

**A VIRTUAL DIABETES CLINIC: EFFECT ON OUTPATIENT CLINIC VOLUMES**

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## Introduction

Traditional outpatient services do not necessarily meet the needs for patients with a chronic disease such as diabetes. Due to the increasing burden of disease the majority of care takes place in the primary care setting with the patient being referred to secondary care only when a significant complication occurs or the disease becomes unstable. In this situation the patient and their primary care team require advice regarding changes to management that is timely. The decision making process for the specialist is generally straight forward apart from the most complex cases. If adequate information is received from the primary care team these decisions can often be made without necessarily seeing the patient in the outpatient clinic. This allows decisions to be made sooner and without interrupting the patient-GP relationship.

It also was apparent that the number of patients not attending their new patient appointments was significant and was a major source of wasted resource. It was calculated that, for the years of 2007 and 2008, 35 hours of specialist physician time was lost through DNA's at the diabetes clinic every 6 months.

The concept of providing a virtual clinic was to provide a structured service that provided timely advice to general practitioners regarding their patients with diabetes. The core aims were to provide telephone or written advice in an effort to reduce the demand on the diabetes outpatient clinic.

## Methods

A virtual clinic was held weekly lasting 90 minutes on each occasion. During this time all referral letters to the diabetes clinic were assessed and those that were deemed appropriate for the virtual clinic were identified. Those that were not accepted were those that had a significant complication of diabetes or who were judged as having significant metabolic instability such that urgent assessment in clinic within 1 week was necessary. All other patients were reviewed in the virtual clinic.

One clinician (PM) reviewed all referrals to identify the reason for referral. Where necessary the patient's general practitioner was contacted for further information.

Generally the indication for referral was apparent and the appropriate change to management was identified. A decision was then made as to whether the patient required formal review in the outpatient clinic by a consultant physician, input from a diabetes nurse specialist with advice from a consultant, or simply advice to the general practitioner.

The trial of the Virtual clinic commenced in June 2009 and finished at the beginning of December 2009, therefore lasting 6 months. During this time the clinic was held each Tuesday morning from 0900-1030. It was estimated based on prior referral rates that this would allow approximately 15 minutes for each referral to be assessed and dealt with.

In the latter case a telephone call and/or a letter was written to the general practitioner with the advice. It was made explicitly clear that if the planned intervention was ineffective then the patient should be re-referred to the clinic at which time the patient would be formerly assessed in the outpatient setting.

One Primary Health Organisation (Well Dunedin) was approached to partner in this initiative. This PHO advertised the availability of the Virtual Diabetes Clinic to their members (see appendix 1). A range of contact mechanisms were made available including direct phone, e-mail and written.

The main outcome measure was the number of new patients that were seen in the diabetes outpatient clinic at Dunedin Hospital during the 6 month period of the trial. We compared this to the average number of patients seen in a 6 month period during the same time period for the previous 2 years. The Dunedin Hospital patient management system accurately records all patients seen in the Diabetes clinic as new or follow-up patients and provides accurate data on the number of their visits over a given period.

## Results

During the two years prior to the commencement of the virtual clinic the number of patients seen in the outpatient clinic during the corresponding time of the year is shown in Table 1. The mean number of new patients seen in the outpatient clinic over

the 6 month period was 106. The new patient numbers for the period of the virtual clinic trial was 61. This comprised 34 patients that were urgent cases or had already been booked into the outpatient clinic prior to the trial commencing; or were among the 27 patients that were deemed inappropriate for assessment in the virtual clinic.

60 patients were deemed suitable to be reviewed through the Virtual Clinic during the 6 month period (Table 2). Of the 60 referrals assessed, 33 were able to be managed without requiring an outpatient appointment. The remainder (27) were seen in the outpatient department as noted above. There were no patients that were dealt with by the virtual clinic that subsequently required assessment in the outpatient clinic during the trial period.

The majority of patients that were referred had problems related to poor glycaemic control and 26/37 of these patients could be managed through the virtual clinic. Patients with Type 1 diabetes did not necessarily require assessment in the outpatient department with approximately 25% being managed successfully in the virtual clinic. Those with acute complications of diabetes, hypoglycaemia and newly diagnosed Type 1 diabetes required formal outpatient clinic assessment.

Apart from a few instances the referrals to the diabetes department were not directly to the Virtual Clinic and were via the usual referral process to the diabetes outpatient services.

## Discussion

This brief six month intervention with a virtual diabetes clinic resulted in a significant reduction in patients requiring formal assessment in the outpatient department. There was approximately a 40% reduction in new patient appointments required during the trial. This number may have been greater if patients that had previously not been booked in to the clinic prior to the commencement of the study had been excluded.

Of those that were deemed suitable to be assessed in the virtual clinic 36/63 (57%) were able to be managed without formal outpatient assessment. The majority of these people had Type 2 diabetes and had been referred for improvement of glycaemic

control. These patients were managed either with advice to the general practitioner by way of telephone advice or written letter or were referred to the diabetes nurse educator for review and advice. If the latter was chosen then the general practitioner was informed that a physician review was deemed unnecessary at that time but the option was left open for re-referral if the problem was not adequately resolved.

Patients with Type 1 diabetes are more likely to require a specialist physician outpatient assessment. This is because it is difficult to give appropriate advice with respect to improving glycaemic control for these patients without reviewing SBGM results. These are seldom included in the referral by the general practitioner. With the advent of electronic delivery of SBGM results it is probable that advice for patients with Type 1 diabetes could also be given from a virtual clinic. Clearly, for many patients the reason for the instability of their glycaemic control or the development of complications is multifactorial. For these patients it is likely that a clinic assessment would be more successful given its holistic approach. It is not known however whether clinic assessment is superior to virtual advice without undertaking a randomised controlled trial to compare these two interventions.

The quality of referral letter and the amount of information was identified as an important predictor of whether the patient could be managed through the virtual clinic. Those referrals which contained insufficient information often resulted in the patient being seen in the outpatient clinic. It is likely that standardised referral forms that require particular referral information would increase the number of patients that could be seen in a virtual clinic. Ease of making the referral is important and the ability to be able to electronically make the referral to a single portal would be preferable.

It was apparent that the advertisement of the Virtual Clinic to the PHO members was not particularly effective. Referrals directly to the Virtual Clinic were few. It is likely that more effective advertising and promotion of the concept of a Virtual Clinic would improve its effectiveness. Referrals would likely be made at an earlier point if simple advice was being sought rather than assessment of the patient in the outpatient clinic being required. Simply intercepting referrals to the outpatient department is not the ideal way to identify the most appropriate referrals for a Virtual Clinic.

In conclusion, a virtual diabetes clinic can substantially reduce the number of patients that are required to be seen in the outpatient diabetes service. Improved referral information could improve the effectiveness of such a service. This type of service should be considered as part of that provided by specialist diabetes services.

Table 1: New Patient Volumes in the Diabetes Clinic for corresponding periods of the year for 2007 and 2008 (pre- virtual clinic) and 2009 (virtual clinic period)

Time Period	Number Seen
May 2007- November 2007	106
May 2008 – November 2008	104
May 2009- November 2009	61

Table 2:

	Virtual Clinic	Outpatient Clinic
Number (n=60)	33	27
Gender (M/F)	15/18	18/9
Age	56.7	45.9
Type 1 diabetes	8	10
Type 2 diabetes	25	17
Poor glycaemic control	26	11
Hypoglycaemia	1	3
Diabetes complication	0	5
Newly Diagnosed	4 (all Type 2)	4 (all Type 1)
Other	2	4

Appendix 1: Well Dunedin PHO advertisement to its members