Toe blood pressure and the toe brachial index for predicting foot wound healing: systematic review
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Background
Chronic foot wounds are a growing international concern as the incidence of risk factors such as diabetes, obesity, vascular disease and advancing age rises. Adequate blood flow to the most distal parts of the foot is essential for wound healing and to avoid amputation. Toe blood pressure and the toe brachial index (TBI) provide information on perfusion of the distal tissues and skin of the foot. This systematic review and meta-analysis was performed to determine the prognostic capabilities of toe blood pressure and the TBI for predicting chronic foot wound healing or progression to amputation.

Methods
The medical databases MEDLINE, CINAHL, EMBASE, PubMed Central and the reference lists of retrieved studies were systematically searched in June 2014. Two authors independently reviewed selected studies reporting original research. Methodological quality was assessed using STROBE and CASP appraisal tools.

Results
Ten studies were reviewed; six investigated wound healing and four investigated amputation as the primary outcome. Study quality was inconsistent; most failed to report aspects of their methodology and different equipment or techniques were used. The use of serial assessments resulted in greater predictive ability than a single measurement. Meta-analysis indicated a cut-off toe blood pressure of 30mmHg was associated with an odds ratio of 3.25 (95% CI: 1.96, 5.41) for risk of non-healing, however, significant heterogeneity was found (I2 = 73.9%, p=0.001).

Conclusions
Toe blood pressure and the related TBI may be useful in predicting the outcome of chronic foot wounds, however, further high quality research is required before clinical utility is confirmed. The use of serial assessments taken over time or a grading system of toe blood pressure and TBI values may improve accuracy and utility.