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TITLE The practical applicability of post-debridement tissue sampling and punch biopsy methods in a pragmatic sample of adults with diabetes-related foot infections (DFIs): An observational study

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ABSTRACT (maximum 450 words. Please use the following or similar headings: Background/Methods/Results/Conclusions)

Background:
Aseptically collected tissue is currently the recommended wound sampling method to guide antimicrobial therapy for DFIs. Tissue can be collected by traditional methods (i.e. scalpel debridement) or with a punch biopsy tool. However, the feasibility of these methods in people with DFIs in real-world clinical settings may be limited by factors such as wound location, reduced arterial supply or wound size. This study aimed to evaluate the feasibility of obtaining tissue specimens in a sample of patients with DFIs by determining the proportion and characteristics of patients unable to have post-debridement tissue and/or punch biopsy due to contraindications. Understanding the practical applicability will help guide future clinical guidelines.

Methods:
A prospective observational study of adults with DFIs presenting to the Royal Melbourne Hospital. Patients were consecutively recruited then assessed for wound size and peripheral arterial disease by a podiatrist to determine whether tissue sampling was appropriate. Outcomes of interest included the proportion of patients who could successfully complete the sampling, proportion for whom it was contraindicated, reasons for exclusion (e.g. anatomical location, presence of peripheral arterial disease (PAD) and wound size) and adverse events. Descriptive statistics were used to determine proportions and associated factors.

Results:
A total of 129 participants with DFIs were screened for eligibility to undergo a wound swab, post-debridement tissue sample and punch biopsy. 29 (22.5%) deemed ineligible for inclusion due to contraindications for either tissue sampling method. The ineligible cohort was predominantly male (86.2%) with a mean age of 68 years. One participant identified as Aboriginal or Torres Strait Islander. Most participants were inpatients (n=25) and all patients had type 2 diabetes mellitus (T2DM). Ethnicity was self-reported, with most identifying as Oceanian (n=17, 58.6%), followed by Southern and Eastern European (n=7, 24.1%).
The WIfi ischaemia grading among the ineligible participants was Grade 0 (n=11), Grade 2 (n=6) and Grade 3 (n=12). Infection severity varied with Grade 1 (n=5), Grade 2 (n=16) or Grade 3 (n=8). Chronic kidney disease was common (n=14). Anticoagulant use was frequent (n=19) and antibiotic allergies were reported in three participants.
The reasons for ineligibility were poor arterial supply, with toe pressure < 40 mmHg precluding punch biopsy (n=9) or toe pressure <30mmHg precluding post-debridement tissue sampling and wound debridement (n=11). Additional exclusion reasons included wound diameter <5mm (n=5) and clinical contraindications such as necrosis (n=3), exposed bone (n=3) and patient isolation requirements (n=1). Some participants met multiple exclusion criteria (n=10).

Conclusions:
While tissue specimens remain imperative to guide antimicrobial therapy in DFIs, its practical applicability is limited in a significant proportion of patients. These findings highlight the need to explore the similarity of alternative sampling methods in certain clinical scenarios and should inform future clinical decision-making in the management of DFIs.