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## ORIGINAL RESEARCH

# The impact of point of care testing on diabetes services along Victoria's Mallee Track: Results of a community-based diabetes risk assessment and management program

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## ABSTRACT

**Introduction:** In the State of Victoria in Australia, diabetes is considered one of the top 10 health problems for people living in the rural Mallee Track region (which is centred on the town of Ouyen and extends west to the border with South Australia). A project entitled 'Diabetes Management Along the Mallee Track' was conducted through a Rural Chronic Disease Initiative (RCDI) program grant from the Australian Government's Department of Health and Ageing, Canberra, with the aim of improving the delivery of diabetes services in this region. The project's aims were achieved through the implementation of a community risk assessment program and the establishment of an integrated, multidisciplinary 'one-stop' service for the management of people with diabetes. The use of on-site point-of-care (POC) pathology testing equipment was the key component of both arms of the project.

**Methods:** Community risk assessment sessions were held in seven towns across the Mallee Track region using a local settings approach. Risk assessment included POC pathology testing for glucose and lipids, as well as blood pressure, age, personal and family history of diabetes, smoking status, and self-assessed weight and level of exercise. The multidisciplinary 'one-stop' service for the management of people with diabetes involved having a single appointment with their local GP, during which time they met the local diabetes educator and podiatrist as well as the GP, and on-site POC testing (POCT) performed for haemoglobin A1c (HbA1c),



urine albumin : creatinine ratio (ACR), lipids and glucose. A written survey was conducted among patients with diabetes, local GPs and local health professionals to assess the level of satisfaction with the project and the use of POCT, and to assist policy development for the future planning and development of diabetes services along the Mallee Track region.

**Results:** Risk assessment: 320 adults were assessed for their risk of diabetes during community sessions (representing approximately 20% of the adult population of the region). Two-thirds of people tested had equivocal random blood glucose levels (5.1-11.0 mmol/L), while hypertension and high cholesterol were found in more than one-third. Management of established diabetes: 49 people with known, established diabetes were initially entered into a Central Diabetes Register (with 5 more joining the register since). These diabetes patients ( $n = 54$ ) have now been monitored by POCT for a mean of 10 months (range 3-18 months). Since the introduction of the 'one-stop shop', the percentage of persons achieving optimal glycaemic control (HbA1c <7%) has increased by 30% (from 33% to 63%), the percentage achieving controlled glycaemia (HbA1c < 8%) has increased by 32% (59% to 91%), while the number exhibiting poor control has reduced by 7% (13% to 6%). The mean HbA1c has fallen from 7.6% at the commencement of the program to 7.1% ( $p = 0.03$ , paired  $t$ -test). Falls in cholesterol and blood pressure were also observed. Satisfaction with new management services for diabetes: 36 patients with diabetes (73% of all known diabetes patients in the region at the time) completed satisfaction questionnaires. There was overwhelming support within this group for the use of POCT as part of their management, because it was convenient, encouraged self-management and enhanced doctor-patient relationships. The proportion of patients with diabetes who were satisfied/very satisfied with the available diabetes services was significantly greater following the introduction of the project (before:  $n = 18$  (64%), after:  $n = 29$  (91%),  $\chi^2 = 6.10$ ,  $p = 0.01$ ). Doctors agreed that the immediate availability of POCT results at the time of consultation was convenient for them, contributed positively to patient compliance and improved their relationship with the patient. Health professionals felt confident in using the POC analysers and believed the program had raised community awareness about diabetes and enhanced community ownership.

**Conclusion:** Point-of-care pathology testing has enabled the introduction of a community-friendly risk assessment program for diabetes and provided a convenient and rapid service for monitoring the control of diabetes in people with established disease in the Victorian Mallee Track region. The number of diabetes patients accessing diabetes services has more than doubled since the introduction of the program. All community and health professional groups surveyed agreed that the POC model delivered as part of this project should be available to all people throughout the Mallee Track region. The model, although conducted in a small rural community, has the potential to form a suitable template for the broader introduction of POCT services for diabetes in rural and remote communities across Australia. As an independent measure of the success of the program, the Australian Government's Department of Health and Ageing selected the Diabetes Management Along the Mallee Track project as one of three demonstration projects from the RCDI grants for showcasing to all rural health services in Australia through the production of an education resource called 'Building Healthy Communities'.

**Key words:** Australia, diabetes, Mallee Track, Point-of-Care Testing

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## Introduction

In 1996, the Federal, State and Territory Governments of Australia identified diabetes mellitus as one of six National Health Priority Areas. The Australian Diabetes, Obesity and Lifestyle Study, which arose from the National Diabetes

Strategy and Implementation Plan<sup>1</sup>, determined that approximately 940 000 Australians over the age of 25 years had diabetes<sup>2</sup>. Furthermore, the prevalence of diabetes in Australian adults had trebled since 1981 and for every known case of diabetes there was one undiagnosed case<sup>2</sup>.



Recently, in the Australian state of Victoria, diabetes was recognised as one of the top 10 health problems for people of all ages in the rural 'Mallee Track' region (centred on the country town of Ouyen, approximately 400 km north-west of Melbourne, the capital of Victoria [Fig. 1])<sup>3</sup>. In an attempt to improve diabetes services in this region, the Mallee Track Health & Community Service (MTH&CS), based in Ouyen, undertook a project entitled 'Diabetes Management Along the Mallee Track'. This project was funded by a Rural Chronic Disease Initiative (RCDI) program grant from the Australian Government's Department Health and Ageing, Canberra, and was based in part on the MAN Model of Health Promotion, piloted and developed by Centre for Advancement of Men's Health across rural Victoria<sup>4</sup>.

The primary aims of the Diabetes Management Along the Mallee Track project were:

1. To identify people at risk for diabetes and raise the level of awareness about diabetes in the general community, through the delivery of community-based risk assessment programs across the region.
2. To provide improved services for people with established diabetes across the region, through the establishment of an integrated, multidisciplinary, 'one-stop' service for the management of diabetes.

The novel use of point-of-care (POC) pathology testing was a key component of both the risk assessment and management arms of the project. POC testing (POCT) is a major growth area within community and hospital medicine in Australia, and is soon to be trialled within the general practice sector in Australia<sup>5</sup>. POCT provides the opportunity for pathology tests to be performed on-site in the community by a trained health professional, with results available within 10-15 min.

This article describes the use of POCT for the risk assessment and management arms of the Mallee Track program (focussing particularly on the latter), and reports the level of satisfaction among community members with diabetes, their doctors and allied health professionals with the new POCT services provided as part of this project. An initial assessment

on clinical outcome measures for patients with diabetes, one-year post-introduction of the program, is made.

## Methods

### *Description of the Mallee Track Region*

The Mallee Track region of north-west Victoria is classified as a remote area, according to the Australian Government's rural and remote areas (RRMA) classification system<sup>6</sup>. It is more than 350 km from the nearest capital cities (Adelaide and Melbourne) and 100 km from the nearest rural centre, Mildura. Agriculture (wheat and barley) and sheep farming are the region's main local industries. There are three main towns in the region, Ouyen, Underbool and Murrayville, Ouyen having the largest population of approximately 1150 people (690 adults). The region's total population is approximately 2800 (1680 adults).

### *Description of diabetes services prior to the introduction of the program*

Prior to the introduction of the program, diabetes services for patients were disjointed and uncoordinated. Local services provided by two GPs were used sporadically by only 15-20 patients with diabetes. Patients had to travel considerable distances (100 km) to obtain selected specialist services (such as diabetes education) and had to wait several days for pathology results. On average each patient had one haemoglobin A1c (HbA1c) measurement performed annually to assess his or her diabetes control.

### *Partnerships*

The Diabetes Management Along the Mallee Track project was established and directed by the Special Community Health Projects Team from MTH&CS, in partnership with local GPs and MTH&CS Allied Health and community health nurses. A diabetes educator visited the Mallee Track Medical Centre monthly through a partnership with the Mallee



Division of General Practice. A podiatrist was also engaged locally. The Community Point-of-Care Services unit from the Flinders University Rural Clinical School supported the project with POC technology, training and competency certification for local POCT operators, quality management procedures, data management and assistance in designing community surveys. A local Advisory Committee was formed to provide direction and guidance to the program; the committee included local community representation from the Ouyen Diabetes Support Group.

### *Community-based risk assessment programs*

Members of the Mallee Track community were invited to participate in community risk assessment sessions held in seven towns across the region: Ouyen, Murrayville, Walpeup, Underbool, Patchewollock, Speed and Manangatang. Participation in risk assessments was voluntary and opportunistic. Risk assessments were conducted in a local community 'settings' approach; for example, using the local Community Fire Authority (CFA), local schools and colleges, and community field days as venues for risk assessment sessions, as well as targeting specific community groups such as the local walking group and the local men's tennis club. Diabetes risk factor assessment was based on current Australian best practice guidelines<sup>7-11</sup>, and included random capillary blood glucose and total cholesterol (measured by fingerprick POCT), blood pressure, age, personal and family history of diabetes, smoking status, and self-assessed weight and level of exercise.

### *Management of people with established diabetes*

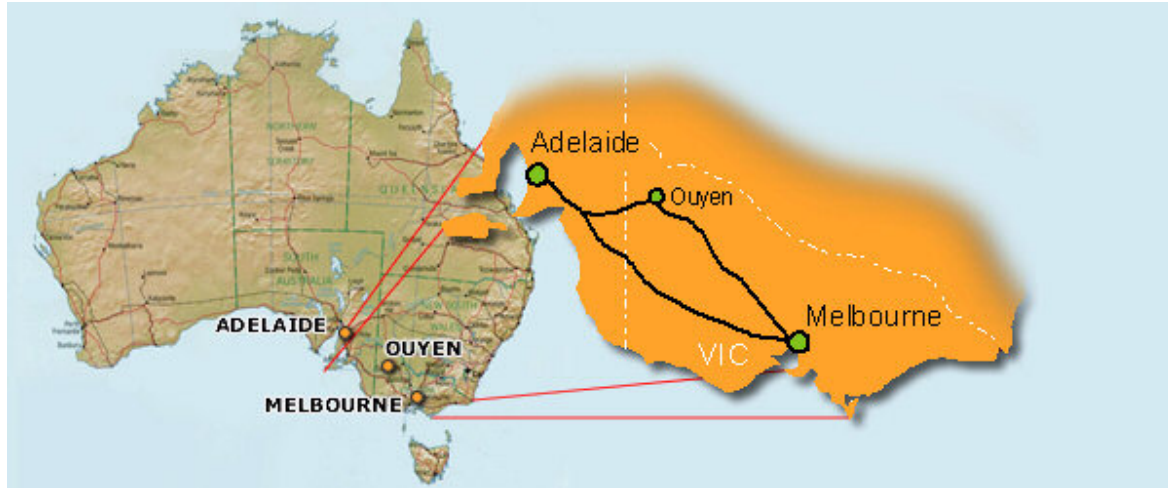
Community members with established diabetes were invited to participate in a new multidisciplinary service, which involved a single appointment with their local GP. This appointment also included meeting the diabetes educator and podiatrist and on-site POC testing for HbA1c, urine albumin : creatinine ratio (ACR), blood lipids and glucose performed by the Special Community Health Projects team nurse. Having POCT results available within the single consultation enabled the GP to enact patient management

and/or change treatment during the consultation, without the need for the patient to return for a follow-up visit. This integrated approach was designed to provide a more accessible and convenient service for people with diabetes, and to improve patient motivation to self-manage their diabetes. It also overcame the need for patients to travel long distances to access specialist services. A local register of all participants in this service was established, including POCT results conducted at the commencement of the program (0 months) and at every subsequent visit to their local GP. This enabled future tracking of diabetes control and an assessment of clinical outcomes post introduction of the new service.

### *POCT instruments*

The Bayer DCA 2000 (Bayer Australia, Melbourne, Vic, Australia) and the Cholestech LDX Lipid Analyser (Point of Care Diagnostics, Sydney, NSW, Australia) were used for POCT. The Bayer DCA 2000 measured HbA1c on a fingerprick (1  $\mu$ L) of whole blood in 6 min. HbA1c is a well-established biochemical marker that provides a measure of a person's diabetes control over the preceding 3 months<sup>1,2,7</sup>. The DCA 2000 is currently used for POC HbA1c monitoring for people with diabetes in 60 urban, rural and remote Australian Aboriginal medical services, through the 'QAAMS' program (Quality Assurance for Aboriginal Medical Services)<sup>12-14</sup>. The DCA 2000 has proven safe, analytically reliable and robust, and clinically and culturally effective in this setting<sup>12-15</sup>.

The DCA 2000 was also used to measure albumin:creatinine ratio (ACR) on 40  $\mu$ L of urine in 7 min. Urine ACR is a key biochemical marker for the early detection of microalbuminuria and for monitoring the progression of diabetic nephropathy<sup>16</sup>. The instrument is used in the national "QAAMS" program for point-of-care ACR testing, its analytical performance has been validated against equivalent laboratory-based methods, and it is a useful test for the detection and management of chronic disease in a rural community setting<sup>14,17-19</sup>.



**Figure 1: Location of Ouyen, the central town in the Mallee Track region of Victoria.**

The Cholestech LDX machine measured total cholesterol, triglyceride, HDL-cholesterol, LDL-cholesterol (calculated) and glucose on a fingerprick (35  $\mu$ L) of whole blood in 5 min. The analytical performance of the Cholestech machine has been validated in the laboratory and in the rural community setting<sup>20,21</sup>.

#### ***Quality management of the POCT equipment***

The Flinders' Community Point-of-Care Services unit implemented an internal quality management program to monitor the analytical performance of the POC instruments in the field. Local operators of the POC equipment were required to test a commercially available quality control (QC) material for each POC test and on each POC instrument every time a new reagent kit was opened (containing 10 testing cartridges).

#### ***Questionnaires to assess project outcomes***

With assistance from the Flinders University Centre for Epidemiology and Biostatistics, a questionnaire was developed to assess participants' views on the introduction of

POC services and to assist policy development for the future planning and delivery of diabetes services along the Mallee Track region. The questionnaire design was based on the 5-point Likert scale<sup>22</sup>, with respondents recording their levels of agreement or disagreement with statements posed. Participants were given equal opportunity to agree or disagree with each statement. The questionnaire for people with established diabetes assessed their level of satisfaction with the POC testing services provided through the project, and was administered at the completion of the project (that is, after 12 months). The President of the Ouyen Diabetes Support Group assisted with the development of this questionnaire. The Manager of the MTH&CS Special Projects team explained the aims and objectives of the questionnaire to people with diabetes at a monthly meeting of the Ouyen Diabetes Support Group. Following this meeting each person filled out a questionnaire in his/her own time and at his/her convenience. Completed questionnaires were returned in a sealed envelope to the Manager of the MTH&CS Special Projects team within 2 weeks. Two further surveys were implemented. Three local GPs were surveyed to assess their satisfaction with the new POC testing services for diabetes management, and the three health professionals responsible



for conducting POC testing also completed a questionnaire to gain information about their acceptance of the POC technology used during the project.

## *Statistical methods*

The demographics and POC results of the participants who underwent community-based risk assessment were examined. Continuous, normally distributed variables were expressed as means and standard deviations (SD), and variables with skewed distributions were reported as medians and inter-quartile ranges (IQR). Categorical variables were reported as frequency and percentage. Comparisons were made between the POC measurements by gender, using Mann-Whitney *U*-tests. The prevalence of risk factors in community participants was reported, and their relationship with age was examined using  $\chi^2$  test for trend. For participants with established diabetes, group mean (SD) POC measurements were calculated at the program commencement and at their most recent visit to their local GP.

The results of the satisfaction questionnaires were reported as the number (and percentage) of respondents who agreed, were neutral, or disagreed with the statements presented in the questionnaires. Comparisons were made between the satisfaction with diabetes services provided prior to, and following the program implementation, using a  $\chi^2$  test.

## Results

### *Risk assessment*

Three hundred and twenty people underwent risk assessment for diabetes during community sessions along the Mallee Track, over the study period. The mean age of those assessed was 50.3 years (SD 14.7, range 16-86 years). POC measurements collected at community risk assessment are described (Table 1). Male participants had higher random

blood glucose and higher systolic and diastolic blood pressures, when compared with female participants (Mann-Whitney *U*-test,  $p < 0.05$ ).

Risk factors for diabetes among those assessed in the Mallee Track community were common, with over two-thirds ( $n = 210$ ) having an equivocal capillary blood glucose (5.1-11.0 mmol/L) (Figure 2). 38% ( $n = 116$ ) of those tested had abnormal lipids (total cholesterol  $\geq 5.5$  mmol/L), while 44% ( $n = 137$ ) had hypertension (systolic blood pressure  $\geq 140$  mmHg or diastolic blood pressure  $\geq 90$  mmHg). Smoking rates were low (13%,  $n = 37$ ). These prevalence rates for people in the Mallee Track region are lower than the national average<sup>2</sup> for lipids (38% vs 51% respectively) and smoking (13% vs 16%) but higher for hypertension (44% vs 29%). The latter finding is attributed to a very high rate of hypertension in males in the region (54% vs 31% nationally). A positive trend was identified between hypertension and increasing age ( $\chi^2 = 24.5$ ,  $p < 0.001$ ), and between abnormal lipids and increasing age ( $\chi^2 = 12.8$ ,  $p = 0.03$ ). The prevalence of diabetes (random blood glucose  $\geq 11.1$  mmol/L) in those assessed was not associated with age ( $\chi^2 = 11.2$ ,  $p = 0.35$ ), however the number of persons assessed in the lower age groups were small. Three new cases of diabetes were identified as a result of the risk assessments conducted.

### *Management of established diabetes*

Forty-nine persons with established diabetes commenced POC pathology testing at their local general practice across the first 12 months of the program, with another five people with diabetes joining this group over the following 6 months. A local diabetes register was established and all POCT results were entered into this register following each GP visit. The MTH&CS and the Flinders' Community Point-of-Care Services unit jointly maintain the register, which is electronically updated and available to local general practitioners.



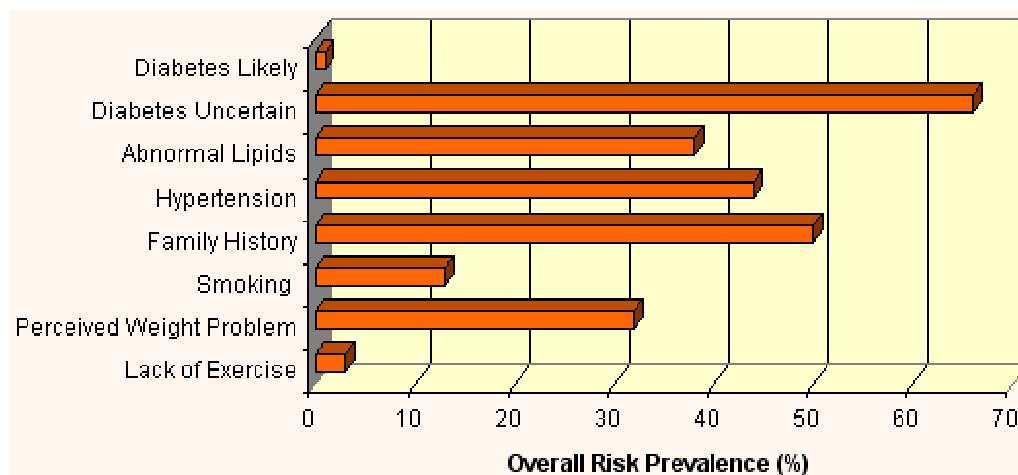
**Table 1: Baseline characteristics of POC measurements conducted during the community risk assessment program**

POC Test	All		Males		Females		p Value*
	Median	IQR	Median	IQR	Median	IQR	
Random blood glucose	5.40	1.45	5.50	1.40	5.30	1.40	0.028
Total cholesterol	5.28	1.02	5.31	1.14	5.20	0.92	0.060
Systolic BP	133	27	140	23	130	20	<0.0001
Diastolic BP	80	16	83	16	78	14	0.0002

POC, Point of care; IQR, interquartile range; BP, blood pressure.

\*Comparisons were made between males and females, using a Mann-Whitney *U* test.

Random blood glucose mmol/L (*n* = 319; 160 males), total cholesterol mmol/L (*n* = 305; 156 males), systolic blood pressure mmHg (*n* = 310, 156 males) and diastolic blood pressure mmHg (*n* = 309, 156 males).



**Figure 2: Prevalence of risk factors\* for diabetes in the Mallee Track region. \*Categorisation of key risk factors: diabetes unlikely, capillary blood glucose  $\leq$  5.0 mmol/L; diabetes uncertain, capillary blood glucose 5.1-11.0 mmol/L; diabetes likely, capillary blood glucose  $\geq$  11.0 mmol/L; abnormal lipids, total cholesterol  $\geq$  5.5 mmol/L; hypertension, sBP  $\geq$  140 mmHg or dBP  $\geq$  90 mmHg.**

These diabetes patients (*n* = 54) have now been monitored by POCT for a mean of 10 months (range 3-18 months). A total of 162 POCT HbA1c tests, 91 ACR tests, and 132 lipids tests have been performed since POCT commenced. The percentage of diabetes patients achieving optimal glycaemic control (HbA1c <7%) increased from 33% (start of the program) to 63% (POCT measurement at their most recent visit to the GP). The percentage achieving controlled

glycaemia (HbA1c < 8%) increased from 59% to 91%, while the number exhibiting poor control fell from 13% to 6% (Figure 3). Since the commencement of POCT, the mean HbA1c, cholesterol, and systolic blood pressure of the diabetes group has fallen significantly (paired *t*-test) by 0.5%, 0.36 mmol/L and 9 mmHg as measured by POCT at their most recent visit to the GP (Table 2). Diastolic blood pressure had fallen by 5 mmHg.

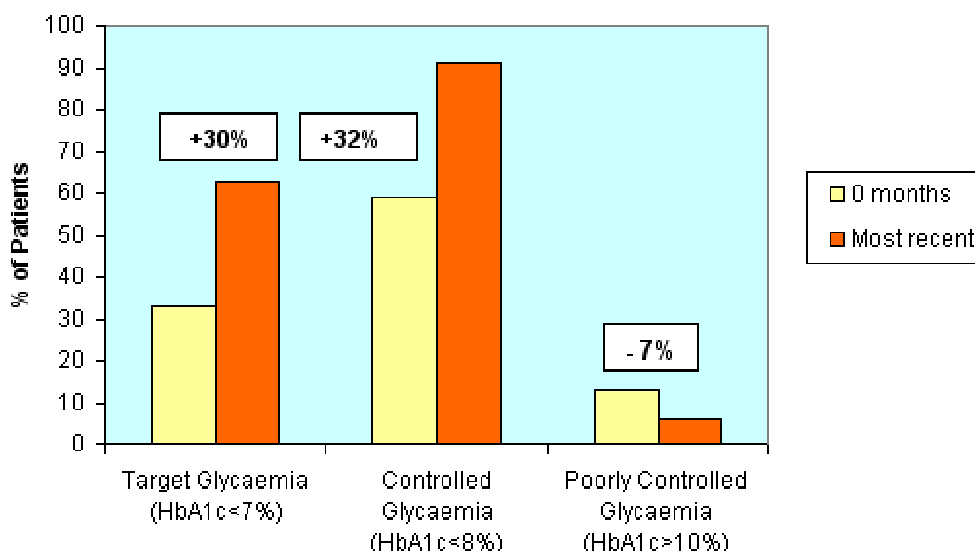




**Table 2: Mean (SD) of POCT measurements in the Diabetes Management group at the commencement of the program (0 months) and at their most recent visit to the GP (most recent)**

Test	Units	Mean (SD)		n	p Value*
		0 Months	Most Recent		
HbA1c	%	7.6 (1.6)	7.1 (1.4)	54	0.03
Cholesterol	mmol/L	4.64 (1.0)	4.28 (0.9)	52	0.01
Systolic blood pressure	mmHg	143 (21)	134 (14)	52	0.004
Diastolic blood pressure	mmHg	81(21)	76 (10)	52	0.09

HbA1c, haemoglobin A1c  
*p*<0.05 represents significant change



**Figure 3: Improvement in glycaemic control among diabetes patients, showing an increase in percentage of diabetes patients attaining glycaemic targets and a decrease in the percentage of patients exhibiting poor control, as measured by POCT at the commencement of the program (0 months) and at their most recent visit to the GP.**

### Quality management of POC instruments

Twenty-two Bayer HbA1c QC tests, 17 Bayer Urine ACR QC tests and 44 Cholestech lipid QC tests were conducted during the project period (Table 3). The precision of internal quality control testing for HbA1c, urine ACR, urine albumin

and urine creatinine met the desirable analytical performance specifications recommended by the Australian Government's 'Interim Standards for Point of Care Testing in General Practice'<sup>23</sup>. For total cholesterol, the precision achieved for quality control testing was very close to the recommended analytical goal.



**Table 3: Precision achieved for internal quality control testing on POC instruments**

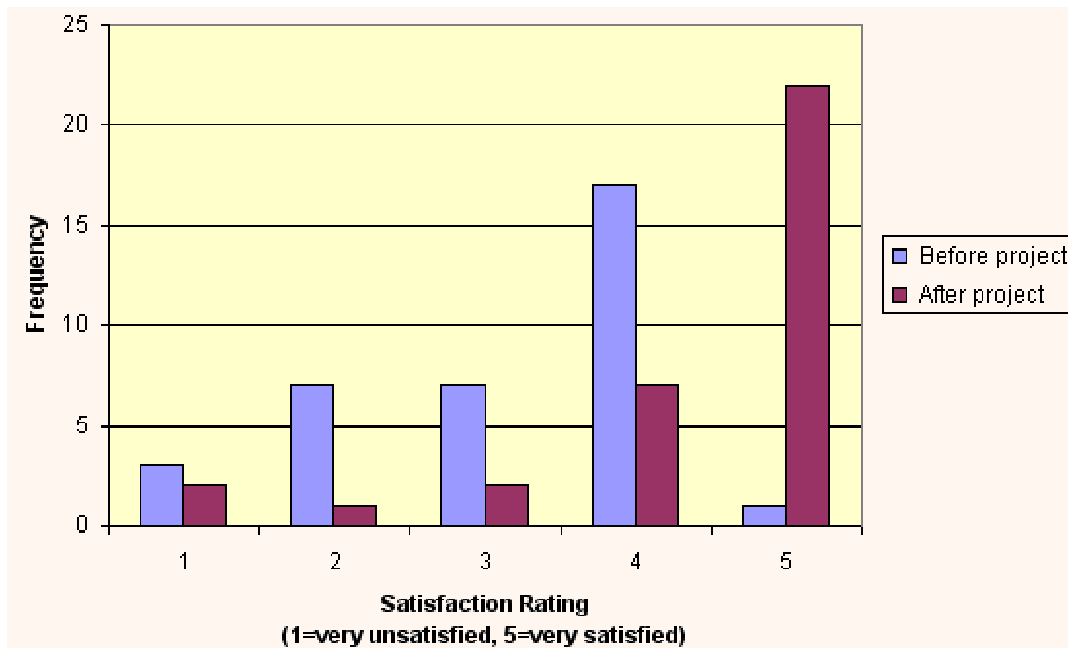
Test	Concentration/ level	Precision (%)	Goal (%)
HbA1c (%)	5.5	2.7	4
	11.0	4.0	
Urine ACR (mg/mmol)	3.6	6.1	12
	6.1	4.1	
Urine Albumin (mg/L)	33.0	8.0	10
	211.0	5.2	
Urine Creatinine (mmol/L)	8.8	3.8	6
	35.4	2.2	
Cholesterol (mmol/L)	4.6	6.6	5
	6.8	6.0	

ACR, Albumin: creatinine ratio; HbA1c, haemoglobin A1c.

**Table 4: Results of questionnaire on POC testing for people with established diabetes**

Item	Disagree		Neutral		Agree	
	n	%	n	%	n	%
Convenience						
Satisfied with POC result immediately available	0	-	1	3	35	97
Advantage not having to return to clinic for result	0	-	1	3	35	97
Personal issues						
Fingerprick less stressful than venepuncture	0	-	1	3	35	97
Getting immediate result less stressful	0	-	1	3	35	97
Confident in accuracy of POC result	0	-	1	3	34	97
POC acceptable alternative to laboratory testing	0	-	0	-	35	100
Motivated to look after diabetes because of POC	0	-	2	6	31	94
Happy to return for regular POC testing	0	-	1	3	32	97
Doctor-patient Issues						
Visit more worthwhile with POC results available	1	3	1	3	33	94
Being able to speak about result at visit positive	0	-	2	6	31	94
POC has helped relationship with doctor	0	-	1	3	31	97
Doctor able to manage diabetes better	0	-	1	3	32	97
Specific questions						
Resources and questionnaires easy to use	1	3	1	3	33	94
Should POC program continue	0	-	0	-	35	100
Should POC testing be available to all diabetics in Mallee	0	-	0	-	36	100
Is one-stop diabetes service an improvement	0	-	3	9	31	91

POC, Point of care.



**Figure 4: Comparison of the overall level of satisfaction with diabetes services before and after the Diabetes Management Along the Mallee Track project.**

### *Satisfaction with New Management Services for Diabetes*

Satisfaction questionnaires were received from 36 people with established diabetes, two-thirds ( $n = 28$ ) of whom were aged 55 years or older. This number of respondents represented 73% (36/49) of all persons in the Mallee Track region known to have diabetes at the time the questionnaires were implemented. The majority of respondents (> 90%) reported a high level of satisfaction with the convenience of the program, personal issues, doctor-patient issues and the program overall (Table 4). There was unanimous agreement among respondents that they would like to see POC testing continue for their own diabetes management, and that they wished POC testing to be available to all people with diabetes across the Mallee Track region.

The proportion of respondents who were satisfied/very satisfied with the available diabetes services was significantly greater following the introduction of the project (before:

$n = 18$  [64%], after:  $n = 29$  [91%],  $\chi^2 = 6.10$ ,  $p = 0.01$ ) (Figure 4).

Three local GPs completed a satisfaction questionnaire. All agreed that the availability of POCT during consultations was convenient and the opportunity to discuss POC results immediately was advantageous. They had confidence in the accuracy and reliability of the POC result and believed it was an acceptable alternative to laboratory testing. They also agreed that immediate availability of the POC result contributed positively to overall patient care and patient compliance, as well as improving their rapport and relationship with the client. All three strongly agreed that the POCT component of the program made a positive contribution to the management of diabetes within their service.

Three community health nurses responsible for conducting POCT completed a satisfaction questionnaire. All agreed that



the education, training and resources provided by the Flinders' Community Point-of-Care Services unit were useful and appropriate. They had confidence in the accuracy and reliability of the POC results and understood the need to perform quality control testing. Among the three respondents, there was general agreement that patients in the community were happy with POCT services, the program had provided a focus for raising community awareness about diabetes and enhanced the sense of community ownership of the project.

## Discussion

The emergence of POC pathology testing throughout the world has paralleled significant advances in medical technology, changes in healthcare delivery, with a more patient-orientated approach to care and an increasing demand for improved turnaround of pathology results<sup>24</sup>. The Australian Federal Government recently commissioned a major review of the role and value of POCT in the general practice environment<sup>25</sup>. This review concluded that only very limited information is currently available on the efficacy of POCT in general practice in Australia<sup>26</sup> but that rural and remote practices could potentially be the greatest beneficiaries of POCT.

In the rural-based Diabetes Management Along the Mallee Track Project, POCT was introduced for both risk assessment and the management of diabetes. The use of the DCA 2000 and Cholestech LDX POC technology for this purpose has proven safe, robust and analytically reliable in rural community hands. As part of the risk assessment sessions, POCT contributed to a greater community understanding of diabetes and its associated risk factors and provided an effective and rapid means for on-going surveillance of community risk. The coordinated, multidisciplinary 'one-stop' approach to diabetes management, combining access to GP and specialist support services with on-site POCT and immediate result availability, has been well supported by the region's diabetes patients. There are now more than two-and-a-half times more patients

accessing this new service and receiving closer monitoring of their diabetes control compared to the number utilising the previous diabetes service. The number of patients achieving glycaemic targets has increased greatly, while improvements in diabetes, lipid and blood pressure control have also occurred. Patients with diabetes have expressed a significantly higher level of satisfaction with the new diabetes service, although there is potential for retrospective bias. They were unanimous that they wanted POCT to continue for their personal diabetes management and that POCT should be available for all people with diabetes in the region. Local doctors and health professionals conducting POCT were confident with this mode of health service delivery.

Two key challenges for the program are: (i) the on-going maintenance of the local diabetes register and the commitment to continue performing key POC pathology tests at the frequency recommended for best practice management; and (ii) attention to the care and follow up of people identified at greatest risk for diabetes via the community risk assessment sessions.

The Diabetes Management Along the Mallee Track project was initially selected as one of 19 innovative rural projects funded through the Australian Government's RCDI program. At the conclusion of this RCDI program, the Government selected the Diabetes Management Along the Mallee Track project as one of three demonstration projects for showcasing to all rural and remote health services in Australia through the production of an education resource called Building Healthy Communities<sup>27</sup>. This resource features a DVD and video on how the Diabetes Management Along the Mallee Track project is conducted on a day-to-day basis and aims to provide a framework to assist rural communities throughout Australia to conduct more effective community projects.

While acknowledging the population sample size in this project was relatively small and a larger study would be needed to broaden the generalisability of our findings, the Mallee Track model, with its associated POCT services, has considerable potential to be tailored locally and applied to many similar rural and remote health services in Australia,



where community will and health professional commitment can work together for the common cause of reducing the prevalence and burden of diabetes.

## Acknowledgements

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## APPENDIX I

Questionnaire administered to 36 patients with diabetes to assess their level of satisfaction with their diabetes service after the introduction of the program.

**DIABETES MANAGEMENT ACROSS THE MALLEE TRACK**  
**Federally funded by the Department of Health and Ageing**  
**Research and Evaluation conducted by the**  
**Community Point-of-Care Services unit, Flinders University Rural Clinical School**

### Questionnaire on Point-of-Care Testing For People with Diabetes

The 'Diabetes Management Along the Mallee Track' Special Projects Team in association with the Community Point-of-Care Services unit is very interested to learn about your level of satisfaction with the point-of-care testing service and the point-of-care equipment (Cholestech and DCA 2000) used in this program for your diabetes management.

**As a person using our services, your experiences are very important to us and your feedback is greatly valued. The information gathered from this survey will assist in planning for future point-of-care testing services across the Mallee Track region. Your responses will be regarded as strictly confidential.**

Thank you for your time in filling out this questionnaire.

#### *Section 1. General Questions*

Could you circle your response to the following statements in terms of **how strongly you agree or disagree with the statement**:

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree:

#### **Regarding Convenience**

1. I am satisfied with having the point-of-care result immediately available to me.

Strongly Disagree    1       2       3       4       5       Strongly Agree

2. An advantage of point-of-care testing for me is that I do not have to come back to the clinic at a later date to get my laboratory result.

Strongly Disagree    1       2       3       4       5       Strongly Agree

#### **Personal Issues**

3. Having my blood test done by finger prick is less stressful than having blood taken from my arm.

Strongly Disagree    1       2       3       4       5       Strongly Agree

4. Getting my point-of-care result while I wait is less stressful than having to come back later on another day to find out my result.

Strongly Disagree    1       2       3       4       5       Strongly Agree

5. I have confidence in the accuracy of my point-of-care test result (as compared with the laboratory result).

Strongly Disagree    1       2       3       4       5       Strongly Agree

6. Point-of-care testing is acceptable to me as an alternative to conventional laboratory testing.

Strongly Disagree    1       2       3       4       5       Strongly Agree

7. I am more motivated about looking after my diabetes because of regular point-of-care testing.

Strongly Disagree    1       2       3       4       5       Strongly Agree



8. I am happy to come back regularly for further point-of-care testing as part of the management of my diabetes.

Strongly Disagree   1   2   3   4   5   Strongly Agree

## Doctor-Patient Issues

9. My visit to the doctor is more worthwhile because I have my point-of-care results with me when I see the doctor.

Strongly Disagree   1   2   3   4   5   Strongly Agree

10. Being able to speak to the doctor about my result in the same visit makes me more likely to manage my diabetes well (by medication/tablets or diet/exercise).

Strongly Disagree   1   2   3   4   5   Strongly Agree

11. Point-of-care testing has helped my relationship with my doctor.

Strongly Disagree   1   2   3   4   5   Strongly Agree

12. My doctor is better able to help me manage my diabetes with the point-of-care results and the help of the Diabetes Risk Assessment Team?

Strongly Disagree   1   2   3   4   5   Strongly Agree

## Section 2. Specific Questions

Please make comments on whether point-of-care testing has helped you look after your diabetes.

Please *tick* your response to the following questions:

1. Would you like Point-of-Care Testing program to continue to be used for the management of your diabetes?

Yes                      No                      Don't know

2. Would you like to see Point-of-care Testing available to all people with diabetes across the Mallee Track region?

Yes                      No                      Don't know

3. Is the 'one-stop' diabetes service, incorporating point-of-care testing and visits to the GP, Diabetes Educator and Podiatrist, now better than the diabetes service that were offered prior to this project.

Yes                      No                      Don't know

4. PRIOR to the introduction of this project, what was your level of satisfaction with the diabetes services provided for you?

Very unsatisfied              Unsatisfied              Unsure              Satisfied              Very satisfied

5. AFTER to the introduction of this project, what is your level of satisfaction with the diabetes services provided for you?

Very unsatisfied              Unsatisfied              Unsure              Satisfied              Very satisfied

## Section 3. Demographics

Please complete the following information by ticking the relevant box.

**Gender:**              Male              Female

**Age Group:**              15-24              25-34              35-44              45-54              55-64              65+

My **Home Town** in Mallee Track region is:

Ouyen              Murrayville              Underbool              Patchewollock              Other (please specify)

Please give your completed questionnaire to either Pauline Harrison, Diabetes Support Group, or Glennis Barnes, MTH&CS.

**If you have any queries or questions concerning the questionnaire, please contact Glennis or Bernard Denner on 50921111.**

**This questionnaire has been prepared by Community Point-of-Care Services unit, Flinders University Rural Clinical School and the Diabetes Management Across the Mallee Track Special Project Team.**

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