Research — is it academic, challenging or applicable?

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When reading research papers, I always try to focus upon two main issues, as I am sure many of our readers do. Firstly, can I apply and use the research findings in my everyday clinical practice and, secondly, does the research stimulate new ways of thinking or innovation? With this in mind, I want to examine a couple of papers that I think represent this approach. The first looks at a Cinderella complication that causes immense suffering – symptomatic/painful neuropathy – and the other has potential for risk screening for diabetes using a very simple clinical tool.

Painful diabetic neuropathy (PDN), although generally under-reported, is a frequent and clinically difficult complication to manage. Clinical guidelines are based on short-term trials (≤3 months' duration), as there are limited trial data on long-term treatment outcomes. The study by Mai et al (summarised alongside) provides a useful assessment of the long-term clinical effectiveness of standard pharmacotherapies in the management of chronic PDN. In a prospective, multicentre, observational cohort study conducted in Canada, 60 people with PDN (other causes of pain excluded) were identified and recruited for analysis; however, there was a 22% dropout rate. Clinical outcome measures included pain scores and functional improvements (depression, mood and activity) using validated tools.

Pharmacological management mainly comprised opioids, antidepressants and/or anticonvulsants, with half of the participants using two and 25% using three of these drug classes. At 12 months, 37.2% of the cohort achieved a reduction in pain intensity of ≥30%, 51.2% achieved functional improvement and 30.2% achieved both of these outcomes, with no difference between those using two versus three analgesic classes. The study has many limitations but shows that two analgesics are as effective as three, and that long-term pain reduction can be modestly achieved, with better outcomes in terms of functional improvement.

The second paper (summarised on the facing page) reports on the potential use of ankle–brachial pressure index (ABPI) for identifying people who are at risk of developing diabetes! People with peripheral artery disease often have reduced physical activity, which may increase the future risk of diabetes. Hua and colleagues examined the association of ABPI with incident diabetes using Cox proportional hazards models in the ARIC (Atherosclerosis Risk In Communities) study. ABPI was measured in 12 247 people of black or white ethnicity, aged 45–64 years, without diabetes at baseline. For each participant, ABPI measurements were obtained under strict conditions and were divided into seven ranges (≤0.90, 0.91–1.00, 1.01–1.10, 1.11–1.20, 1.21–1.30, 1.31–1.40 and >1.40). Incident diabetes cases were identified at subsequent visits by several methods.

Overall, 3305 participants developed diabetes over a median of 21 years of follow-up. Subjects with low (≤0.90) and borderline low (0.91–1.00) ABPI had a 30–40% higher risk of incident diabetes compared to those with an ABPI of 1.10–1.20. After adjusting for coronary heart disease and other potential confounders, the risk remained significant for ABPI 0.91–1.00 (hazard ratio [HR], 1.17; 95% confidence interval [CI], 1.04–1.31) and marginally significant for ABPI ≤0.90 (HR, 1.19; 95% CI, 0.99–1.43). There was a stronger association in people without hypertension, those with normal fasting glucose, and those with a history of stroke compared to their counterparts. This study suggests that a low ABPI may be a useful potential indicator for increased risk of developing diabetes. ■

Can J Neurol Sci

12-month outcomes in management of painful neuropathy

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! Factor	✓✓✓

1 This real-world, prospective observational study was conducted to assess the long-term (12-month) clinical effectiveness of painful diabetic neuropathy (PDN) in seven tertiary pain centres in Canada.

2 In total, 60 people with type 1 or type 2 diabetes and clinically diagnosed PDN were enrolled; however, 13 (22%) dropped out, leaving 47 with evaluable data.

3 At 12 months, 37.2% of participants had achieved a ≥30% reduction in pain intensity according to the Brief Pain Inventory (BPI), and 51.2% had a reduction of ≥1 point in the pain interference scale of the BPI.

4 Overall, 30.2% achieved the primary outcome, a composite of the previous two outcomes.

5 Small but significant improvements in the Short-Form Health Survey and Pain Catastrophizing Scale scores were also observed at 12 months.

6 Overall, 55.3% of participants received two classes of analgesic and 25.5% received three. However, there was no difference in primary outcome achievement rates between these two groups.

7 Notably, opioid users were no more likely to achieve the primary outcome than non-opioid users.

8 This study is limited by the small cohort, high dropout rate and potential referral bias given that all centres were tertiary pain clinics. Nonetheless, it appears that nearly one third of people with PDN can have significant long-term improvements in pain and function.

Mai LM, Clark AJ, Gordon AS et al (2017) Long-term outcomes in the management of painful diabetic neuropathy. *Can J Neurol Sci* 9 Jan [Epub ahead of print]

Cardiovasc Diabetol

Low ankle–brachial pressure index predicts incident diabetes

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! Factor	✓✓✓✓

1 Diabetes is a well-known risk factor for peripheral artery disease (PAD), but it is not yet known whether PAD is, in turn, a risk factor for developing diabetes.

2 Therefore, these authors sought to investigate whether ankle–brachial pressure index (ABPI) was associated with incident diabetes in a community-based cohort from the ARIC (Atherosclerosis Risk in Communities) study.

3 A total of 12 247 people without diabetes had their ABPI measured and were then followed up over a median of 21 years. During this time, there were 3305 cases of incident diabetes.

4 The mean ABPI at baseline was 1.13. Overall, 455 people (3.7%) had low ABPI (≤0.90) and 1529 (12.5%) had borderline low ABPI (0.91–1.00).

5 Compared with the reference ABPI range (1.11–1.20), people with low and borderline low ABPI at baseline were more likely to develop diabetes (hazard ratio [HR], 1.41 and 1.29, respectively.

6 The associations were weakened but remained significant after adjustment for confounding factors, including (self-reported) physical activity.

7 The authors conclude that low ABPI is independently associated with diabetes risk, and that clinicians should pay attention to the blood glucose trajectory in such people.

Hua S, Loehr LR, Tanaka H et al (2016) Ankle–brachial index and incident diabetes mellitus: the Atherosclerosis Risk In Communities (ARIC) study. *Cardiovasc Diabetol* **15**: 163

J Diabetes Complications

Modelling cost savings from DFU prevention efforts

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! Factor	✓✓✓✓

1 The aim of this study was to determine the cost-effectiveness thresholds for primary prevention of diabetic foot ulcers (DFUs) and their complications.

2 Data from previously published studies were used to create a Markov model simulating 5-year survival, DFU incidence and total healthcare costs in a hypothetical population of 100 000 people with diabetes.

3 Primary prevention efforts directed at people at moderate or high risk of DFUs were found to be very likely to provide cost-savings if DFU incidence was decreased by ≥10% and/or the cost was less than US$150 per person per year.

4 Such measures could include daily foot thermometry, podiatric care at regular intervals or direct group or one-to-one education.

5 Perhaps surprisingly, low-cost prevention efforts directed at the general diabetes population were more cost-effective, with interventions that provide a ≥10% reduction in DFU incidence at a cost of <$50 per person per year found to be very likely to create cost savings.

6 Such efforts might include brochures explaining the Ipswich Touch Test or activities for maintaining foot health; mobile phone-based reminders or education programs; mailed reminders about scheduling foot exams; and advice on appropriate footwear in the setting of sensory neuropathy or structural foot abnormalities.

Barshes NR, Saedi S, Wrobel J et al (2017) A model to estimate cost-savings in diabetic foot ulcer prevention efforts. *J Diabetes Complications* **31**: 700–7

J Eur Acad Dermatol Venereol

Efficacy of an emollient cream for xerosis in people with diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! Factor	✓✓✓

1 Xerosis (dry skin) is a mild complication of peripheral neuropathy; however, it is a risk factor for diabetic foot ulceration and is recommended to be treated.

2 In this study, funded by the manufacturer, the efficacy of an emollient with glycerol and paraffin as its active ingredients (Dexeryl®; Pierre Fabre Medicament, Boulogne, France) was assessed.

3 In total, 57 people with diabetes and dry foot skin (score of 4–6 on the 9-point Xerosis Assessment Scale [XAS]) were treated with the emolient on one foot and the vehicle alone on the contralateral foot. All were treated for 28 days.

4 The primary outcome measure, mean XAS score, was 5.2 at basline and fell to 4.1 in the vehicle arm and 3.2 in the emollient arm (P=0.001 for comparison between treatments) at 28 days.

5 The emollient was also superior to the vehicle in terms of overall skin score, hydration index, D-Squame test, skin roughness and patient satisfaction.

6 Seventeen adverse events were reported in 23.2% of study participants; however, only one of these (interdigital maceration and crack) was judged to be a result of the study treatment.

7 Although limited by a short follow-up, this study suggests that emollients are effective and safe in the management of xerosis.

Martini J, Huertas C, Turlier V et al (2017) Efficacy of an emollient cream in the treatment of xerosis in diabetic foot: a double-blind, randomized, vehicle-controlled clinical trial. *J Eur Acad Dermatol Venereol* **31**: 743–7

> *"The authors conclude that low ankle–brachial pressure index is independently associated with diabetes risk, and that clinicians should pay attention to the blood glucose trajectory in such people."*