Point-of-care testing in the Aboriginal community

M. Shephard

Community Point-of-Care Centre, Renal Unit, Flinders Medical Centre, Bedford Park, South Australia

Keywords - point-of-care testing, chronic disease, Aboriginal health workers, laboratory concepts, quality assurance

Introduction

This article documents my experiences over the past five years working in the field of Aboriginal health. Since I began this work, I have had to transform myself from a medical scientist working behind the laboratory bench to a manager of people, projects, publications and finances.

During 1996, I left the relative comfort of that laboratory bench to join the Renal Unit at Flinders Medical Centre in the pursuit of becoming involved in Aboriginal health, an area for which I had a long-standing interest and empathy.

Throughout this article, I will focus on a number of fundamental differences between working in the Aboriginal health sector as opposed to the laboratory environment and the western or traditional view of health management.

The programs

The principle focus of our work is the application of Point-of-Care (POC) technology for the early detection and management of chronic diseases in the Aboriginal community setting. As a medical scientist specialising in clinical biochemistry, I intuitively felt that POC technology might be useful in the Aboriginal health sector. It was only when our work started in earnest that I realised just how exquisite was the fit. Apart from the well-acknowledged advantages of using POC technology such as portability and small sample size, there are other advantages specific, and directly applicable, to the Aboriginal health care setting.

Through appropriate training, Aboriginal health workers (Aboriginal people living in the community who are trained in primary health care) can perform POC tests on-site, thereby empowering them to take greater responsibility for the health of their own community members.

Immediate availability of results means that the client does not have to come back for a follow up visit. By conducting the tests on-site, ownership and control of
health information remain with the community, a factor crucial to the acceptance and success of indigenous health programs.

My training as a medical laboratory scientist also provided me with the knowledge and understanding that education, training and quality assurance must underpin the use of POC technology in the field. Having these three elements as our core or fundamental principles has been absolutely pivotal to the successful translation of our work into the community setting.

The chronic diseases diabetes, renal disease and cardiovascular disease account for a huge burden of morbidity and mortality among Aboriginal people. Some of the facts include:

- The mortality rate from diabetes amongst Aboriginal people is twelve to seventeen times that of non-Aboriginal people. Prevalence rates for diabetes in many Aboriginal communities are as high as 25-30%
- Renal disease has reached epidemic proportions in many parts of Australia, notably the Tiwi Islands where rates of end-stage renal disease (ESRD) are sixty times that of non-Aboriginal people and among the highest in the world
- Aboriginal people between the ages of 25 and 44 years suffer ten times more deaths due to coronary heart disease than non-Aboriginal people.

Early detection is the key to slowing (and in some cases preventing) the progression of these chronic diseases and the debilitating complications they cause.

Our work is thus centred on an area of significant disease burden for which there is a biochemical/technological application to address (in part) the problem. Within this framework, I have been fortunate to work on three major Aboriginal health programs as Program Manager.

The Umoona Kidney Project was a program for the early detection and prevention of renal disease in the 450-strong Umoona Aboriginal Community at Coober Pedy, 850kms north of Adelaide (Shephard et al 2003; Shephard and Allen 2001; Shephard et al 2000; Shephard 2000; Zeunert et al 2002). This project was a partnership between the Renal Units at Flinders Medical Centre and the Women’s and Children’s Hospital in Adelaide and the Umoona Tjutagku Health Service in Coober Pedy.

The Bayer DCA 2000 POC analyser was used to measure urine albumin:creatinine ratio (ACR) as the cornerstone of the renal screening program. The overall risk factor profile for chronic disease among the 158 adults screened was very disturbing, with 42% of people being hypertensive, a quarter having diabetes, and there was a large incipient pool of renal disease with 19% of people having microalbuminuria and 9% having macroalbuminuria. A strong correlation was observed between the degree of albuminuria and hypertension, obesity, glucose and age.

Thirty-five people were offered the ACE inhibitor medication Coversyl to reduce their blood pressure and stabilise their renal function and a significant improvement in both the cardiovascular and renal disease risk profile of this group has been maintained for over two years. The Umoona Kidney Project was handed over to the community as a self-sustainable program in December 2000.

The Quality Assurance in Aboriginal Medical Services Program (QAAMS) is an on-going national education, training and quality assurance program to support on-site HbA1c testing on the DCA 2000 for over 2300 Aboriginal people with diabetes (Shephard 2000; Brice et al 2001). In developing and managing this program, we have worked closely with the Office for Aboriginal and Torres Strait Islander Health (OATSIH), the National Aboriginal Community Controlled Health Organisation (NACCHO) and the RCQA Quality Assurance Programs Pty Ltd. Over 40 Aboriginal Community Controlled Health Services around Australia participate in the program, with their Aboriginal health workers conducting the HbA1c testing. The quality assurance arm of the program is believed to be a world-first for indigenous people.

The program has achieved a number of key milestones. For example, a participation rate of 86% has been maintained across the first three years of the program, despite a significant number of health worker staff changes. Aboriginal health workers, with culturally appropriate continuing education and training have been
able to achieve a standard of analytical performance for quality assurance testing that is consistently close, or equivalent, to that of trained laboratory personnel.

Through a directive of the Federal Health Minister, a Medicare rebate is now available for on-site HbA1c testing on the DCA 2000 conducted in participating Aboriginal Community Controlled Health Services. The rebate, conditional on continued participation in the QAAMS program, will ensure the long-term sustainability of the program.

Further Commonwealth funding has recently been secured to extend the program for another three years. In 2003, our first international site (from the Western Pacific) will join our QAAMS program for HbA1c.

The Point-of-Care in Aboriginal Hands program is a comprehensive screening and management program for diabetes, renal disease and cardiovascular disease (Jones et al 2002). The program is supported by the field use of three POC instruments – the DCA 2000 (for HbA1c and urine ACR measurements), the Cholestech LDX lipid analyser (Shephard and Tallis 2002) and the Abbott i-STAT analyser (used for creatinine measurements).

The program is currently being run at Port Lincoln, the Coorong and Riverland regions in South Australia and at Bega Garnbiriringu Aboriginal health service at Kalgoorlie in Western Australia. Early results show risk profiles similar to Umoona for diabetes, heart and renal disease.

Across the three programs, our work extends from remote inland desert communities to coastal communities at either end of the country.

In the long term our goals are to:

- Integrate all arms of the work together into a centre of excellence for education, training, quality management and evaluative field research using POC technology; a centre that has application and relevance to both Australian and international, rural and remote, indigenous and non-indigenous communities.

**People management**

One of the great pleasures of our work is the opportunity to work alongside (and learn from) so many different groups of other health professionals. For example, in the Umoona Kidney Project, at one point, there were 15 people from various disciplines across three sites to work with – these included the Chairman of the Board of the health service, the Director of the health service, its clinical nurse, four Aboriginal health workers, three renal specialists and a medical practitioner, two nutritionists, a medical student, two medical laboratory scientists, and two sports physiologists from the University of South Australia.

In the QAAMS program, we have been fortunate to have the opportunity to work with, in a one-on-one sense, nearly 100 Aboriginal health workers (and allied health professionals).

As mentioned earlier, with appropriate education and training, these health workers are consistently achieving an analytical performance standard for quality assurance testing that is close, or equivalent, to that of trained laboratory personnel.

Through this program, there has also been the opportunity to work closely with two medical laboratory scientists from the RCPA Quality Assurance Programs Pty Ltd, Janice Gill and Lloyd Penberthy.

With the Point-of-Care in Aboriginal Hands program, we have worked with rural doctors at each site, local nurses, diabetic educators and nutritionists and, collectively, more than 10 Aboriginal health workers.

There has also been the opportunity to develop and foster productive working relationships with government officials at State and Commonwealth levels (notably from within the Commonwealth Department of Health and Ageing), and industry representatives across Australia.
Finally there is my work team, comprising a medical laboratory scientist (Beryl Mazzachi), a research assistant and an administrative assistant, at our newly created home base, the Community Point-of-Care Centre at Flinders Medical Centre. Glen Allen, a senior medical laboratory scientist with the Renal Unit, also has significant input with the information technology and data management side of our work.

Working with all the above groups from so many diverse medical and health backgrounds, good communication skills and, more importantly, the ability to adapt those skills to suit the particular situation and environment have been crucial to ensure the ongoing (community-based and financial) viability of the work.

**Cultural skills and cultural awareness**

The fundamental principle in working on any Aboriginal health project is that the community involved must have a sense of ownership and control of the program. Partnerships based on equal standing, mutual trust and respect are paramount. Otherwise the project will be doomed to failure and will not get past first base. With the Umoona Kidney Project for example, we spent six months liaising with the community, listening to the community’s aspirations and developing project aims and objectives before the project commenced in earnest. This proved crucial in both getting the project off the ground and maintaining its success. On the first day we commenced renal screening, seventy community members voluntarily presented at the clinic. The Director of the health service said she had never before seen such a positive response to a community project – all because the community were fully informed and understood what the project was about, and they knew what the program meant for them individually and collectively.

There is a real challenge for the non-Aboriginal health professional to translate complex scientific, medical or laboratory concepts into culturally appropriate images as transfer of information in Aboriginal culture is based on the spoken word and visual images. Using some examples from our work, the relationship between HbA1c and diabetic control has been portrayed by using spoonfuls and wheelbarrows of sugar. HbA1c has been described simply as sugar that is attached to haemoglobin in the red cells of the body. In discussing the concept of accuracy and precision, the analogy of an AFL footballer having kicks for goal has been used.

In another example, from the Point-of-Care in Aboriginal Hands program, we were helping an Aboriginal health worker screen a young man in the service’s clinic. The man’s blood was left standing temporarily on the bench while we attended another client. When we returned, the red blood cells had begun to settle out, and the plasma was very milky. We explained to the health worker that this milky colour was due to fat in the plasma and that this fat could potentially deposit in a person’s arteries and cause a heart attack. This had been discussed previously in detail in an education session given to the health workers. However that instant visual image of the milky fat provided a stronger and more powerful message about heart disease than the ten minute talk I had given about the same topic.

Within an hour, everyone at the health service had seen that lipaemic sample and it was shown to every client in the waiting room with the explanation about how too much fat in the diet can make your blood go this colour and potentially kill you. The blood sample was later photographed and is still used to talk about heart disease.

It is important to be respectful of Aboriginal time, space and cultural priorities. Aboriginal people have a different concept of time to non-Aboriginal people. Their culture is based on time being circular (linking present experiences with their ancestral past), rather than linear (as non-Aboriginal people perceive it, for example, with the working day starting at a set time of 9 am and ending at another set time of 5 pm).

Even though an Aboriginal person may have a known serious health problem, that person may give other family-related issues a much higher priority than his/her own failing health. This is why it may sometimes be difficult for an Aboriginal person to keep to a health appointment or a follow up visit. Further, a community funeral assumes a very high priority. During two of our 24 field visits to Umoona (each a 20-hour, 1600-km round trip), a community funeral occurred on the day of our arrival. There was no-one in town. We accepted this as we understood and appreciated just how culturally important these sad events were for the community.

Even simple things are important. Casual jeans and an open-necked shirt are our standard uniform during
field visits. It is important to blend in rather than stand out in the community because we are coming to work on Aboriginal land and in their environment.

In the laboratory, expensive equipment, computers and other resources surround us and (generally, although perhaps not necessarily in this day and age) we have adequate staff numbers. As a non-Aboriginal health professional, it is important to understand and appreciate the extreme difficulties most Aboriginal health services (particularly those in rural and remote locations) have in relation to staff turnover, or access to even the most basic resources.

The best example I can give is to describe the working conditions at one of the sites in the QAAMS program. It is located in a very remote desert region of outback Australia and receives mail delivery by plane once a week. (The plane actually lands at the nearest town some 700 kilometres away and a service representative then collects the mail). The service experiences regular power fluctuations, is connected to the outside world by a satellite phone link that regularly breaks down stranding the service from outside communication for days at a time, and only one Aboriginal health worker is employed at the service. Despite these difficulties the service has maintained a 90% participation rate in the QAAMS program over three years and has regularly been ranked in the top 25% of services for its accuracy and precision base for HbA1c testing on the DCA 2000.

**Ethics**

Most clinically based health programs involving human subjects need institutional ethics approval before they can be conducted.

In Aboriginal health, there are additional ethical requirements. For example, in South Australia, there is an over-riding body called the Aboriginal Health Research Ethics Committee (AHREC) of South Australia. Every health project involving Aboriginal people must receive ethics clearance from this body before commencing.

**Grant writing – and the connection with time and resource management**

One of the conditions of my move from medical biochemistry to Aboriginal health was that the work would need to be funded entirely from external grants. So one could say, with good justification, that we have very much been living on the edge for survival.

One of the downsides of being successful in securing a grant, however, is that most granting bodies now have very rigid and frequent reporting deadlines.

There is a vicious cycle occurring here too. Spending 25-30% of my time writing grants means there is less time to spend actually doing the work. Productivity therefore suffers potentially. But you must continue to be productive, because when the time arrives to go back to funding bodies to seek the next extension of your grant, they want to know how productive you have already been.

With the way in which our workload has expanded over the past two years in particular, additional staff have been employed to maintain our productivity. Extra staff means further salary money is required and therefore extra grant writing ... and so the cycle continues.

**Financial management**

When I first started this work, a colleague told me: “you’ll be right, there’s plenty of money in Aboriginal health.” Yes, there is funding to support Aboriginal health – but, quite appropriately, funding bodies prefer to direct available funding to the Aboriginal community itself, rather than to non-Aboriginal, metropolitan-based health professionals.

A breakdown of the source of the funds we have been able to attract over the past 5 years is as follows: Commonwealth government 62%, State government 13%, Industry 19% and Private Enterprise 6%. The level of funding secured on a year-by-year basis since we started this work is thankfully trending upwards.

Our main budget lines are salary, travel, rent (for our new centre), quality assurance materials, information technology, and production of education and training materials. Around 5% of my time goes towards administration of these funds.

There is a hidden story in these figures, in that the flow of funds has tended to be very cyclical in nature.
Therefore it has been very important to have reserve funds in hand for the periods of drought, and this is where support from industry has been so vital.

We have been fortunate to be able to forge good collaborative working relationships with senior researchers in Aboriginal health, who have been at the forefront of research into Aboriginal renal disease and diabetes respectively for many years. There will be major opportunities to build on these collaborative links in the coming years.

**Publish or perish**

In the cut-throat world of research today, the philosophy of publish or perish is very strong, and researchers are often judged by the number of papers they write. However, when working in Aboriginal health, it is not just a matter of completing the work, writing it up and sending it off.

Permission to publish must be given by the Aboriginal community and/or the health service with which you have been working, while the manuscript must be reviewed and approved at the community level before sending it for publication.

With the Umoona Kidney Project for example, published papers or abstracts we have prepared have generally been co-authored by at least the Director of the Health Service, while Aboriginal health workers have been included regularly as co-authors.

One of the pleasing things about the projects that we have worked on is that we have been able to publish in a diverse range of journals - medical, scientific, nutrition and Aboriginal-based.

**Conclusion**

I would like to finish by briefly addressing several questions.

Has the vision of taking POC technology to the Aboriginal community worked? An independent report (Brice et al 2001) prepared on the first eighteen months of the QAAMS program by the National Aboriginal Community Controlled Health Organisation (NACCHO), the peak Aboriginal body representing the health of its people in Australia, concluded in its Executive Summary that:

- The use of [the DCA] POC technology presented a major opportunity to assist communities to better care for and manage Aboriginal clients with diabetes within the community setting
- The ability of the POC technology to generate rapid results served as a catalyst to enhance patient self-management
- The simplicity of use of [the DCA] POC technology generally led to high levels of acceptance by Aboriginal health workers nationally, with two-thirds of services expressing the view that it had raised the self-esteem of Aboriginal health workers in the community context
- The sense of community control was enhanced as a result of diabetic management becoming more focussed within Aboriginal medical services.

Finally, have we, as a group, been successful? As mentioned previously, success is not judged by western standards of number of publications, the volume of medical/scientific results or the complexity of statistical analyses. It is judged by how well your programs are accepted within and by the community, and it takes time and patience to establish yourself and your credentials.

I will conclude this article with a quote from the inaugural Director of the Umoona Tjutagku Health Service, who wrote to us in late 1998:

"The [renal] team has built up a feeling of trust amongst community members and has made many friends. The team's willingness to listen and involve the community has provided a good model for future projects."

**Acknowledgement**

I wish to acknowledge Barry Young from Servier Laboratories (Australia) Pty Ltd in Melbourne, who provided crucial start up assistance to our work in 1997.
References

+ Australian Red Cross
BLOOD SERVICE

Sharing life’s best gift

COURSE IN TRANSFUSION MEDICINE – 2003
“BLOOD – SAFETY AND SUFFICIENCY IN
A CLIMATE OF PUBLIC CONFIDENCE”
28 – 30 May 2003

Keynote Speaker
Dr Paul M. Ness, Professor Pathology and Medicine
The Johns Hopkins University, USA

Guest Faculty includes
Dr Che Kit Lin, Hospital Chief Executive
Hong Kong Red Cross Blood Transfusion Service

Venue
The Metcalfe Auditorium, The State Library of NSW, Macquarie St, SYDNEY

This Course will be of interest to all medical personnel who transfuse blood and of particular relevance to doctors, scientists and nurses who are involved in collecting, processing or use of blood and blood products. Academics and clinicians are as welcome as haematologists, pathologists, blood bankers, policy makers and industry.

Registration cost is $A506 (incl GST). This includes morning and afternoon tea, lunches, welcome reception and group dinner. For registration please contact:
Liz Beveridge, Course Coordinator, ARCBS-NSW
153 Clarence Street, Sydney NSW 2000
Tel: 02 9229 4375 Fax: 02 9229 4372 Email: ebeveridge@arcbs.redcross.org.au
AIMS National Office Bearers

National Executive
Mr Barry Gormley  President  bgormley@micronet.net.au
Mr John Lown  President-Elect  John.Lown@health.wa.gov.au
Mr David Nunn  Planning & Finance  spreyon@optusnet.com.au
Ms Jan Noble  Executive Officer  jnoble@aims.org.au

National Councillors
Mr Bob Dow  r.dow@qut.edu.au
Mr Richard Hanlon  richardh@dspl.com.au
Mr Alan Turner  alan.turner@rmit.edu.au
Mr Wayne Monaghan  Wayne_Monaghan@health.qld.gov.au
Mr Robert Partridge  Bob_Partridge@health.qld.gov.au
Mr John Stirling  John.Stirling@flinders.edu.au
Mr Sydney Yuen  Syuen@haem.rpa.cs.nsw.gov.au
Mr Bryan Day  B.Day@utas.edu.au
Mr Jeffrey Jago  j.jago@curtin.edu.au

National Office Administration
Ms Jan Noble  Executive Officer  aimsnat@aims.org.au
Mrs Norma Walsh  Office Administrator  jnoble@aims.org.au
Mrs Lesley Schneider  Administration  nwalsh@aims.org.au
lschneider@aims.org.au

Editors: Australian Journal of Medical Science
Mr John Stirling  ajims@aims.org.au
Assoc Prof Tony Woods  John.Stirling@flinders.edu.au

State Chairpersons
Mr Richard Hanlon  Tas  richardh@dspl.com.au
Mr Jeffrey Jago  WA  j.jago@curtin.edu.au
Mr Alan Turner  Vic  alan.turner@rmit.edu.au
Mr Robert Partridge  Qld  Bob_Partridge@health.qld.gov.au
Mr John Stirling  SA  John.Stirling@flinders.edu.au
Mr Sydney Yuen  NSW  Syuen@haem.rpa.cs.nsw.gov.au

Examinations Council
Mr Bryan Day  Biochemistry  B.Day@utas.edu.au
Chair, Membership Examinations  Wayne_Monaghan@health.qld.gov.au
Mr Wayne Monaghan  Microbiology  djcondie@health.qld.gov.au
Chair, Fellowship Examinations  bgormley@micronet.net.au
Mr David Condie  General  bshort@stvincents.com.au
Mr Barry Gormley  Histopathology  paul_shield@snp.com.au
Mr John Lown  Blood Transfusion  john.lown@health.wa.gov.au
Mr Robert Short  Haematology  rshort@stvincents.com.au
Dr Paul Shield  Cytology  paul_shield@snp.com.au
Prof Alan Cripps  Immunology

2 Australian Journal of Medical Science, February 2002, Vol. 23, No. 1