmacological, non-invasive alternative that may reduce pain, improve function, and potentially shorten recovery time.

Reference: *J Am Podiatr Med Assoc.* 2025;May 14 [Epub ahead of print]

[Abstract](#)

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Karen Crook (Nurse in Richmond), **Lisa Winters** (Nurse in New Plymouth) and **Jeffery Trafford** (Podiatrist at Upper Hutt Podiatry)

who each were winners of a \$200 prezzie card by taking part in our recent Research Review Annual Subscriber Update.

Plantar heel pain management: A survey of UK registered healthcare professionals

Authors: Drake C et al.

Summary: This UK cross-sectional, online survey examined the management of plantar heel pain by 406 registered healthcare professionals (podiatrists 44.6%, physiotherapists 36.5%, 18% other healthcare professionals). A majority (60.8%) of respondents did not normally use imaging to guide plantar heel pain management. Most (88.4%) provided physical interventions including strengthening (88%), stretching (85.5%) and balance (65.2%) exercises. Orthoses were more frequently prefabricated (56.3%) than custom made (24.2%). Advice on pain management was usually focused on NSAIDs (83%) and simple analgesics (81%). Only 6.4% of respondents performed steroid injections frequently. Patient information was usually provided (88%), but mostly (83%) not in languages other than English.

Comment: This cross-sectional survey provides valuable insights into current practice for plantar heel pain management among UK healthcare professionals. The discussion reveals a strong preference for exercise-based interventions, particularly strengthening and stretching, alongside the use of prefabricated orthoses. Imaging is rarely used to guide management, and steroid injections are infrequently performed, reflecting a shift away from invasive procedures. Advice on NSAIDs and simple analgesics is commonly given, despite evidence suggesting limited effectiveness and potential risks. Most clinicians reported a lack of patient information resources in languages other than English, raising concerns about accessibility and equity of care. Clinically, these findings highlight the importance of evidence-based, conservative management for plantar heel pain, with an emphasis on physical interventions and patient education. The divergence from best practice guidelines regarding taping and custom orthoses suggests a need for ongoing professional development and clearer guidance.

Reference: *J Foot Ankle Res.* 2025;18(4):e70087

[Abstract](#)

Preoperative and postoperative physical and mechanical rehabilitation interventions in hallux valgus: A systematic review

Authors: Gumuskaya O et al.

Summary: This systematic review assessed the effectiveness of physical and mechanical prehabilitation and postoperative rehabilitation in patients undergoing hallux valgus surgery based on five studies. There were no randomised controlled trials assessing preoperative physical or mechanical interventions. Patient outcomes were improved by early postoperative weight-bearing, dynamic metatarsal splinting and transcutaneous ultrasound, while patient satisfaction was improved by rigid-soled footwear.

Comment: This review highlights that foot pain in adults is multifactorial, with significant predictors including female gender, younger age, higher BMI, pronated foot posture (as measured by the Foot Posture Index [FPI]), poorer perceived health, and walking difficulties. The review found that volumetric changes in the foot or shoe size were not significant predictors of hallux valgus when compared to these clinical and demographic factors. Clinically, clinicians should prioritise assessment of foot posture, BMI, and overall health status when evaluating patients with foot pain. The findings support the use of straightforward measures such as the FPI and patient-reported health status to identify individuals at higher risk, enabling targeted interventions. Furthermore, the study emphasises the importance of considering psychosocial factors and mobility in pain management strategies.

Reference: *J Foot Ankle Res.* 2025;18(3):e70083

[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. **FOR FULL BIO** [CLICK HERE](#).



Clinical outcomes of first metatarsophalangeal joint arthrodesis using the BOFAS registry: A prospective cohort study

Authors: Jadhakhan F et al.

Summary: This prospective cohort study assessed outcomes of the British Orthopaedic Foot and Ankle Society (BOFAS) registry first metatarsophalangeal joint (MTPJ) arthrodesis pathway in 459 patients (mean age 64.1 years; 98.9% female) undergoing their first arthrodesis. Twelve months after surgery there were improvement in Patient Reported Outcome Measures (PROMs; all $p < 0.001$), with median scores of 10 for Manchester-Oxford Foot Questionnaire [MOXFQ] pain, 5.5 for walking/standing, 0 for social interaction, 5 for numerical rating scale pain and 0.8 for the EuroQol 5 Dimensions, 5 Levels (EQ-5D-5L).

Comment: This UK based study has shown the significant clinical benefits of first MTPJ arthrodesis, as evidenced by improvements in pain, walking/standing ability, social interaction, and overall quality of life. PROMs showed statistically and clinically meaningful improvements at 12 months post-surgery, with reductions in pain and enhanced mobility exceeding minimal clinically important differences. The BOFAS registry, by systematically capturing PROMs, enables benchmarking of outcomes and supports patient-centred care, allowing clinicians to tailor interventions to individual needs and expectations. Clinically, these findings reinforce first MTPJ arthrodesis as an effective intervention for patients with disabling pain and functional impairment, particularly in cases of hallux rigidus and other degenerative conditions. Overall, the study supports the integration of PROMs into routine practice and highlights the value of national registries in guiding evidence-based surgical decision-making and improving patient outcomes.

Reference: *J Foot Ankle Res.* 2025;18(4):e70084

[Abstract](#)

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