

# What Factors Predict Amputation? Results of Over 2 Years of Follow-up from a Large Secondary Care Multidisciplinary Diabetic Foot Clinic

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**Background and Aims:** Ulceration in a diabetic foot is a well recognised leading cause of amputation<sup>1,2</sup>. It has been well demonstrated for many years that the multidisciplinary approach helps to improve outcomes<sup>3,4</sup>. The risks for amputation include poor glycaemic control, PAD, infection, and the presence of other diabetes related microvascular complications such as poor eyesight and chronic kidney disease. However, the relative contributions made by each of these factors is not clear.

We aimed to establish which factors predict the risk of amputation in patients attending the diabetic foot clinic at our large secondary care institution in order to predict and prevent limb loss in the future.

**Methods:** A retrospective case note analysis of patients referred to the diabetic foot clinic between September 2009 and December 2011. Only patients who attended  $\geq 2$  consultant led clinic appointments within 6 months were included, patients who were only seen in the podiatry led clinics, with uncomplicated wounds, were excluded. Baseline data was collected on several markers of health including HbA1c, and co-morbidities, using the Charlson index. Patients were followed up for a minimum of 1 year. A primary model analysis grouped patients according to those who did & did not undergo amputation. An additional analysis compared factors & outcomes in those managed in primary care vs secondary care prior to referral. Chi-squared tests were used for intergroup statistical analysis.

	Amputations (n=33)		Reference Value	Odds Ratios (95% Confidence Interval)		Adjusted p value*
	Yes	No		Unadjusted	Adjusted	
Missed Clinic Appointments	21/75	12/91	Yes	2.56 (1.16 to 5.64)	8.77 (1.96 to 39.30)	0.0079
Charlson Index < 5	7/69	26/96	Yes	0.31 (0.13 to 0.76)	0.272 (0.09 to 0.82)	0.0204
Hypertension	32/131	1/34	No	0.09 (0.01 to 0.71)	0.03 (0.002 to 0.52)	0.0159
Peripheral arterial disease	14/48	19/117	No	0.471 (0.21 to 1.04)	1.21 (0.31 to 4.81)	0.7105
HbA1c > 58 mmol/mol	25/107	8/58	No	0.52 (0.22 to 1.25)	0.14 (0.04 to 0.53)	0.0036
Previous revascularisation	6/10	27/155	No	0.141 (0.04 to 0.53)	0.04 (0.004 to 0.35)	0.0022
*Likelihood Ratio Chi-square						

**Results:** 165 patients met the inclusion criteria. M:F 121:44. The Table shows the major results. More patients managed in primary care prior to referral had good glycaemic control at baseline compared to those managed exclusively in secondary care: HbA1c  $\leq 58$  in primary vs secondary care (50% vs. 26.2%,  $p = 0.0019$ ) & also a lower rate of amputation: primary vs secondary care (n=10/23)

Overall, 34.9% (n=58) of patients had good glycaemic control (HbA1c  $< 58$ mmol/mol) at baseline & 81.3% (n=135) had an improved glycaemic control at their last follow up appointment

**Discussion:** In this cohort poor attendance, higher comorbid state, & hypertension were associated with higher risk of amputation, with the presence of PAD showing a strong trend towards being a risk factor. Good prior long term glycaemic control and previous revascularisation predicted a lower likelihood of amputation. Moreover, this study showed that attendees to the foot clinic lowered their HbA1c whilst under the care of the specialist multidisciplinary diabetic foot clinic. This is likely to translate to longer term diabetes related health benefits

