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# GPs with special interests

## Impacting on complex diabetes care

### Background

The growing prevalence and impact of type 2 diabetes mellitus is of international concern.

### Objective

This article describes an innovative model of complex diabetes care, delivered by advanced skill general practitioners supported by an endocrinologist and diabetes educator within a general practice setting.

### Discussion

Initial evaluation suggests a trend to better glycaemic control compared with the alternative available hospital outpatient care at a reduced delivery cost. A futuristic, integrated community/specialist model, delivered within a general practice setting, can deliver significant gains for Australians who have complex type 2 diabetes mellitus.

**Keywords:** diabetes; primary healthcare; healthcare reform



The personal, health system and economic costs of the increasing prevalence of type 2 diabetes mellitus is of national and international concern.<sup>1,2</sup> Despite significant efforts from health authorities, government, clinician groups and communities over the past decade, its prevalence and consequent impact on the healthcare system continues to grow.<sup>3</sup>

Much of the personal impact, service utilisation and cost are linked to patients with complex diabetes – long term disease with poorly controlled blood sugar levels and established complications. These patients are often on maximal oral therapy and their needs exceed that which is deliverable within their primary care setting so they struggle to access

pressured specialist services. Although we know improved glycaemic control significantly reduces microvascular and macrovascular complications, only 50.5% of patients with type 2 diabetes mellitus who are on tablets and 23.9% who are on insulin are achieving treatment targets.<sup>4</sup> The United Kingdom Prospective Diabetes Study (UKPDS) study showed a 1% reduction in HbA1c over 10 years from diagnosis results in a 37% reduction in diabetes microvascular complications, 21% reduction in diabetes related deaths, and 14% reduction in myocardial infarction.<sup>5</sup> The 10 year follow up study confirmed a significant reduction in risk of myocardial infarction and overall mortality if patients with type 2 diabetes mellitus are intensively treated from diagnosis.<sup>6</sup>

International studies have demonstrated the value of general practitioners with special interests (GPwSI) in addressing care needs that exceed those uniformly available in primary care.<sup>7-9</sup> This paper describes an innovative model of care for complex diabetes, delivered by advanced skilled GPs within a general practice setting with support from an endocrinologist. We report the service's impact on the primary reason for referral to the service – glycaemic control. Data collection on further micro- and macro-vascular risk factors is ongoing and will be the subject of future publication.

### Method

#### Brisbane South Complex Diabetes Service

In 2006, the Endocrinology Department of the Princess Alexandra Hospital (PAH), a tertiary referral hospital in Brisbane South (Queensland), identified the 12 month patient wait for complex diabetes assessment and care as unacceptable. Working with the University of Queensland Discipline of General Practice, they partnered in

an integrated primary/specialist community model of diabetes care for Queenslanders with complex type 2 diabetes mellitus. Initial methodology was developed<sup>10</sup> and ethics approval was obtained from the Southside Health Service District. The Brisbane South Complex Diabetes Service (BSCDS) is delivered from within a large general practice, Inala Primary Care. Patients referred by their GP for specialist outpatient department assessment, who reside within the 21 postcodes surrounding Inala Primary Care, are offered care via the BSCDS rather than PAH specialist outpatient department. This care is provided by a multidisciplinary team consisting of an endocrinologist, advanced skilled GPs known as 'clinical fellows', a credentialed diabetes educator, and a podiatrist, with additional allied health on referral, depending on patient need. The clinical fellows are experienced local GPs who have undertaken postgraduate training in advanced diabetes care via the University of Queensland Master of Medicine (General Practice).<sup>11</sup>

### Process of care

Patients initially undergo a comprehensive screening assessment by a credentialed diabetes educator care coordinator. This includes a review of medications, diabetic history, retinal photographs, foot assessment, depression screen and appropriate blood and urine testing, before booking for the next available 'diabetes clinic' (a 4 hour session involving one endocrinologist, two to three GPwSIs, the diabetes educator and a podiatrist). All patients at clinic are first assessed by one of the clinical fellows, who clarifies the history and medications, examines the patient, interprets the retinal photographs and pathology results, and drafts a management plan addressing glycaemic control, blood pressure, lipids, lifestyle, diabetes complication management and patient priorities. Evidence based guidelines inform all management planning. The plan is discussed with the attending endocrinologist, who then briefly co-consults with the patient and clinical fellow together to finalise the approach. This co-management model allows the endocrinologist to attend 2–3 times the number of patients per clinic than is possible via the traditional specialist outpatient department model.

If required, time with the diabetes educator is usually arranged for the same clinic, and other allied health appointments at a time convenient for the patient. Patients initiating or altering insulin

regimens are enrolled in the Insulin Stabilisation Service, where patients are contacted by telephone twice weekly by the diabetes educator regarding insulin adjustment, according to defined protocols. These insulin dosage adjustments are reviewed by a doctor within a week. Thirty-nine percent of patients were on insulin at service referral and this rose to 71% at 12 months.

The patient's GP is kept closely informed of care management (currently by letter but shortly this will change to being via a shared web based record). They are asked to include the patient's latest GP Management Plan or Team Care Arrangement with the booking visit, and to ensure patients have been appropriately assessed and supported by diabetes education and dietary and lifestyle advice before referral. All patients are encouraged to attend weight loss and self management courses conducted within their local community. The management plan is sent to the patient's usual GP within 1 week, with expectations of the service, patient and GP clearly outlined. Patients are discharged to the care of their usual GP once targets have been achieved, or following the 12 month review if there is no evidence of possible improvement. The diabetes educator contacts all patients at 6 weeks and 3 months to assess progress, motivate and troubleshoot. General practitioners are provided with a direct contact number at the service for queries, concerns and rapid reassessment of patients if required.

Patients with diabetic foot complications are managed by a team made up of the clinic podiatrist, clinical fellow and endocrinologist, with the aim of preventing admissions to hospital and allowing management of the high risk diabetic foot within the patient's local community.

The BSCDS also provides a hub for ongoing hands on training in complex diabetes management for clinical fellows from other parts of the state, special skills general practice registrars, general physician advanced trainee registrars and nurse practitioners.

### Business model

Inala Primary Care covers the clinical fellows' salary and service running costs via Medicare billing. The salary for the endocrinologist and podiatrist for one session per week and the full time diabetes educator was provided via grant money from Queensland Health's Innovation, and Connecting Healthcare In the Communities funding, but switched to District Health funding via the southside partnership council from 1 July 2010.

### Initial impact

Glycaemic control in the cohort of all new patients enrolling with the service in 2008 and requiring 12 month review in 2009, was compared with the same cohort reviewed at PAH specialist outpatient department, using an analysis of covariance (*Table 1*). The difference in initial HbA1c between the cohorts on referral is likely a reflection of the difference in socioeconomic status between them, with the immediate Inala catchment one of significant disadvantage. Mean HbA1c fell significantly over the 12 month timeframe in the BSCDS cohort, from 9.0±2.0 to 7.6±1.7 ( $p=0.0001$ ) and nonsignificantly in the PAH specialist outpatient department cohort, from 8.3±1.9 to 8.1±1.8 ( $p=0.23$ ). The HbA1c of the BSCDS cohort was significantly lower than that of the PAH cohort at 12 months, after adjusting for differences in HbA1c at enrolment ( $p=0.001$ ). The specialist outpatient department cohort had a higher percentage of nonattenders at the 12 month follow up (24%) than did the BSCDS (10%).

### Cost

Total mean cost per patient attendance was the only available common economic benchmark with which to provide any comparison of the costs of service delivery via the two care models. Total mean attendance cost per patient attendance at PAH specialist outpatient department was \$774 over this period compared

**Table 1. Glycaemic control for newly referred patients with type 2 diabetes mellitus at baseline and 12 months at the BSCDS (n=99) and PAH (n=67)**

	Baseline		12 months	
	BSCDS	PAH	BSCDS	PAH
HbA1c (mean ± SD)	9.0±2.0	8.3±1.9	7.6±1.7	8.1±1.8
% achieving HbA1c ≤7%	14.1 (14)	28.4 (19)	45.5 (45)	32.8 (22)

with \$150 at the BSCDS. These figures were inclusive of all medical, nursing, allied health, IT, service and administration costs and consumables, as well as all Medicare, Commonwealth and state health costings, excluding pathology. Patients at the BSCDS, however, attend more frequently, having on average 4.3 doctor visits over the 12 months compared to PAH's 1.8 and 2.4 visits with the diabetes educator (including the screening visit) compared with 0.3 at PAH specialist outpatient department.

The wait time for assessment at the BSCDS is currently 4 weeks from referral.

## Discussion

Addressing the growing morbidity associated with diabetes is a national priority. Our work has demonstrated that an integrated patient centric community model, maximising the skills and strengths of each team member, can make important clinical and cost of patient care differences for Australians with complex type 2 diabetes mellitus. Our work has also demonstrated GPs to be willing, able and ready to complement their traditional holistic skills with areas of advanced skill. Our approach is currently being replicated in a number of other areas across Queensland, could be applicable to other chronic renal or cardiac conditions, and is the endorsed model at the University of Queensland's three GP superclinics (to commence operation in 2011).

The National Health and Hospital Reform Commission and National Primary Care Strategy lay down a challenging but important vision for our country's healthcare future signalling significant change to deliver a sustainable healthcare system for Australian communities. Front and centre of this new challenge is a better integrated, community delivered healthcare system, with general practice the essential lynchpin. Models such as ours demonstrate the benefit of linking the strengths and potential of general practice with innovative, outcome focused, public sector support.

## Authors

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