



Initiating a PDSA cycle

Improving management of diabetes in rural WA

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Diabetes affects 1 million Australians and is the seventh leading cause of death in Australia.¹ General practitioners play an important role in the management of diabetes,^{2,3} especially in rural areas where there is limited access to specialist providers and services.^{4,5}

A number of studies have investigated diabetes management and outcomes in rural Australia, however these have been based predominantly in either Aboriginal communities or specialist centres,⁶⁻⁸ or relied on Medicare occasions of service data or divisions of general practice based diabetes registers.^{4,9} General practitioner patient records are the most complete documentation of diabetes management and audits have been shown to result in improved GP care.^{14,15}

This study took place in midwest Western Australia, a diverse region with a population of 45 000 including a regional centre of approximately 30 000 and numerous small towns. Indigenous people comprise 7% of the total population. The region does not have tertiary care professionals or facilities for complex diabetes management. Primary medical care is provided by 42 GPs in private practice and an Aboriginal medical service. Using the 'plan, do, study, act' (PDSA) quality improvement cycle,¹⁰ an audit was designed to assess the quality of care and clinical outcomes and to develop interventions to improve them.

Methods

The study used a cluster sample design. A random sample of 15 GPs agreed to participate as part of a registered continuous professional development activity. Fourteen of the 15 GPs generated a list of patients with diabetes from their electronic records system and the remaining GP identified current patients from paper based files. Up to 20 patients per GP who had received care for 2 or more years by their GP were

randomly selected from the complete lists. Paper and electronic records were audited using quality of care and clinical outcome targets derived from Royal Australian College of General Practitioners (RACGP) guidelines.¹² Two registered nurses recorded data spanning January 2003 to December 2004. Results were also benchmarked to the 2002 cohort of the National Divisions Diabetes Program (NDDP) register data from 61 divisions of general practice.⁹ Confidence intervals, reflecting the clustering of patients by GPs, were calculated using the CSAMPLE program within EPI-Info.¹³ Where the NDDP levels lay outside the 95% confidence intervals of the study they were considered statistically different.

This project was exempted by the University of Western Australia Ethics Committee as a quality assurance project.

Results

Medical records of 253 patients were audited. The mean patient age was 62 years; 54% were male. Most patients (93%) had type 2 diabetes and over half (56%) were treated with tablets alone. From the medical records, 8% of patients identified as Aboriginal or Torres Strait Islander, and 13% were smokers; however these characteristics were not stated in 86% and 43% of the records respectively.

Quality of care

Over 70% of patients had haemoglobin A1c (HbA1c) and blood pressure screened within the recommended intervals and 63% had their lipids screened (*Table 1*). The midwest rates for these screening procedures are not statistically different from those estimated by the NDDP. Less than half the patients had documentation of a recent body mass index or specialist allied health referral or feedback. Where comparison is possible, these rates are lower than the national figures.

Table 1. Percentage of patients having a test/measurement performed within the recommended interval

Clinical parameter	RACGP 2003–2004 recommended interval ¹²	Midwest 2005 (n=253)	NDDP 2002 (n=3002)
	Months	% (95% CI)	%
HbA1c	6	70 (62.5–78.2)	76
Blood pressure	6	77 (67.4–86.8)	82
Body mass index*	6	42 (28.4–55.4)	69
Eye referral	24	46 (35.9–55.8)	NA
Eye feedback*	24	50 (40.8–58.9)	60
Feet referral	6	17 (8.8–26.0)	NA
Feet feedback*	6	10 (0.8–19.0)	67
Lipids	12	63 (52.0–73.7)	65

* Significantly different proportion of patients having a test/measurement performed within the recommended interval between the midwest and NDDP

Clinical outcomes

Most of the clinical outcomes of patients in the midwest are similar to national levels, although the mean for HbA1c in the midwest is significantly higher. At least half the patients are outside the RACGP target for all the clinical outcomes, except for high density lipoprotein (HDL) cholesterol and triglycerides (*Table 2*).

Discussion

This study is the first audit of diabetes management representative of a rural region. Strong support from the division of local practice and local GPs enhanced the quality of the data. We had a high response rate from the randomly selected GPs and access to all medical records, not just the electronic registers.

The study also had a number of limitations. It was beyond the scope of this project to independently assess the completeness of the general practice diabetes registers. Although this may have resulted in a biased sample of patients who were regularly managed by their GPs, it does reflect the GPs' active diabetes patient load. Another limitation is that failure to document risk factors in medical records does not necessarily mean that the GPs were unaware of them nor provided appropriate education. A similar qualification applies to referrals, which may have been given verbally or in writing to the patient but not included in the records. Once again it was beyond the scope of this project to check if a lack of documentation did reflect a true lack of referrals.

The results showed that the quality of care by midwest GPs and the health outcomes of their patients is similar to national levels, but RACGP guidelines are not universally met. Using the PDSA cycle, these results were used to 'study' what change was needed to improve the quality of care by GPs, with the potential to also improve health outcomes of patients. Based on the 'act' stage of the PDSA cycle, three interventions have been developed with the participating GPs and allied health professionals. First, individual reports were provided to participating GPs and the overall results were disseminated at a routine GP education meeting. Second, standard referral and feedback forms were developed to increase effective communication between GPs and allied health service providers. The third intervention involved the establishment of a division based practice support team to assist practice staff to establish register and recall systems and to employ care plans as standard practice in the management of chronic disease.

Rural areas experience limited opportunities for primary care research and this study was made possible through a community-university research partnership.¹⁶ This study has followed the PDSA cycle and used practical research to develop evidence based interventions.¹⁰ In order to continue the PDSA cycle, a University of Western Australia 2006 research grant has been obtained to complete a repeat audit which will 'study' the effectiveness of the interventions described above. Results from the repeat audit may be used to 'act' upon

Table 2. Means (and confidence intervals) of patient clinical outcomes

Clinical outcomes	RACGP 2003–2004 target ¹²	Within target	Midwest 2005		NDDP 2002	
			N	Mean (95% CI)	N	Mean (95% CI)
HbA1c	≤7%	46%	242	7.54 (7.31–7.78)	1757	7.24 (7.18–7.29)
Body mass index	≤25 kg/m ²	17%	153	31.5 (30.3–32.7)	1876	30.4 (30.2–30.7)
Systolic BP	<130 mmHg	36%	241	134.6 (131.2–138.1)	1939	136.2 (135.5–136.9)
Diastolic BP	<85 mmHg	42%	241	77.9 (75.5–80.3)	1939	78.2 (77.9–77.9)
Total cholesterol	<4.0 mmol/L	18%	217	4.92 (4.76–5.08)	1350	4.85 (4.80–4.89)
HDL cholesterol	≥1.0 mmol/L	74%	191	1.22 (1.13–1.30)	1314	1.25 (1.23–1.27)
LDL cholesterol	<2.0 mmol/L	17%	186	2.87 (2.70–3.04)	707	2.74 (2.70–2.79)
Triglycerides	<2.0 mmol/L	63%	213	1.96 (1.75–2.17)	1273	2.06 (2.00–2.13)

permanently implementing, abandoning or changing these interventions. However, it may be unrealistic to expect an improvement in quality of care and health outcomes within the first PDSA cycle. The PDSA is a continuous cycle and results from the repeat audit may give further impetus to complete this process again.

Implications for general practice

- Strong partnerships at a local level can produce quality applied research done locally based on a PDSA model.
- In response to the PDSA model, a number of interventions to improve information transfer and chronic disease practice support systems have been implemented.
- A second audit has been funded to see if these interventions will result in improved quality of care and patient health outcomes.

Conflict of interest: none declared.

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